INTERNATIONAL AND INDIAN ACTIVITIES FOR URBAN MOBILITY

METRO NEWSLETTERS
Dec. 2018 - Jan. 2019

gathered by Dr. F. A. Wingler

METRO NEWSLETTERS
on
URBAN MOBILITY

PUBLIC MULTIMODAL URBAN, SUBURBAN AND INTERURBAN PASSENGER TRANSIT SYSTEMS WITH METRO-BUS, LIGHT-RAIL, METRO-RAIL, REGIONAL RAPID TRANSIT, COMMUTER-RAIL, TRAM-TRAIN, ROPE-WAY/TRAIN, WATER-METRO, AUTOMATED PEOPLE-MOVER

TRANSPORTATION AND ECONOMIC DEVELOPMENTS IN MODERN URBAN/MEGAPOLIS ENVIROMENT

METRO Newsletter by Dr. F.A. Wingler
METRO 01, December 2018

Alstom Rolling Stocks for Mumbai Metro Line 3; India

PART I: ACTIVITIES FOR URBAN MOBILITY SOLUTIONS IN INDIA

Mumbai Metro to Get Alstom Communication-Based Train Control, CBTC, Signalling System; India

10 Dec. 2018 | Railway News

The Mumbai Metro Rail Corporation Ltd has signed a contract with Alstom for its **CBTC** signalling system. The system is for the city's metro line 3. The contract is worth more than 100 million euros for Alstom. This new contract follows others signed earlier in 2018 for rolling stock and power supply on the same line.

Alstom to supply its Communicatio-Based Train Control, CBTC, Signalling System Urbalis 400 for Mumbai's Metro Sine 3 © Alstom

CBTC Signalling System – Alstom's Urbalis 400

Alstom will install its latest **CBTC Signalling** system, the **Urbalis 400**, on line 3 of the Mumbai metro. The contract includes a number of provisions. In particular, Alstom will be responsible for unmanned train operation, computer-based interlocking and centralised train supervision. Furthermore, Alstom will provide platform screen doors and the electrical and mechanical supervisory control and data acquisition system.

Alstom's Urbalis 400 signalling system helps to optimise performance and capacity. This is because the system features functions that improve headway and average speed performance. It will contribute to reducing congestion in Mumbai, particularly during rush hour. The system is currently in operation in more than 30 cities.

Alain Spohr, Alstom Managing Director India and South Asia, said:

“Alstom is extremely proud to have won three big contracts for Line 3 of Mumbai Metro, emerging as the partner of choice for this prestigious project. This major signalling contract confirms the trust our customer MMRCL has in us. This is an excellent opportunity for Alstom to showcase its breadth of expertise and reinforce our goal of being the preferred partner of cities, countries and operators as they face the rapidly evolving challenges of urban mobility.”

Alstom has previously provided its CBTC signalling system in the Indian cities of Kochi and Lucknow. Furthermore, the company says 25 percent of the world’s radio CBTC systems feature Alstom’s Urbalis solutions.

Alstom Wins Contract for 248 Cars for Mumbai Metro; India

11 Sep. 2018 | Railway News

Metro-Car Contract, Mumbai Metro Line 3 © Alstom Transport

Alstom Transport has won the contract to supply **248 metro cars** to the **Mumbai Metro Rail Corporation Ltd (MMRCL)**. The cars will provide services on the planned **Line 3** of the Mumbai Metro, which will connect the busiest regions of Mumbai. The contract is worth **approximately 315 million euros** for Alstom.

This order is the largest contract for rolling stock which Alstom has won in the urban sector of India’s rail industry. The manufacturer will **design, manufacture and deliver 31**

lightweight, fully-furnished 8-car passenger trainsets for Line 3. Alstom will **also train all of the operations and maintenance staff for the line**. The company won the contract to supply power and telecommunications system for the line earlier in 2018.

The metro cars will incorporate **75% motorisation**, in accordance with the guidelines stipulated by the Ministry of Housing and Urban Affairs in the Indian government. The motorisation will **improve the efficiency of the trains by facilitating the quick acceleration and deceleration** of the cars. The trains will be also equipped with **regenerative braking systems to reduce carbon emissions**.

The cars will be designed at Alstom's engineering centre in Bangalore, India, and manufactured at the company's rolling stock manufacturing unit at Sri City in Chennai, India.

Alain Spohr, Managing Director, Alstom India and South Asia, said:

"We are delighted to be the partner of choice for the prestigious Mumbai Metro Line 3 project. By providing reliable, advanced and competitive transportation solutions, we are committed to support our customer in easing Mumbai's transport challenges. With the project stipulating 75% manufacturing in India, this contract has further reinforced our commitment to invest, grow and Make in India."

Mumbai Metro – Line 3

Mumbai Metropolitan Region is one of the fastest-growing centres in India and **Line 3 will relieve the congested surface transport network**. The line will **connect Cuffe Parade business district in the extreme south of the city to the Santacruz Electronics Export Processing Zone (SEEPZ) in the north-central area**. The line will include **26 underground and one street-level station**. It will be the first underground metro line in Mumbai and one of the largest continuous underground lines in India. Line 3 will be the **first Unattended Train Operation (UTO) project in Mumbai** and the second in India after Delhi lines 7 and 8.

Alstom in India

In addition to this contract Alstom is delivering **several other metro projects in cities across India**, including Chennai, Kochi and Lucknow. The company is manufacturing rolling stock for these projects at its facility in Sri City. Alstom is also designing signalling and power-supply systems for a section of the Eastern Dedicated Freight Corridor, which is funded by the World Bank.

The company has recently completed phase 1 of the construction of a new electric-locomotive factory in Bihar. A depot in Saharanpur was also opened not long ago.

PART II: ACTIVITIES FOR URBAN MOBILITY SOLUTIONS INTERNATIONAL

Alstom delivers last of the 22 Sydney´s Metro Trains

07 Dec. 2018 | Railway News

Alstom has delivered the last of its 22 Metropolis trains for the Sydney Metro. The rolling stock manufacturer won the contract to manufacture the six-car trains in 2014. Alstom is also providing the **Urbalis CBTC Signalling** system for Sydney's North West Rail Link.

Delivery of the last of the 22 Sydney Metro trains celebrated with a flag-off ceremony © Alstom

Alstom held a flag-off ceremony at its Sricity facility in Andhra Pradesh, India, where the trains were produced. Ling Fang, Alstom Senior Vice President Asia Pacific, Alain Spohr, Managing Director India and South Asia, and Mark Coxon, Managing Director Australia and New Zealand all attended the event.

Specifications for the Sydney Metro Trains

The 22 trains will be comfortable and safe for passengers. For example, passengers will be able to walk through the entire length of the train. There is priority seating for passengers with reduced mobility. In addition, there is space for wheelchairs, bicycles, prams and luggage. Furthermore, the trains feature the latest passenger information systems.

Alstom Sricity Manufacturing Facility

Alstom employees in India started manufacturing the Sydney metro trains in 2014. The facility has a production capacity of 240 cars per year. Alstom is proud that this site has delivered the trains for this metro system on time.

Ling Fang said:

“We are immensely proud to have completed the last train for Sydney Metro in this landmark project for the Asia Pacific region. We are also proud to see Sricity concluding its first export order on time, delivering on expectations and winning our customer’s trust.”

Read: Alstom Appoints Ling Fang Senior Vice President of Asia Pacific Region

The Sydney Metro is Australia’s first fully automated metro network. Alstom’s Sricity facility will manufacture rolling stock for the Montreal and Mumbai metro systems in 2019.

Siemens Mobility Receives Order for 6 Additional G1 Metro Trains for Nuremberg; Germany

29 Nov. 2018 | Railway News

Siemens Mobility has received an order for 6 additional G1 metro trains for Nuremberg. VAG, Nuremberg’s public transport operator, placed the original order in December 2015. That contract contained two options for additional metro trains. VAG is now following through on one of these options, bringing the total number of G1 metro trains Siemens Mobility will be supplying up to 27. (The original order was for 21 trains.)

Siemens G1 Metro Train for Nuremberg © Siemens Mobility

These 6 four-car metro trains will run on Nuremberg’s U1 metro line starting in 2021. They will replace 12 two-car DT2 trains. Siemens Mobility will build the metro trains at its site in Vienna, Austria. Beneficially for Nuremberg, the city will manufacture a number of vehicle components such as drive converters, motors, auxiliary converters and control systems. Siemens employees in Erlangen meanwhile will handle the project management, development and service support.

Related Post: Alstom Delivers First Metropolis Trainset to Dubai Metro

Tim Dahlmann-Resing, VAG Executive Board Member responsible for Technology and Marketing, said:

“With the G1 train, we’ll clearly be launching a new era of underground operation. The trains not only look sleekly modern inside and out, but also meet all our expectations. We can carry more passengers, offer them greater comfort and also improve usability for people with reduced mobility. With this train running on the U1 line, we can tackle the next 40 years of metro operation.”

Sabrina Soussan, CEO of Siemens Mobility, said:

“The G1 is a highly advanced train that’s been designed specifically to meet the needs of Nuremberg. All trains can also be converted later to automated operation, making them future-proof over their entire lifecycle.”

© Siemens Mobility

Development of the G1 Metro Trains for Nueremberg

Siemens engineers focused on passenger comfort and improved passenger flows. The wider doors and the full-length accessibility enhance passenger access as well as distribution. From an aesthetic perspective the interior is bright and friendly.

The design intention has been to make passengers feel secure and not cramped. In addition, passengers benefit from up-to-date travel information displayed on a comprehensive passenger information system. The air-conditioning will make temperatures pleasant for passengers.

The engineers at Siemens have added safety features as well. There are LED lights above the door inside the train and on the door panel on the outside. A green light means ‘board now’, while a red light indicates ‘stop’. Flashing lights let passengers know the doors are moving and they should not board. Furthermore, the G1 metro trains feature automatic gap bridging at all the doors. This increases passenger safety while also improving passenger flow and allowing barrier-free access.

Siemens engineers have designed these metro trains for manual operation. However, they have also provided necessary installation spaces and interfaces so they can retrofit the necessary equipment for automated operation in the future. The driver's cabin would also be removed. The U1 underground line is Nuremberg's oldest and busiest.

Keolis preferred Operator for Danish Odense Light Rail Contract; Denmark

05 Dec. 2018 | Railway News

The Danish city of Odense is getting a second light rail line. The first phase is due to open in 2020. Odense Letbane has now selected French-Canadian public transport operator Keolis, which is majority-owned by SNCF, as the preferred bidder to operate the light rail line.

One of the Stadler Trams for the City of Aarhus, Denmark © Lav Ulv under licence

Details of the Danish Light Rail Contract

Keolis, via its subsidiary Keolis Odense Letbane, has been chosen as the preferred bidder to operate and maintain the city's light rail network. The contract covers 15 years and will generate an estimated 230 million euros in revenue. The city's public transport authority, Odense Letbane, should soon confirm its decision. The signing of the contract should then take place before the end of the year.

The light rail system in question will be 14.5 km in length and have 26 stations. The network will run north-south, connecting Tarup to Hjallese. The entire journey would take 42 minutes, traversing the city centre. In addition, the light rail system would service the central station and the city's university.

Stadler won the contract to supply the rolling stock. It will deliver 16 trams. Each one has a capacity of 210. Estimates suggest they will transport 12 million passengers per year. By providing additional public transport infrastructure in Denmark's third-largest city, the hope is that the population will choose to travel by public transport rather than by car.

Read: Stadler Secures Second Tram Contract in Denmark

Keolis in Denmark

Keolis won its first contract in the country in 2007. It is now present in more than ten cities where it operates around 500 buses. It also operates the light rail system in Aarhus, the first in the country. Incidentally, Stadler has also provided the rolling stock for this light rail network.

In total, Keolis operates 24 tram networks around the world.

Final Sydney Metro driverless Train completed; Australia

Dec. 7, 2018
Written by David Burroughs

THE last of 22 fully-automated Metropolis trains for Sydney Metro was rolled out at Alstom's Sricity facility in Andhra Pradesh, India, on December 6.

The flag-off ceremony at Sricity took place in the presence of Alstom senior vice president Asia Pacific, Mr Ling Fang, managing director India and South Asia, Mr Alain Spohr, and managing director Australia and New Zealand, Mr Mark Coxon.

Alstom was awarded a contract in 2014 to deliver 22 six-car trains and **the Communicatio-Based Train Control CBTC** system for the line which is currently under construction and due to open in the first half of 2019.

In July, Alstom was awarded a 15-year contract for the maintenance of rolling stock and signalling on the 36km line, Australia's first automated metro.

The Sricity facility, which began production in 2014, has an annual capacity of 240 cars and has delivered metro vehicles for the Indian cities of Chennai, Kochi and Lucknow. It will begin work on its second export order for the light metro project in Montreal from early 2019 while production for Mumbai Metro Line 3 will also begin next year.

The new trains feature three sets of double-doors per car, CCTV, emergency intercoms, the latest passenger wayfinding aids for customer information, and real-time travel information systems.

The Niagara Frontier Transit Authority secures FTA grant to study Metro Rail Expansion; eyes Terminal Redevelopment; Buffalo, USA

Written by Paul Conley, Editor-in-Chief

Buffalo's NGTA is looking to redevelop its historic DL&W Terminal
NGTA

The Niagara Frontier Transit Authority (NFTA) took two giant steps yesterday in its plans to make Buffalo a more transit-friendly city.

First, the NFTA announced that a proposal to expand light-rail service in Buffalo is getting a $778,000 boost from the federal government. NFTA said it will receive a grant of more than 3/4 of a million dollars from the Federal Transit Administration to study proposal to extend commuter service into the nearby community of Amherst, NY.

The NFTA and the Greater Buffalo Niagara Regional Transportation Council will use the cash to do planning work geared toward attracting private sector development and to maximize economic development opportunities, according to the Buffalo News. The proposed rail extension is part of a larger plant to build more walkable communities and denser development. Partners in the effort include Erie County, the City of Buffalo, Amherst, Town of Tonawanda and the University at Buffalo.

Also yesterday, the NFTA said it was seeking bids for a redevelopment of the of the historic DL&W Terminal on the Buffalo River, behind the Key Bank Center. The NFTA plans to continue to use the first floor of the terminal as a repair center and staging area for its Metro Rail cars, but hopes to convert the rest of the facility into a destination that would connect the Canalside neighborhood with the city's Cobblestone District.

The RFP says "respondents will set forth a comprehensive, compelling vision and plan to build out and manage mixed-use space using the second floor of the DL&W and possible future first-floor development/programming space that will maximize the economic vibrancy of the NFTA's Metro Rail corridor and the Canalside and Cobblestone districts," according Buffalo Business First.

News of the light-rail study and the DL&W redevelopment comes at a busy time for Buffalo rail. Just last week came news that Hohl Industrial Services Inc. and Scrufari Construction Co. won a $27.7 million design-and-build contract for an intermodal passenger transportation hub planned for downtown.

Categories: EOI/RFP/RFQ, Passenger, Rapid Transit/Light Rail
Tags: Buffalo, DL&W

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METRO Newsletter by Dr. F.A. Wingler
METRO 02, December 2018

Durham, North Carolina, LRV on dedicated Route; USA

ACTIVITIES FOR URBAN MOBILITY SOLUTIONS INTERNATIONAL

New York Subway to increase some Train Speeds; USA

Written by Paul Conley, Editor-in-Chief

December 10, 2018
C&S, Passenger, Rapid Transit/Light Rail, Safety/Training

A Signal Light at the Stillwell Avenue Platform in Brooklyn during the 2014 Snow Storm that hit the New York City Area; MTA | Patrick Cashin

The New York City Subway boosted speeds on two lines over the weekend and will increase speeds of other trains in the coming months, according to a story in *The New York Times*.

Sections of the N and R lines in Brooklyn saw train speeds rise from 15 miles an hour to as much as 30 miles an hour, the Times reported. The speed increases come as workers across the NYC subway system have begun replacing faulty signals that triggered train brakes at low speeds.

Slow moving trains are a constant headache for New York commuters. Rules imposed following a rear-end collision on the Williamsburg Bridge in 1995 led to new speed limits on the system. But Andy Byford, who became president of the New York Transit Authority in January told the *Times* those rules are stricter than needed. Today he is scheduled to outline his plan to boost speeds on multiple parts of the system to the Metropolitan Transportation Authority's board, which oversees the system, the Times reported.

A special "speed unit" rode every mile of the system over the summer and found numerous problems that, if fixed, would allow for faster trains. Among the more troubling items found by the three-person "speed unit" team were 267 faulty signals that forced operators to pass trains more slowly than needed.

A spokesperson for Transport Workers Union Local 100, which represents thousands of NYC subway workers, told the *Times* he was comfortable with the increased speeds ordered by Byford.

As Byford works to increase train speeds he'll have help from an old friend. Pete Tomlin, who worked with Byford on both the London Underground and Toronto Transit Commission, will take over as head of the agency's systemwide resignaling efforts in January 2019.

Categories: C&S, Passenger, Rapid Transit/Light Rail, Safety/Training

Construction of Montreal's REM light-Rail Stations begins; Canada

December 07, 2018
Bridge/Retaining Walls/Tunnels, Rapid Transit/Light Rail

Montreal's Réseau express métropolitain light-rail project (REM) has reached another milestone as work begins on the first of the system's 26 stations and elevated-track sections.

According to a report in the Montreal Gazette, work crews are clearing land adjacent to Highway 40 in the city's West Island where pillars will be installed along the former Doney Spur line to support the tracks. This Doney Spur line was acquired from CN in 2016.

The REM light-rail project is being developed by CDPQ Infra, a wholly owned subsidiary of Caisse de dépôt et placement du Québec, and consists of a 67-kilometer (41.63-mile) high-frequency network.

The start of work on the stations comes a little more than three months after the Canada Infrastructure Bank agreed to provide a CA$1.28-billion (US$980-million), 15-year loan to help fund the project. Total costs for the project ae expected to be approximately CA$6.3-billion (US$4.84-billion).

A consortium called the Groupe NouvLR won the infrastructure engineering, procurement and construction contract in February. The consortia includes SNC Lavalin Grands Projets Inc.; Dragados Canada Inc.; Groupe Aecon Québec Ltée; Pomerleau Inc.; and EBC Inc. NouvLR Conception participants include SNC Lavalin Inc. and Aecom Consultants Inc.

The rolling stock, systems, operation and maintenance contract was awarded to Groupe des Partenaires pour la Mobilité des Montréalais, which is comprised of Alstom Transport Canada Inc. and SNC-Lavalin O&M Inc.

Station architecture and design will come from a collaboration of Perkins+Will, Lemay, and Bisson Fortin, according to the Architect's Newspaper.

When complete, the REM light-rail system will connect the West Island with downtown Montreal, the South Shore, North Shore and Trudeau International Airport.

Categories: Bridge/Retaining Walls/Tunnels, Rapid Transit/Light Rail

Groundbreaking begins for Southwest Light Rail in Minneapolis; USA

December 03, 2018
Ballast, Ties, Rail, Bridge/Retaining Walls/Tunnels, Rapid Transit/Light Rail, Track Structure
Written by Paul Conley, Editor-in-Chief

Photo courtesy of Metropolitan Council

More than 10 years after it was proposed, construction work will begin on the Southwest Light Rail system. The 14.5-mile line will connect downtown Minneapolis to the suburb of Eden Prairie.

"Southwest LRT is becoming a reality," said Metropolitan Council Chair Alene Tchourumoff. "This project is the result of partnerships, at the federal, state, county, local and community level. Its planning alone has attracted millions of private economic development along the corridor, generating a return on investment before the first shovels even hit the ground. And once it's built, it will connect thousands of people across the region with jobs, education, opportunities and more."

For some time it appeared the system might not ever be built. The Federal Transit Administration (FTA) granted preliminary engineering approval in 2011. But in May 2016 a plan to fund the project with state funds was withdrawn. Lawsuits and concerns about environmental impacts also slowed the process.

But in November 2018, the FTA issued a "letter of no prejudice" for the project, effectively committing the federal government to covering nearly half of the estimated $2 billion to build the line.

Winning Bidders

Also in November, the Metropolitan Council awarded the construction contract for the system to a joint venture of Lunda Construction Co., based in Black River Falls, Wis., and C.S. McCrossan, based in Maple Grove, Minn. The joint venture won the contract with a $799 million bid.

Lunda and McCrossan will have to earn their money. The project promises to be a complicated one, requiring coordination with both the Twin Cities & Western Railroad and BNSF Railway while building an extensive array of structures, including

- 29 new bridges (LRT, pedestrian, freight and roadway)
- Seven existing bridges to be modified
- Six pedestrian tunnels
- Two "cut-and-cover" LRT tunnels, a 582-foot tunnel under state Highway 62 on the Minnetonka-Eden Prairie border and a 2,236-foot tunnel in the Kenilworth corridor of Minneapolis
- Over 100 retaining walls

Early construction activities this winter could include staffing and equipment mobilization, site clearance, demolition and utility work, according to the Metro Council. Heavy construction would occur in 2019-2022, with testing of the system with new light rail vehicles anticipated in 2022-2023. Passenger service is expected to launch in 2023 as an extension of the METRO Green Line.

BART proposes second SF Bay Tunnel; USA

November 21, 2018
Bridge/Retaining Walls/Tunnels, News, Passenger, Rapid Transit/Light Rail
Written by Keith Barrow, International Railway Journal

Wikipedia/Pi.1415926535

Proposals for a second rail tunnel beneath San Francisco Bay were discussed at a meeting of the Bay Area Rapid Transit (BART) board of directors on Nov. 15.

Construction of the Second Transbay Rail Crossing could begin within a decade and the project would relieve the existing tunnel between Oakland and San Francisco, which opened in the 1970s.

According to a recent study by the Bay Area Rapid Transportation Commission, the population of the Bay Area, Sacramento, Santa Cruz, Monterey and San Joaquin counties will increase by 4 million by 2040, with around 300,000 new jobs being created in San Francisco.

Currently around 45,000 passengers per hour cross the bay during peak period and demand for Transbay transit is forecast to outstrip capacity by 2040, despite BART's plans to upgrade the existing tunnel.

BART says a second crossing would help to connect the Bay Area's strong economy with projected housing growth in Sacramento and the Central Valley while supporting economic development in the northern San Joaquin Valley and Sacramento.

BART says the project would leverage Caltrain modernization, California high-speed rail and other investments in the state's rail network, providing "seamless connections" between BART and other rail systems. The second crossing would increase operational and maintenance flexibility and could facilitate the introduction of 24-hour operation.

In the short-term, BART plans to award a contract for an economic impact assessment and a request for proposals will be issued this month for a contract to provide strategic advisory and program management services. The contract is due to be awarded by mid-2019 and the winning bidder will carry out a feasibility study to narrow alternatives for the second crossing to a shortlist of between two and four options.

Bridge Installation moves CTA 95th/Dan Ryan Terminal Improvement Project forward; Chicago, USA

November 19, 2018
Bridge/Retaining Walls/Tunnels, Commuter/Regional, News, OFF Track Maintenance, Passenger, Rapid Transit/Light Rail
Written by Kyra Senese, managing editor

The 95th/Dan Ryan Terminal of the Chicago Transit Rendering courtesy of CTA

The 95th/Dan Ryan Terminal, one of the Chicago Transit Authority's (CTA) largest station improvement projects, has moved closer to completion with the installation of a steel pedestrian bridge connecting the North and South Terminals of the station during the weekend.

Officials said the installation of the one-of-a-kind pedestrian bridge was expected to be a complicated process, with nearby cross streets closed to all pedestrian and vehicular traffic during a significant portion of the weekend to allow for the work.

The bridge spans 150 feet across 95th Street, linking the north and south terminals of the 95th/Dan Ryan station to unite the entire structure.

On Nov. 18, construction experts used two large cranes to lift the pedestrian bridge into the air and connect it to facility's the North and South terminals.

Due to the complexity and challenges of lifting such a large structure into place, CTA said the pedestrian bridge was installed in three large sections, with each portion weighing more than 73,000 pounds.

Categories: Bridge/Retaining Walls/Tunnels, Commuter/Regional, News, OFF Track Maintenance, Passenger, Rapid Transit/Light Rail

Durham Pols approve Light-Rail Maintenance Facility; North Carolina, USA

Written by Paul Conley, Editor-in-Chief

Durham Orange LRT rendering GoTriangle

The Durham, NC, city council gave unanimous approval Monday to a proposal to rezone a piece of land in the southwest corner of the city for a light-rail operations and maintenance facility.

The vote moves the controversial Durham-Orange Light Rail Transit a step closer to reality. But problems remain. Some key players in Durham's economy — including Duke

University, the Durham Performing Arts Center and the Durham Bulls Athletic Park — have voiced opposition to all or parts of the planned streetcar system.

Under the plan approved Monday, a facility would be built along Farrington Road to house administration offices, rail car maintenance and storage space. The Research Triangle Regional Public Transportation Authority, known as GoTriangle, chose the location over four others after a series of public meetings in 2015, according to the *Herald Sun* newspaper.

Before Monday's vote, 52 people spoke before the city council in opposition to the operations and maintenance facility. Nearby residents have raised concerns about noise levels.

If the light-rail project keeps to schedule, construction will begin in 2020, with estimated completion in 2028. The proposed line would run 18 miles from UNC Hospitals in the west to the campus of North Carolina Central University in the east, with 12 proposed stops along the way. Total cost of the project is estimated to be $2.48 billion. The alignment for the new line will span 16 bridge structures, accounting for more than three miles of track.

In August 2017, GoTriangle chose Omaha-based HDR to lead final design and project management of the system. HDR Transit will design all of the bridges and will lead engineering and architecture for infrastructure along the entire alignment, which includes 18 stations, a parking garage and the maintenance facility. In addition, HDR is leading track design, traffic management, utility relocation, site planning and roadway design. HDR also performed environmental studies and geotechnical engineering in earlier phases of this project.

But keeping to that schedule may prove difficult. The proposed line would cross the campus of Duke University. But the school has so far declined to donate the land needed for the streetcar tracks.

At press time, neither Duke nor HDR had responded to requests from *RT&S* for comment.

Valley LRV Metro CIG Grant fully funded; Arizona, USA

November 30, 2018
Commuter/Regional, OFF Track Maintenance, Rapid Transit/Light Rail
Written by Kyra Senese, managing editor

Image courtesy of Valley Metro

Valley Metro, in partnership with the city of Tempe, Ariz., has received the full $75 million in funds allocated through the Federal Transit Administration's (FTA) Capital Investment Grants (CIG) in support of the Tempe Streetcar project.

The transportation authority's project received $50 million from the FTA in 2017. With the approval of the final $25 million grant installment, the project will move forward with a fully funded grant, officials said.

"These significant investments in the public transit systems in five communities across the country will improve mobility for riders who depend upon public transit every day," said U.S. Transportation Secretary Elaine L. Chao.

The CIG Program provides funding for major transit infrastructure capital investments throughout the U.S. Officials said projects that gain acceptance into the program are required to go through a multi-year, multi-step process to be considered as a funding recipient.

Tempe Mayor Mark Mitchell explained that he believes the Tempe Streetcar is essential to the growing city's success.

"[The] announcement shows we have a strong project with federal, community and regional support," Mitchell said.

The Tempe Streetcar is a three-mile route that stretches along Mill and Ash avenues, Rio Salado Parkway and Apache Boulevard, connecting to the current light-rail system and taking riders to neighborhoods, business centers and event destinations.

"I want to thank Secretary Elaine Chao and FTA Acting Administrator K. Jane Williams for their partnership in advancing the Tempe Streetcar," said Valley Metro CEO Scott Smith. "This transformative project will benefit all of Tempe – businesses, students and residents alike through advanced mobility and the creation of jobs."

Tempe Streetcar is currently undergoing construction work and is set to open in 2021.

Puget-Sound LRV Transit celebrates groundbreaking for Hilltop Tacoma Link Extension; USA

November 20, 2018
Commuter/Regional, News, OFF Track Maintenance, Passenger, Rapid Transit/Light Rail
Written by Kyra Senese, Managing editor

Image courtesy of Sound Transit

The Central Puget Sound Regional Transit Authority (Sound Transit) has started the construction of its 2.4-mile Hilltop Tacoma Link Extension, which will extend the current rail line from the Theatre District in downtown Tacoma to the Stadium District and Hilltop neighborhoods, according to a Nov. 19 announcement.

The project scope entails relocating the Theatre District station and building six new stations along the new line.

An event hosted at People's Park in downtown Tacoma, Wash., celebrated the public transit agency's partnership with the city of Tacoma and the Federal Transit Administration (FTA) to build the extension.

"Years of thoughtful planning and collaboration between community, state, and federal leaders to connect downtown Tacoma with the historic Stadium and Hilltop neighborhoods helped lay the tracks for today's groundbreaking, and I am thrilled to see the results of our hard work to expand affordable public transit options for local residents, students, and commuters," said U.S. Senator Patty Murray, a senior member of the Senate Appropriations Committee.

Murray said she was proud to secure federal investments for the project, which she said she believes will help increase mobility, create jobs and establish new opportunities for economic growth.

“I will keep working with Sound Transit, the city of Tacoma and other community leaders to see this vital project through to its completion,” she added.

Remarks were given by Murray, Victoria Woodards, Tacoma Mayor and Sound Transit board member, Mark Martinez, executive secretary, Pierce County Buildings and Construction Trades Council; Brendan Nelson, executive director, Hilltop Action Coalition; Denny Faker, owner, North Slope Coffee House, Rep. Derek Kilmer and Sound Transit CEO Peter Rogoff, a release said.

“Hilltop Tacoma Link provides additional access to our downtown corridor and will help fuel our economic growth,” Woodards said. “This groundbreaking event today would not have been possible without the support of Sen. Murray, Rep. Kilmer and our partnership with the Federal Transit Administration. Our city is poised to grow by 64 percent in the next 20 years and expanding Tacoma Link will connect residents to our regional transit system for years to come.”

Sound Transit selected Walsh Construction Company II, LLC to build the Hilltop Tacoma Link Extension and construct the new platform stations that are required by the project scope.

The $217 million project expands the existing Tacoma Link rail line up Stadium Way, 1st Street, Division Avenue and down Martin Luther King Jr. Way to South 19th Street.

The project has received funding through a partnership between Sound Transit, the city of Tacoma, a $75 million federal Small Starts grant and, with support from Murray, officials note that the project also received $15 million in federal funds from the Transportation Investment Generating Economic Recovery (TIGER) grant.

Service on the new extension is set to kick off in 2022, and Sound Transit said a future voter-approved extension of Tacoma Link is also expected to extend the neighborhood-scale service to Tacoma Community College by 2039.

MARTA taps Rail-Works to perform Rail Upgrades; Atlanta, USA

November 20, 2018 News, ON Track Maintenance, Rapid Transit/Light Rail, Supplier News
Written by Kyra Senese, Managing Editor

The Metropolitan Atlanta Rapid Transit File photo

The Metropolitan Atlanta Rapid Transit Authority (MARTA) has awarded RailWorks Corp., a provider of rail track construction and maintenance services, with a seven-year, $133 million contract to carry out upgrades along MARTA's network.

The contract mandates that RailWorks will perform track improvements throughout the MARTA network, such as carrying out tie replacement work, running rail and direct fixation fasteners. RailWorks will also be expected to perform yard improvements, officials said.

“Our work with MARTA is a partnership in the truest sense of the word,” said Kevin Riddett, CEO of RailWorks. “MARTA is committed to providing safe and effective transport to its customers, and RailWorks is here to support those goals with this safe and successful project that will keep MARTA's system among the most innovative in the country.”

RailWorks officials said work on the project is expected to begin in spring of 2019, with a final completion date anticipated in 2025.

Kawasaki mulls Future of Railcar Business

- November 07, 2018
- Passenger, Rapid Transit/Light Rail

Written by Stuart Chirls, Senior Editor, Railway Age

WMATA’s 7000-series cars, built by Kawasaki Rail Car USA. Wikipedia/Elvert Barnes

Kawasaki Heavy Industries, builder of subway cars for U.S. cities including New York and Washington, may exit the business amid mounting losses and an increasingly difficult market.

Kawasaki Chief Executive Yoshinori Kanehana, after announcing disappointing quarterly results, said the Japanese company is reviewing options for its rolling stock division, including getting out of the business, according to published reports.

The builder would explore alliances or possibly closing its rail unit if a turnaround isn’t successful.

Kawasaki plans to outline a restructuring for the rail business this fiscal year after announcing a net loss of $31 million for the six months ended September, down from a profit of $95 million a year ago. That included a reported loss of $78 million in its rolling stock division, primarily on contracts with Washington’s Metro and the Metropolitan Transportation Authority’s Long Island Rail Road.

The company operates Kawasaki Rail Car at U.S. facilities in Lincoln, Neb., and Yonkers, N.Y.

Kanehana also said that a labor shortage and Buy American requirements complicated the company’s business plans in North America.

Following early design issues and delivery delays, Metro inspections earlier this year found flaws that will require replacement of all wiring in 548 of about 600 new 7000 series cars. The agency has a $2-billion contract with Kawasaki for a total 748 cars, all of which it expects to be delivered ahead of schedule by late 2019.

Profits were also dragged by additional orders in a 2013 contract with LIRR that were less than expected.

NVTC releases first Report on WMATA Performance; Nothern Viginia, USA

November 02, 2018
Commuter/Regional, News, OFF Track Maintenance, Passenger, Safety/Training

Written by Kyra Senese, Managing Editor

Photo: WMATA

The Northern Virginia Transportation Commission (NVTC) has submitted its first legislatively mandated annual "Report on the Performance and Condition of the Washington Metropolitan Area Transit Authority" (WMATA) to Virginia's Governor and General Assembly.

The report is due on Nov. 1 each year and presents data that officials said will be key to understanding how Metrorail is performing. The report is also intended to outline the commission's priorities for managing WMATA's operating costs.

"This report, the first of many, will serve as a baseline for future years," said NVTC Chairman Paul Smedberg. "It will allow us, as we continue to track data, to paint a picture of improvements over time. The report is also a vehicle through which NVTC and its jurisdictions will share strategies that WMATA can use to manage costs and make its operations more efficient."

Twenty-two short- and long-term strategies are included in the report that have been designed to minimize WMATA's costs and to improve its operational efficiency. The NVTC said it created the strategies in coordination with its local jurisdictions, which are responsible for funding WMATA.

Upon implementation, officials said the strategies would help WMATA boost rail ridership, improve efficiency, control costs for labor and contracted services, enhance revenue collection, increase non-fare revenues and improve the efficiency of the workforce and contractors.

The NVTC has long been tasked with the funding of WMATA, officials note its responsibilities increased in 2018 with the passage of Virginia's omnibus transit bill, which states that NVTC report on safety and reliability, financial performance and ridership.

As the transit agency begins to receive funds in the future from the recently-established Washington Metropolitan Area Transit Authority Capital Fund, the NVTC is expected to report on their usage to improve the safety and reliability of Metrorail.

"NVTC recognizes the importance of the commonwealth's investment in WMATA and will continue to serve as a steward of its funds," Smedberg said. "Future reports will detail WMATA's expenditures as well as its efforts to restore riders' confidence in Metrorail through improvements in safety and reliability."

October 30, 2018
Commuter/Regional, OFF Track Maintenance, Passenger, Rapid Transit/Light Rail

WMATA CEO proposes expanded Service, no Fare Hikes for FY2020; Washington, USA

October 30, 2018
Commuter/Regional, OFF Track Maintenance, Passenger, Rapid Transit/Light Rail

Written by Stuart Chirls, Senior Editor, Railway Age

File photo

Washington Metropolitan Area Transit Authority (WMATA) system wants to hold the line on fare hikes while proposing expanded rail service as part of a fiscal 2020 budget proposal.

WMATA General Manager and Chief Executive Paul J. Wiedefeld will recommend to the WMATA Board of Directors this week a fiscal 2020 operating budget that does not raise fares, lowers the cost of weekend travel and increases rail service.

Wiedefeld's recommendations also include expanding rush-hours to provide more frequent rail service later in the morning and evening; a flat $2 fare for all weekend WMATA trips; doubling rush hour service at some stations on the Yellow and Red lines, and standardizing on eight cars for all trains.

The agency already plans to eliminate December 17 the "Grosvenor Turnback," which will double rush-hour service at four Red Line stations and was approved by the Board earlier this year, along with a separate recommendation to improve WMATA's "Rush Hour Promise" by crediting customers for unscheduled delays of 10 minutes or more, rather than 15 minutes today, and other customer-centric initiatives such as contactless smartphone fare payment.

"The past year has been about demonstrating to customers that we are getting WMATA 'back to good,'" said Wiedefeld. "Now, we have to get better than good as we work to attract and retain customers. While there are a number of improvements such as pass discounts and automatic train operations that we can do within the new cap on subsidy growth, the service improvements I am including in this budget will need the region's support and the Board's approval."

The proposal will be discussed at WMATA's Board of Directors' Finance Committee meeting this week, as well as how to fund new services outside the mandated 3% subsidy growth cap, and the recommendation to not raise fares or cut service. The Board includes voting members from the District of Columbia, Virginia, Maryland and the federal government, which together fund the system.

"Thanks to regional leadership that created a dedicated source of funding for safety and reliability capital investments, the Board can now turn to the question of what additional WMATA service the region can afford to operate," Board Chairman Jack Evans said. "There is no question that we need to improve service levels to rebuild ridership, and we need to consider how to do it without raising fares, which has the effect of discouraging people from riding."

The proposals include extending Yellow Line service to Greenbelt, Md., from the current "turnbacks" at Mt. Vernon Square during rush hours and at Fort Totten at all other times. This would double service during rush hours and address crowding at nine stations north of Mt. Vernon Square.

The budget recommends that all trains be increased to their maximum length of eight cars to increase capacity and reduce crowding. The move would also allow WMATA to simplify yard and maintenance operations by standardizing trainsets.

WMATA said the proposed budget meets subsidy cap restrictions put in place by dedicated funding legislation in Maryland and Virginia. The proposed service improvements will need to be considered by the Board as a policy decision to receive funding above the cap.

WMATA’s FY20 capital and operating budgets take effect July 1, 2019.

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METRO 03, December 2018

Hamburg Metro Train (Hochbahn) on elevated Structure; Germany

PART I: ACTIVITIES FOR URBAN MOBILITY SOLUTIONS IN INDIA

Noida Metro Aqua Line Phase 2 approved; India

Dec. 6, 2018
Written by Keith Barrow

THE Government of the Indian state of Uttar Pradesh has approved the second phase of the Noida metro Aqua Line, which will extend services southeast from Noida Sector 71 to Knowledge Park 5 in Greater Noida.

The 15 km Extension will add nine Stations to the Aqua Line.

The project will be implemented by Noida Metro Rail Corporation (NMRC) and the Uttar Pradesh government says it expects the 7km five-station Noida Sector 71 – Greater Noida Sector 2 section to open by the end of 2020. The remainder of the second phase is due to be completed by March 2021.

The initial 29.7 km section of the Aqua Line from Sector 71 to Depot Station is expected to open later this month.

Categories: AsiaMetrosNews Tags: IndiaNoida

CRRC Dalian rolls out first Train for Nagpur Metro; India

Nov. 28, 2018
Written by David Burroughs

CRRC Dalian completed the first three-car metro train for India’s Nagpur Metro on November 22.

Maharashtra Metro Company tendered the contract for the design, production, supply and commissioning of 23 trains in January 2016, along with training and a 10-year maintenance contract, and awarded the contract to CRRC Dalian in October 2016, with contract signing on March 29 2017.

The vehicles will operate on the north – south and east – west lines. The 38.2km network, which is electrified at 25kV ac, serves 36 stations, 34 of which are elevated.

The trains, which have a maximum design speed of 80km/h, have a stainless steel body with a maximum axleload of 16 tonnes and capacity for 974 passengers.

Categories: AsiaMetrosNews Tags: CRRC DalianIndiaNagpur metro

PART II: ACTIVITIES FOR URBAN MOBILITY SOLUTIONS INTERNATIONAL

NJ Transit plans double-Deck Train order as Positive Train Control, PTC, rollout Progresses; New Jersy, USA

Dec .10, 2018
Written by William Vantuono

NEW Jersey Transit (NJ Transit) has confirmed that it is preparing to purchase 113 new double-deck commuter rail vehicles to modernise its ageing train fleet.

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Second generation Avenio LRVs enter service in Munich

Dec 11, 2018 | Fleet

An industry source told IRJ's US sister publication *Railway Age* that the order will comprise self-powered electric vehicles, each hauling two or three double-deck trailers, with an existing unpowered driving car at each end of the train.

They will not be configured as traditional EMU powered/non-powered married pairs, and as such will be the first of their type in North America.

The long-term plan is to replace NJ Transit's ageing Arrow III EMUs, which were introduced in 1977, as well as its Comet II-V single-deck locomotive-hauled coaches.

If all options are exercised, nearly 1000 vehicles could be ordered.

In December 2017 NJ Transit opted to exercise a $US 184.5m option with Bombardier for 17 additional ALP45-DP electro-diesel locomotives.

PTC progress

NJ Transit also confirmed on December 5 that work to meet an interim deadline for the rollout of **Positive Train Control (PTC)** is "95% complete.".

NJ Transit has been identified by the Federal Railroad Administration as one of several passenger operators "at risk" of not meeting the statutory interim deadline for PTC implementation and qualifying for an alternative schedule with an absolute deadline of December 31 2020.

In January, NJ Transit had completed just 12% of its PTC programme.

Categories: Commuter RailFleetNorth America ; Tags: New JerseyNew Jersey TransitPTCUSA

Hamburg U-Bahn Line U4 Extension opens; Germany

Dec. 12, 2018
Written by David Burroughs

THE 1.3k m southern extension of Hamburg U-Bahn Line U4 from HafenCity University to Elbe Bridges opened on December 6.

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The line and station were opened by Mayor of the Free and Hanseatic City of Hamburg, Dr Peter Tschentscher, parliamentary state secretary in the Federal Ministry of Transport, Mr Enak Ferlemann, and Mr Henrik Falk, CEO of U-Bahn operator Hamburger Hochbahn.

Project participants were joined by around 200 guests from politics, businesses and the media for the maiden journey along the line.

Following the opening of the Elbbrücken station on the S3/S31 S-Bahn line, the two stations will be connected by a 9m-high "Skywalk," providing an alternative route into the city centre and relieving pressure on Hamburg main station.

The line provides a connection to the growing HafenCity district, where the first skyscraper in Hamburg is due to be built within the next decade alongside apartments, offices and hotels. An estimated 18,000 passengers are expected to use the new line daily following the full development of the area.

The extension begins underground at HafenCity University before reaching the surface and curving into Elbbrücken station, which is aligned north-south to allow a future extension to the Kleine Grasbrook district.

The roof of the station, which is up to 16m-high, is made up of intersecting arched steel frames and glazed windows that are 136m-long and 32m-wide. The 1200 glass sheets each weighing 250kg produce a total weight of around 300 tonnes. Free rides were offered on the line for the first three days of operation, accompanied with a light show in the evening to highlight the station's architecture.

The 4km section of U4 from Jungfernstieg to HafenCity University was opened in November 2012.

For detailed data on metro projects around the globe, subscribe to IRJ Pro.

Categories: EuropeMetrosNews
Tags: GermanyHamburgHamburger Hochbahn

Hamburger Hochbahn orders additional DT5 Metro Trains; Germany

Dec. 11, 2018
Written by David Burroughs

HAMBURG U-Bahn Operator Hamburger Hochbahn has ordered 13 additional DT5 trains from a consortium of Alstom and Bombardier.

95 DT5 Hamburg Metro Trains are already in Service.

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Dec 12, 2018 | Main line

As part of the contract, Alstom will deliver the mechanical components, including the bogies and the braking system, while Bombardier will supply electrical and traction equipment, the passenger information system and the control system.

Assembly will take place at Alstom's site in Salzgitter, Germany.

The option will increase the number of DT5s on order from 118 to 131, of which 95 are already in service on the Hamburg U-Bahn. The overall Hamburg U-Bahn fleet comprises more than 250 vehicles.

Alstom's share of the contract amounts to more than €40m. The new trains are scheduled to enter service in December 2020.

The 40 m-long, three-car trains have capacity for 336 passengers, including 96 seated, as well as two wheelchair spaces. They are also equipped with air conditioning, passenger information systems and video surveillance as well as automatic door closing.

For more information on fleet orders around the world, subscribe to IRJ Pro.

Categories: EuropeFleetMetrosNews
Tags: AlstomBombardierHamburgHamburger Hochbahn

Metro Medellin selects CAF for EMU Refurbishment; Colombia

Dec. 7, 2018
Written by David Burroughs

THE City of Medellín has awarded CAF a contract to refurbish 42 three-car EMUs manufactured in the 1990s and currently operating on the Colombian city's metro network.

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The contract, worth approximately €80m, includes the modernisation and upgrading of the structure as well as the interior and exterior livery, and the replacement or retrofitting traction systems, auxiliary equipment, brakes, lighting and other equipment.

The 30km Medellín metro network, opened in 1995, is the only one in the country and consists of two lines and 27 stations. CAF has supplied 36 trains for the network since 2011.

Categories: Central/South AmericaMetrosNews
Tags: CAFColumbiaMedellin

Thai Prime Minister opens Bangkok Skytrain Extension; Thailand

Dec. 7, 2018
Written by Keith Barrow

THAILAND's prime minister Mr Prayut Chan-o-cha inaugurated the 12.8km southern extension of the Bangkok Skytrain Sukhumvit Line (Green Line) from Samrong to Kheha in Samut Prakan on December 6.

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Dec 7, 2018 | Metros

Travel on the eight station extension will be free-of-charge until April, when the initial section of the 18.4 km Mo Chit – Khu Kot extension is due to open.

The journey time from Samrong to Kheha is 13 minutes.

Siemens and Turkish partner Bozankaya are supplying 22 four-car trains for the extension of the Sukhumvit Line under a contract awarded in May 2016. Siemens will be responsible for maintaining the fleet for 16 years and a new depot has been built on the extension at Muang in Samut Prakan.

Categories: AsiaMetros

Seoul Metro Line 9 Extension opens; South Korea

Dec. 4, 2018
Written by Andy Tebay

ANOTHER eight stations were added to Korea's first privately-operated metro line on December 1 with the opening of the eastern extension from Sports Complex to VHS Medical Center.

Construction on the 9.2 km extension began at the end of 2009 and gives Line 9 passengers new interchanges with lines 2, 5 and 8.

The completion of the project reduces the journey time between Gimpo Airport and Olympic Park from 72 minutes to 50 minutes, and takes the total length of Line 9 to 40.9 km with 38 stations.

The line now plays a central role in moving commuters across major areas of southern Seoul. However, despite the opening of the extension Line 9, will continue to operate with the same number of trains and minimum headways have therefore been increased by 40 seconds. The increase in waiting times has generated concern among passengers as the line has already earned itself a reputation for long waits and overcrowding, with an extra 145,000 passengers reported to be using the line every day.

A shortage of rolling stock has continued to put pressure on the line since the opening of the Sinnonhyeon – Sports Complex extension in March 2015. While Line 9 still uses four-car trains, six-car sets have been introduced on express services to reduce congestion.

According to the city, further rolling stock will be added in 2019 to create more six-car car sets while it expects to order three new sets.

A further 3.8 km extension is planned and scheduled to open in 2027.

Line 9 was constructed by Seoul Metro Line 9 Corporation, which is owned by a group of insurance companies and banks, under a 30-year concession. The line is operated by

Seoul Line 9 Operation Company, a joint venture of Transdev and Paris Transport Authority (RATP).

For detailed data on metro projects in Asia, subscribe to IRJ Pro.

Categories: AsiaMetrosNews
Tags: KoreaSeoul

Surrey Light Rail Project suspended in favour of Vancouver SkyTrain Extension; Vancouver, Canada

Dec. 3, 2018
Written by David Burroughs

THE Translink Mayors' Council, which oversees Metro Vancouver's public transport operator, has voted to suspend the $C 1.65bn ($US 1.2bn) development of a light rail network in Surrey, the second-largest city in the Canadian province of British Columbia, instead favouring the extension of Vancouver's SkyTrain automated metro network through the city which is expected to cost up to $C 2.9bn.

The light rail network would have linked Guildford with central Surrey and Newtown.

The development of the light rail network linking Guildford with central Surrey and Newtown began in 2014 when Surrey's then mayor, Mrs Linda Hepner, promised to build city's first light rail line within four years.

However, Surrey council, led by the newly-elected mayor, Mr Doug McCallum, voted on November 6 to ask the Translink Mayors' council to cancel the light rail project and instead extend SkyTrain along Fraser Highway towards Langley.

A report to the Mayors' council said $C 77m has already been spent on planning and pre-construction works for the light rail project. According to the report, additional costs would be minimal if the project is restarted within four to six months, but a new business case would have to be completed if it is suspended for longer than that.

TransLink halted work on the project on November 6 following the Surrey council's decision, in order to avoid additional expenditure.

At a meeting on November 15, Translink Mayors' council agreed unanimously to suspend the light rail project indefinitely and directed council staff to develop a report on how the SkyTrain project could be implemented.

Categories: Light RailMetrosNewsNorth America

Tags: CanadaVancouver

Guiyang inaugurates second Phase of Metro Line 1; China

Dec. 3, 2018
Written by Keith Barrow

GUIYANG, the capital of China's southwestern Guizhou province, almost tripled the length of its first metro line on December 1 with the inauguration of the 22.3km second phase of Line 1 from Guiyang North station to Xiaomeng Industrial Park south of the city.

The extension runs underground for most of its length and adds 14 stations to Line 1.

The line is equipped with 1.5kV dc overhead electrification and services are operated by a fleet of six-car type B metro trains supplied by CRRC Nanjing Puzhen.

The initial 12.8km 10-station section of Line 1 from Xiamaixi to Guiyang North station opened in December 2017.

Construction began on the first phase of Line 2 in September 2015 and on the second phase of the project in February 2017. The 26.7km Phase 1 is due to open in 2020, while

Categories: Asia Metros News

GVB Amsterdam signs Metro Train Contract with CAF; Netherlands

Nov. 28, 2018
Written by Quintus Vosman

AMSTERDAM Municipal Transport (GVB) signed a contract with CAF on November 28 for 30 Inneo metro trains, with an option for 30 additional sets.

CAF was selected as preferred bidder for the contract in April, but contract signing was delayed due to an appeal by the second-place bidder, which was subsequently retracted.

The first trains, which will be classified as type M7 by GVB, are due to enter service in 2021 and the introduction of the fleet will enable the withdrawal of 1990s-built type M4, S3 and S2 stock in 2024-2027.

The option for 30 additional trains would be used to expand the fleet to help GVB cope with the continuing increase in ridership on the metro network.

Each 59.6 m-long train will be formed of two powered driving cars and an unpowered intermediate trailer, although the train will be designed for the addition of up to three extra vehicles. The height of the floor is 1100 mm while the width is 3005 mm.

The aluminium-bodied trains will be designed for multiple operation, although GVB envisages single operation during off- peak hours. The trains feature longitudinal seating throughout with two-multifunctional spaces in each set.

The fleet will run on the metro’s 750V DC third-rail system during normal operation, but the trains will be equipped with an auxiliary pantograph for movement around depots.

The trains will be used on lines 50, 53 and 54.

.Categories: MetrosNews   Tags: CAF< AmsterdamGVB

More Siemens Trains for Nuremberg U-Bahn; Germany

Nov. 27, 2018
Written by David Burroughs

NUREMBERG Transport Company (VAG) has exercised an option from its December 2015 contract with Siemens for six more G1 metro trains in addition to the 21 it had previously ordered.

The first painted car body from the original contract was completed in April.

The four-car G1 trains will replace 12 type DT2 two-car trains on Line U1 from 2021.

The trains will be built at Siemens Mobility's Simmering plant in Vienna, Austria, while various vehicle components such as drive converters, motors, auxiliary converters and control systems, will be manufactured in Nuremberg. Project management, development and service support will be handled in Erlangen.

The trains will feature wider doors, full-width open gangway, multi-function areas, passenger information systems and air-conditioning. LED lights above the door inside and on the door panel outside will indicate whether the door is opening or closing, while automatic retractable steps at all doors will increase passenger safety and improve passenger flow.

The trains will be configured for future conversion to driverless operation.

"With the G1 train, we'll be launching a new era of underground operation," says VAG executive board member responsible for technology and marketing, Mr Tim Dahlmann-Resing. "We can carry more passengers, offer them greater comfort and also improve usability for people with reduced mobility. With this train running on Line U1, we can tackle the next 40 years of metro operation."

Categories: EuropeFleetMetrosNews

Tags: Germany Nuremberg Nuremberg Transport (VAG)Siemens

Construction Consultant appointed for Manila Metro; Phillipines

Nov. 27, 2018
Written by David Burroughs

THE Philippine's Department of Budget and Management (DBM) has awarded Japanese consortium OCGlobal a Pesos 11bn ($US 209.5m) general consultant contract for the Metro Manila Subway Project (MMSP) Phase 1, the first underground metro line in the country.

The consortium comprises Oriental Consultants Global, Tokyo Metro Company, Katahira & Engineers International, Pacific Consultants Company, Tonichi Engineering Consultants, and the Metro Development Company.

The contract is divided into three currencies: Yen 7.97bn ($US 70.1m), $US 79.73m, and Peso 3.58bn.

In March 2017, the Philippines and Japan International Cooperation Agency (Jica) signed a Yen 104.5bn loan agreement for the first phase of the project, which is expected to begin before the end of the year.

The Pesos 356.9bn first phase involves the construction of a 25km, 14-station underground line from Mindanao Avenue to Ninoy Aquino International Airport, as well as a depot, electro-mechanical systems and rolling stock, and the establishment of a Philippine Railway Institute.

The line will eventually be extended north to Bulacan and south to Cavite.

The Department of Finance has said it expects to begin operations between the three central stations of Mindanao Avenue-Quirino Highway, Tandang Sora, and North Avenue by May 2022, with Phase 1 fully operational by 2025.

Categories: MetrosNews Tags: ManilaMetro Manila Subway ProjectPhilippines

Report calls for short-Term changes to London Rail Network; UK

Nov. 26, 2018
Written by David Burroughs

THE London Assembly, an elected body which scrutinises the activities of the Mayor of London, has released a report into the city's rail network and called for short-term changes to improve services for passengers.

The London Assembly has called for improvements to be made until larger projects such as Crossrail 2 are complete.

While projects such as Crossrail 2 and the Mayor's Transport Strategy are expected to bring long-term improvements, the *Broken Rails: A rail service fit for passengers* report released on November 26 outlines six recommendations which it says are needed until then, including:

- a single rail strategy for London, produced in partnership by Transport for London (TfL) and Network Rail
- effective small-scale interventions
- an increase in funding for London's rail network
- additional funding from the Department for Transport (DfT) specifically for station access,

- better and more meaningful engagement with passengers, and
- a Healthy Stations Charter informed by the Mayor’s Healthy Streets Approach.

The report calls for more frequent and longer trains to operate on the existing network, following a series of strategic, targeted upgrades. It says the mayor and TfL should also produce a Healthy Stations Charter to deliver a drastic improvement in the accessibility of stations to cyclists and pedestrians, including passengers with reduced mobility.

The report also recommends launching dedicated passenger engagement channels for every station in London, regardless of its management, with a specific station user group for people using that station.

“We have seen from our investigation that the rail network is failing passengers because trains are too small, too infrequent and too unreliable; and stations are often difficult to access,” says London Assembly chair, Ms Caroline Pidgeon. “Poor rail infrastructure has a direct and negative effect on our quality of life and economic productivity – in a major world city like London, this is simply unacceptable.”

Categories: Commuter RailEuropeMetrosNews Tags: Crossrail2DfTLondonTfL

$A 1.38bn Sydney Metro Contract announced; Australia

Nov. 23, 2018
Written by Mark Carter

THE New South Wales state government has awarded Systems Connect, an unincorporated joint venture between CPB Contractors and UGL, an $A 1.38bn ($US 998.2m) contract for major infrastructure works associated with the extension of the second stage of the Sydney Metro project from Chatswood to Bankstown.

Mark Carter

The contract includes:

- 31 km of underground track to be laid in the twin railway tunnels from Chatswood to Sydenham
- 31km of overhead power equipment and 11 new substations
- installation of more than 350 km of high voltage, low voltage and tunnel service cabling
- the expansion of the Sydney Metro stabling facility at Rouse Hill to accommodate 37 new trains for Sydney Metro City & Southwest
- the construction of the Sydney Metro – South stabling facility at Marrickville, and
- installation of tunnel equipment such as ventilation, drainage and emergency evacuation and monitoring equipment.

"Due to the massive scale of the Sydney Metro City & Southwest project, the final contract value may vary due to ongoing fine-tuning and optimisation involving the 14 other major contracts," says transport and infrastructure minister, Mr Andrew Constance. "This is the seventh Sydney Metro City & Southwest contract to be awarded and the overall project budget range has been set at between $A 11.5bn and $A 12.5bn."

The second of five tunnel boring machines (TBM) has recently started tunnelling under Sydney to deliver a total of 31 km of tunnels between Marrickville and Chatswood for the Sydney Metro.

The two TBMs are currently constructing 8.1 km of twin tunnels from Marrickville to the new Sydney Metro station sites at Waterloo, Central, Pitt Street, Martin Place and on to Barangaroo.

Two more TBMs will excavate 6.2km from Chatswood to the edge of Sydney Harbour, while a fifth machine has been specially designed to deliver the twin tunnels under Sydney Harbour.

The initial 36km Metro North West line from Rouse Hill to Chatswood is expected to open in the second quarter of next year. The South West extension of the Metro, which will replace the existing heavy rail link to Bankstown, is due to open in 2024.

.Categories: Australia/NZMetrosNews Tags: AustraliaSydneytunnelling

TfL and Siemens sign £1.5bn New Tube for London Contract; UK

Nov. 20, 2018
Written by Keith Barrow

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

Delivery of the £1.5bn fleet, which is based on Siemens' Inspiro metro train platform, is due to begin in 2023, enabling the withdrawal of the six-car 1973 Stock trains currently used on the 71km line.

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

Siemens will be responsible for providing spare parts for the trains under a five-year fleet services contract, which is due to begin when the first trains enter service in 2024. Siemens will also provide digital fleet management services through its Railigent platform.

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

The procurement of new trains for the Piccadilly Line is part of LU's Deep Tube Upgrade Programme, which encompasses the Piccadilly, Bakerloo, Central, and Waterloo & City lines.

The programme will increase capacity on the Piccadilly Line from 24 to 27 trains per hour by 2026.

Categories: FleetMetrosNews Tags: LondonLondon UndergroundSiemensTfL

Bart proposes second Tunnel under San Francisco Bay; USA

Nov. 19, 2018
Written by Keith Barrow

PROPOSALS for a second rail tunnel beneath San Francisco Bay were discussed at a meeting of the Bay Area Rapid Transit (Bart) board of directors on November 15.

Photo: Wikipedia/Pi.1415926535 CC by SA 3.0

Construction of the Second Transbay Rail Crossing could begin within a decade and the project would relieve the existing tunnel between Oakland and San Francisco, which opened in the 1970s.

According to a recent study by the Bay Area Rapid Transportation Commission, the population of the Bay Area, Sacramento, Santa Cruz, Monterey and San Joaquin counties will increase by four million by 2040, with around 300,000 new jobs being created in San Francisco.

Currently around 45,000 passengers per hour cross the bay during the peaks and demand for Transbay transit is forecast to outstrip capacity by 2040, despite Bart's plans to upgrade the existing tunnel.

Bart says a second crossing would help to connect the Bay Area's strong economy with projected housing growth in Sacramento and the Central Valley while supporting economic development in the northern San Joaquin Valley and Sacramento.

Bart says the project would leverage Caltrain modernisation, California high-speed rail and other investments in the state's rail network, providing "seamless connections" between Bart and other rail systems. The second crossing would increase operational and maintenance flexibility and could facilitate the introduction of 24-hour operation.

In the short-term, Bart plans to award a contract for an economic impact assessment and a request for proposals will be issued this month for a contract to provide strategic advisory and programme management services. The contract is due to be awarded by mid-2019 and the winning bidder will carry out a feasibility study to narrow alternatives for the second crossing to a shortlist of between two and four options.

Categories: MetrosNewsNorth America   Tags: BartCaliforniaSan FranciscoUSA

Guangzhou begins Construction on six Metro Lines; China

Nov. 19, 2018
Written by David Burroughs

WORK on six new metro lines and extensions in Guangzhou, southeast China, was officially launched on November 19 with a ceremony at University South Station on Line 12.

The Yuan 100bn ($US 14.4bn) expansion will add 110km to Guangzhou's 400km network, with 73 stations, including 38 interchanges. The network currently carries more than 8.2 million passengers a day.

The 9.55 km southern extension to Line 3 will connect to Haishu Station, adding four stations to the line, while the 9.8km eastern extension of Line 5 will add six stations to the line.

The 21.9km second phase of Line 7 will run underground from University South station to Water Northwest, with 11 stations.

The 19.15 km new Line 10 will combine the 6.05 km Tianhe station – Shipai Bridge section of Line 3 with a newly-built section to Xilang Station, with 19 stations.

The 37.6km underground Line 12 will run from Fengfenggang station in Baiyun District to University South station with 25 stations.

Line 4 phase two will connect Jiahe Wanggang station with Guangzhou railway station. The 11.9 km underground line will have eight stations.

.Categories: AsiaMetrosNews Tags: ChinaGuangzhou

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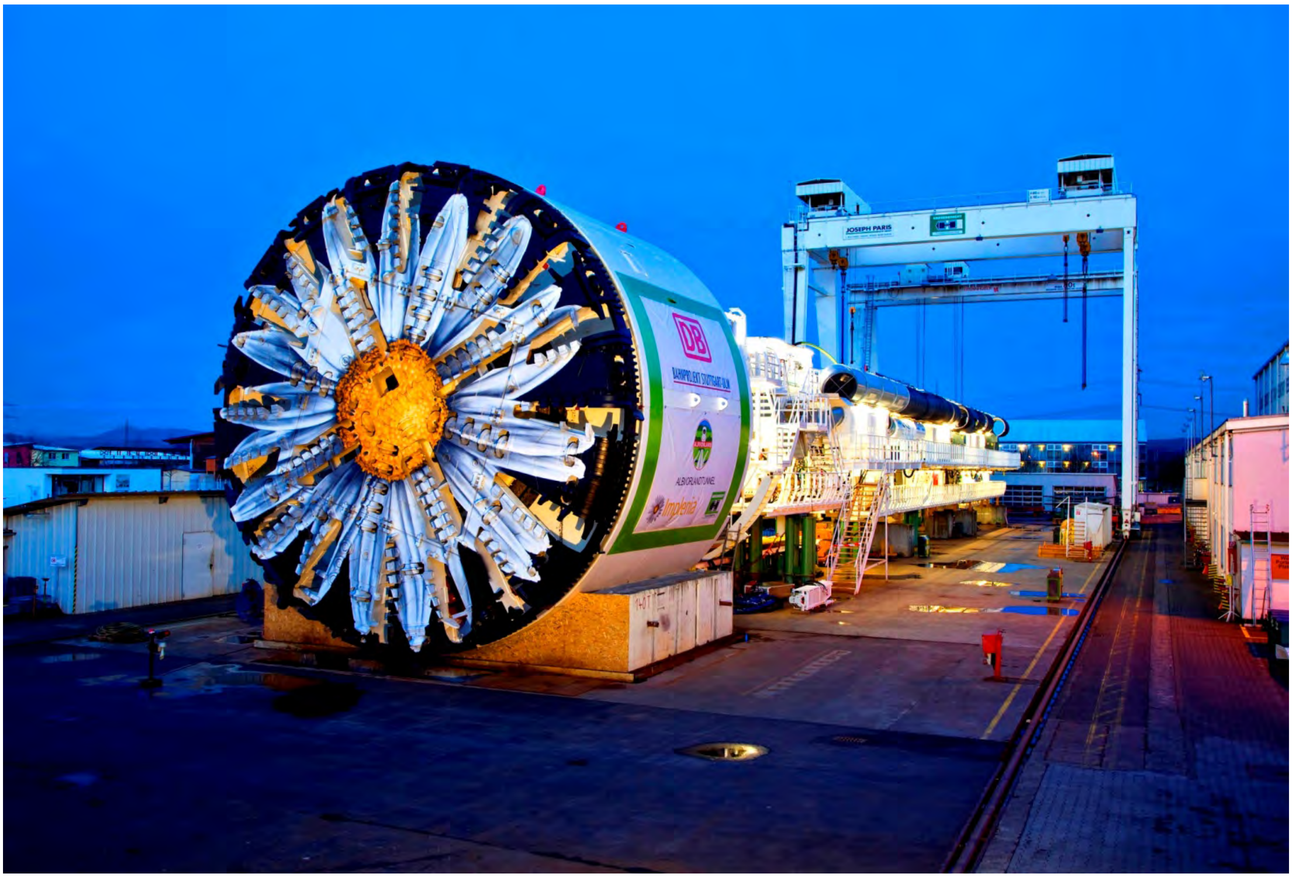

Tunnel Bore Machine build by Kirchheimer; Switzerland

Colombo Light Metro Project moves forward; Sri Lanka

Jul. 5, 2018
Written by Keith Barrow

SRI LANKA's Ministry of Megapolis and Western Development announced on July 1 that land acquisition has begun for the first light metro line in Colombo following the completion of a feasibility study commissioned by Japan International Cooperation Agency (Jica).

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Arriva continues Pågatågen operations under new contract
Dec 12, 2018 | Main line

The 15.3 km Green Line will run from Colombo Fort main line station in the west to Borella, Battaramulla and Malabe IT Park in the east. The line will serve 16 stations with journey time of 27 minutes between the termini.

The Sri Lankan government expects to conclude a $US 1.7bn loan with Jica by the end of the year, which will fully-finance the project. The 0.1%-interest loan will have a 40-year repayment term and a 12-year grace period.

Construction is due to begin in 2020 with commercial operations expected to start by 2024.

Categories: AsiaMetrosNews Tags: JICASri Lanka

Europe's largest TBM to dig Paris RER Line E extension; France

Nov. 28, 2018
Written by Keith Barrow

THE mayor of Paris, Mrs Valérie Pécresse, and French transport minister, Mrs Elisabeth Borne attended a ceremony in Courbevoie, Paris, on November 28 to officially name Europe's largest tunnel boring machine (TBM), which will be used to excavate a tunnel for the €3.8bn western extension of RER Line E.

Tunnel Bore Machine

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TBM *Virginie* is 90m long, weighs 1800 tonnes and has an 11m-diameter cutting disc. The machine will operate six days a week, digging and lining up to 15m of tunnel a day at depths of up to 40m.

The 8km tunnel from St Lazare to Nanterre-la-Folie is a key component of the Eole project, which also involves upgrading the existing 47km line to Poissy and Mantes-la-Jolie. The extension will cut journey times between western suburbs and La Défense, an important commercial centre on the west side of Paris, by up to 17 minutes.

It will also provide existing Line E passengers with direct access to La Défense, and will relieve congestion by between 10 and 15% on the Auber – La Défense section of RER Line A, which Line E will parallel, and part of RER Line C.

Line E services will be extended to Nanterre in 2022 and Mantes-la-Jolie in 2024. Ridership is forecast to increase to 650,000 passengers per day when all phases of the project are complete.

Capacity across the core section of Line E will be increased from 16 to 22 trains per direction per hour with the introduction of CBTC, while a new fleet of RER NG trains will be delivered from 2021 onwards.

For detailed data on commuter rail projects around the globe, subscribe to IRJ Pro.

Categories: Commuter RailNewsUncategorized
Tags: ParisRER

Ruhrbahn orders 26 LRVs from Bombardier; Germany

Dec. 12, 2018
Written by Keith Barrow

GERMANY light rail operator Ruhrbahn signed a contract worth nearly €80m with Bombardier on December 12 for 26 Flexity Classic low-floor LRVs for use on the tramway networks in Essen and Mühlheim.

Bombardier Flexity Classic low Floor Light Rail Vehicle LRV

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Norske Tog exercises option for 25 Flirt EMUs
Dec 12, 2018 | Fleet

The NF4 vehicles will be 30m long and 2.3m wide, accommodating at least 171 passengers.

Deliveries will begin in 2021 and the order will enable the withdrawal of the final remaining high-floor trams in Essen.

Ruhrbahn launched tenders for the contract in May.

Categories: Fleet Light RailNews

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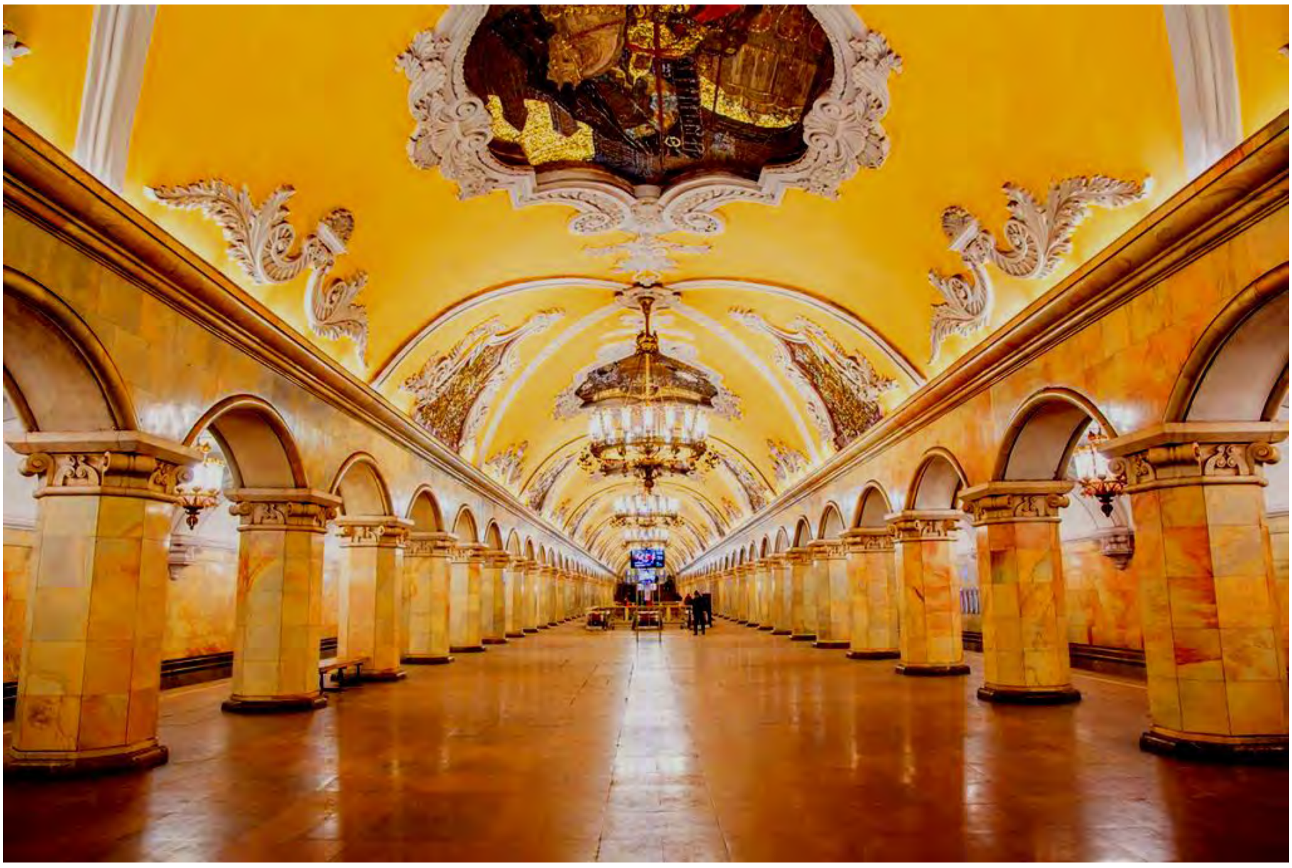

History of Underground Metro; Station in Moscow, Russia

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Surch more about: METRO/TRANSIT/MRT/SUBWAY/ UNDERGROUND in Encyclopaedia Britannica

Subway

WRITTEN BY:

- The Editors of Encyclopaedia Britannica

See Article History
Alternative Titles: métro, tube, underground, underground railway

Subway, also called **underground, tube**, or **métro**, underground railway system used to transport large numbers of passengers within urban and suburban areas. Subways are usually built under city streets for ease of construction, but they may take shortcuts and sometimes must pass under rivers. Outlying sections of the system usually emerge aboveground, becoming conventional railways or elevated transit lines. Subway trains are usually made up of a number of cars operated on the multiple-unit system.

Munich: Underground Rail System. Watch a Subway Tunnel being dug for the Munich Underground Rail System, 2009; film.*Contunico © ZDF Enterprises GmbH, Mainz*

The first subway system was proposed for London by Charles Pearson, a city solicitor, as part of a city-improvement plan shortly after the opening of the Thames Tunnel in 1843. After 10 years of discussion, Parliament authorized the construction of 3.75 miles (6 km) of underground railway between Farringdon Street and Bishop's Road, Paddington. Work on the Metropolitan Railway began in 1860 by cut-and-cover methods—that is, by making trenches along the streets, giving them brick sides, providing girders or a brick arch for the roof, and then restoring the roadway on top. On Jan. 10, 1863, the line was opened using steam locomotives that burned coke and, later, coal; despite sulfurous fumes, the line was a success from its opening, carrying 9,500,000 passengers in the first year of its existence. In 1866 the City of London and Southwark Subway Company (later the City and South London Railway) began work on their "tube" line, using a tunneling shield developed by J.H. Greathead. The tunnels were driven at a depth sufficient to avoid interference with building foundations or public-utility works, and there was no disruption of street traffic. The original plan called for cable operation, but electric traction was substituted before the line was opened. Operation began on this first electric underground railway in 1890 with a uniform fare of twopence for any journey on the 3-mile (5-kilometre) line. In 1900 Charles Tyson Yerkes, an American railway magnate, arrived in London, and he was subsequently responsible for the construction of more tube railways and for the electrification of the cut-and-cover lines. During World Wars I and II the tube stations performed the unplanned function of air-raid shelters.

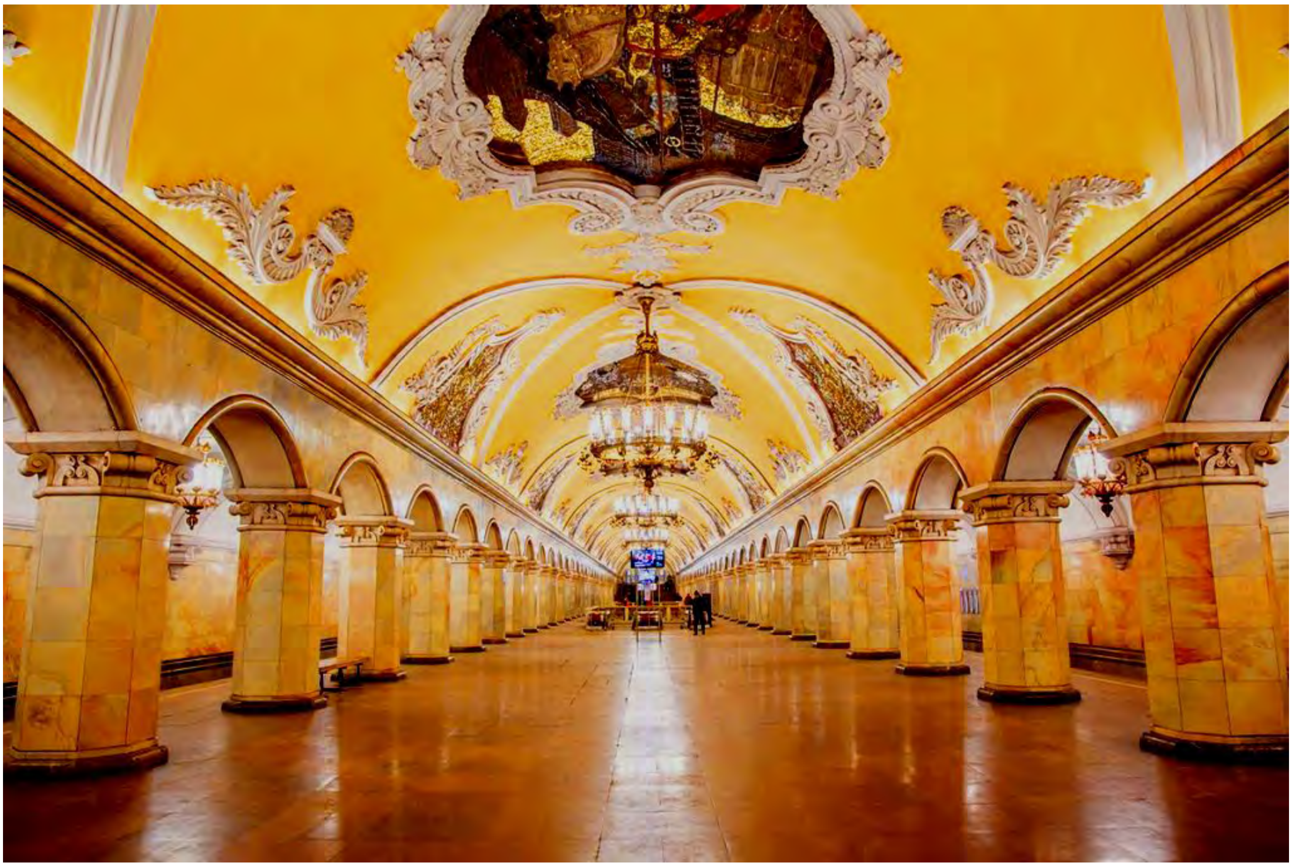
Many other cities followed London's lead. In Budapest, a 2.5-mile (4-kilometre) electric subway was opened in 1896, using single cars with trolley poles; it was the first subway on the European continent. Considerable savings were achieved in its construction over earlier cut-and-cover methods by using a flat roof with steel beams instead of a brick arch, and therefore, a shallower trench.

In Paris, the Métro (Chemin de Fer Métropolitain de Paris) was started in 1898, and the first 6.25 miles (10 km) were opened in 1900. The rapid progress was attributed to the wide streets overhead and the modification of the cut-and-cover method devised by the French engineer Fulgence Bienvenue. Vertical shafts were sunk at intervals along the route; and, from there, side trenches were dug and masonry foundations to support wooden shuttering were placed immediately under the road surfaces. Construction of the roof arch then proceeded with relatively little disturbance to street traffic. This method, while it is still used in Paris, has not been widely copied in subway construction elsewhere.

In the United States the first practical subway line was constructed in Boston between 1895 and 1897. It was 1.5 miles (2.4 km) long and at first used trolley streetcars, or tramcars. Later, Boston acquired conventional subway trains. New York City opened the first section of what was to become the largest system in the world on Oct. 27, 1904. In Philadelphia, a subway system was opened in 1907, and Chicago's system opened in 1943. Moscow constructed its original system in the 1930s.

New York City Subway, 1905; Silent Film Footage depicting Tunnels and Platforms of the New York City Subway System as they appeared in 1905, a year after Sections of the Subway were opened.*S tock footage courtesy The WPA Film Library*

Tunnel Work on the New York City Subway, 1901.*Library of Congress, Washington, D.C.*



The Mayakovskaya Station (1938–39) in the Moscow Subway

In Canada, Toronto opened a subway in 1954; a second system was constructed in Montreal during the 1960s using Paris-type rubber-tired cars. In Mexico City the first stage of a combined underground and surface metro system (designed after the Paris Métro) was opened in 1969. In South America, the Buenos Aires subway opened in 1913. In Japan, the Tokyo subway opened in 1927, the Kyōto in 1931, the Ōsaka in 1933, and the Nagoya in 1957.

Automatic trains, designed, built, and operated using aerospace and computer technology, have been developed in a few metropolitan areas, including a section of the London subway system, the Victoria Line (completed 1971). The first rapid-transit system to be designed for completely automatic operation is BART (Bay Area Rapid Transit) in the San Francisco Bay area, completed in 1976. Trains are operated by remote control, requiring only one crewman per train to stand by in case of computer failure. The Washington, D.C., Metro, with an automatic railway control system and 600-foot- (183-metre-) long underground coffered-vault stations, opened its first subway line in 1976. Air-conditioned trains with lightweight aluminum cars, smoother and faster rides due to refinements in track construction and car-support systems, and attention to the architectural appearance of and passenger safety in underground stations are other features of modern subway construction.

London “TUBE”; UK

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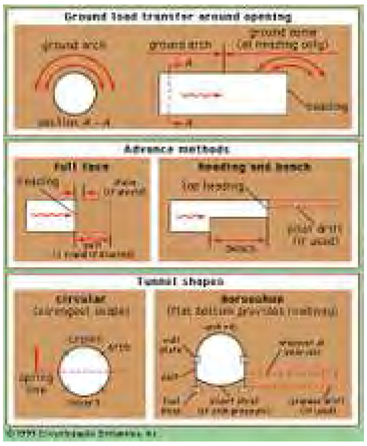

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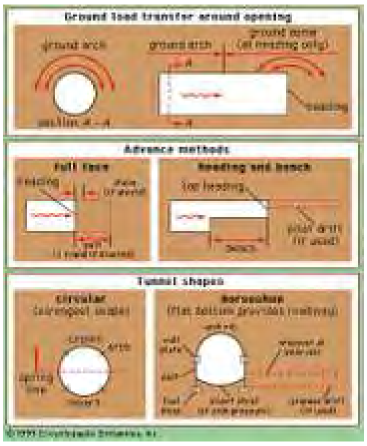

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METRO 06, December 2018

Mass Rapid Transit Double Decker Rolling Stock build by Bombardier; USA

ACTIVITIES FOR URBAN MOBILITY SOLUTIONS INTERNATIONAL

December 12, 2018
Commuter/Regional, Mechanical, News, Passenger

For NJ Transit, another rolling Stock Innovation; Double Decker Mass Transit; USA

Written by William C. Vantuono, Editor-in-Chief

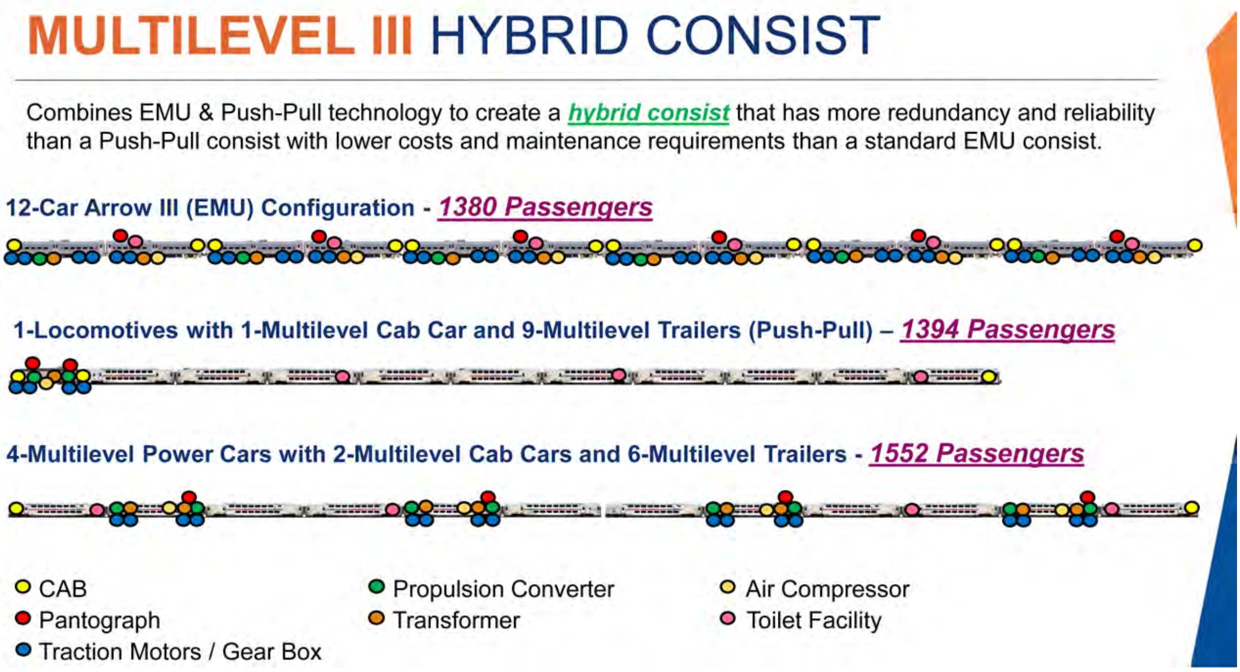
Bombardier will build NJT's new Multilevel III fleet, which includes powered cars

By 2026, provided the procurement is fully funded and all options are exercised, New Jersey Transit—empowered by an infusion of much-needed funding by Governor Phil Murphy following a starvation diet imposed by his predecessor, Chris Christie—will have replaced its entire fleet of aging single-level cars with nearly 650 new Multilevels, many of which will be powered electric vehicles, the first of their type in North America.

On Dec. 12, NJT, as part of its Fiscal Year 2018 budget, awarded Bombardier Transportation a $669.1 million contract for 113 Multilevel III regional/commuter railcars: 58 powered cars with electric propulsion (AC catenary), and 55 non-powered cars—33 cab cars and 22 trailer cars, 6 of those with ADA-compliant restrooms. With all options exercised—886 additional cars, including 636 for NJT and 250 for SEPTA, in a joint procurement—the total value of the contract for Bombardier is $3.6 billion.

Bombardier, which has supplied 421 Multilevel railcars plus a fleet of ALP-45DP dual-power (AC electric/diesel) and ALP-46 electric locomotives in recent years, won the Multilevel III contract over China's CRRC, the only other bidder.

LTK Engineering Services, NJT's primary vehicle design, engineering and manufacturing consultant that has worked on numerous contracts, was awarded a $42 million contract ($36.7 million plus 5% for contingencies) for the Multilevel III build. The new vehicles are scheduled to begin testing in the third quarter of 2022 and are expected to enter revenue service during the second quarter of 2023.



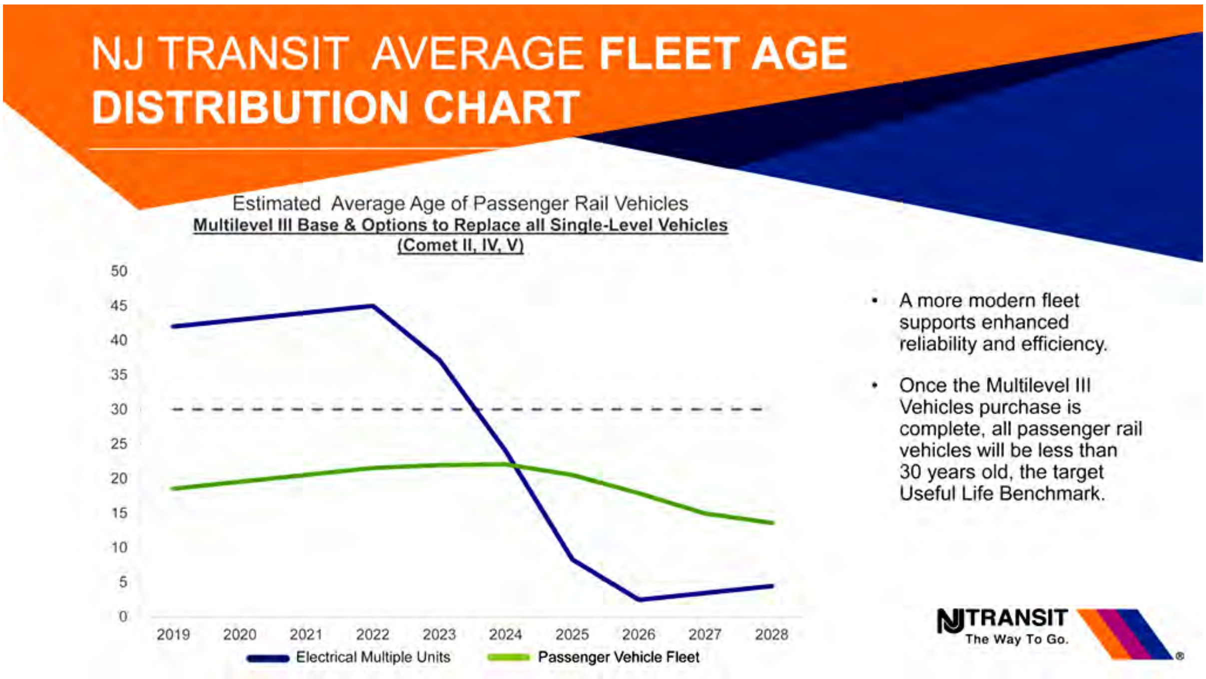
The order for 113 Multilevel IIIs, NJT's largest railcar order in recent years, will allow the agency to begin replacing the oldest equipment in its fleet, starting with the remaining 160 Arrow III EMU (electric multiple-unit) cars—which date to the 1970s and were rebuilt by ABB Traction in 1993—continuing with the Comet II, III, IV and V single-level cars.

"This historic purchase is a perfect example of how NJ Transit is reclaiming its position as a national leader in transportation,'' said Executive Director Kevin Corbett. "The new [powered] Multilevel III cars break new ground in railroad technology, and we're proud that NJ Transit is leading the way. With this investment, we'll be able to retire the oldest railcars in our fleet, while increasing reliability, efficiency and customer comfort.''

✕ No	Compliant with current Americans with Disabilities Act (ADA) regulations	✓ Yes
✕ No	Navigate phase gaps with different voltages automatically	✓ Yes
✕ Higher	Cost of operation, maintenance and spare parts	✓ Lower
✕ No	Compatible with existing Multilevel Vehicles & Locomotives	✓ Yes
✕ No	Regenerates power to the catenary	✓ Yes
80 MPH	Maximum Speed	110 MPH
✕ No	2 x 2 seating	✓ Yes
1380 Seats	12 Car consist capacity	1552 Seats
40,046 Miles	Mean Distance Between Failure (based on October 2018 data)	370,575 Miles

The groundbreaking aspect of this order is the 58 powered cars that, when combined with non-powered trailers and cab cars, will create "Hybrid EMU" bi-directional trainsets, with a cab car at each end. Each powered car, equipped with a single pantograph and two propulsion packages (transformer plus powered two-axle trucks with traction motors, one set at each end of the car), can haul up to two trailers/cabs. Thus, a 12-car Hybrid EMU trainset would consist of 4 powered cars, 6 trailers and two cabs. The maximum-size trainset NJT envisions, based on available platform length, not propulsion power, is 14 cars.

Since each powered car is equipped with two propulsion packages, there is no single point of failure, unlike locomotive-hauled consists. These units will feature regenerative braking that puts electricity back into the catenary power grid, and RDS (remote diagnostics). They will also feature FRA-mandated 180-day inspection cycles, as opposed to the 92-day Arrow III cycles. And once the NJT is fully built out, it will be far more operationally flexible than what exists today.



Like NJT's 52 ALP-45DP locomotives (35 in service; 17 on order), the Multilevel IIIs will be the first of their type in North America. They increase seating capacity from 1,380 seats on a 12-car Arrow III trainset to 1,552 seats on a new 12-car Multilevel III trainset. They will feature the roomier and popular two-by-two seating, introduced on the Multilevel I and II fleets, as opposed to the uncomfortable and cramped three-two bench seats on tall the single-level cars. Other customer amenities include USB charging ports and new, onboard information displays.

"This purchase is allowing NJ TRANSIT to take a step toward the goal of having the overall average age of all rail vehicles under 30 years old, making for a more modern fleet that supports enhanced comfort, reliability and efficiency," NJT said. "The benefits of the Multilevel IIIs include reduced operating costs, higher acceleration [rates] and an 11% increase in seating capacity. The Multilevels also have a higher Mean Distance Between Failure (MDBF): 370,575 miles, compared to 40,046 miles for the Arrow IIIs, based on October 2018 data."

As well, the Arrow III fleet is certified for an MOS (maximum operating speed) of 80 mph. The Multilevels, whether in self-powered Hybrid EMU or locomotive-powered push-pull trainsets, have an MOS of 110 mph.

Editor's Note: Is NJ Transit back from the oblivion masterminded by the meddling, egocentric Chris Christie? Maybe not completely, but it's getting close. Way to Go, Kevin Corbett and NJT employees! I would also like to acknowledge the assistance of NJT Senior Director Equipment Design and Engineering Dave Carter, and Nancy Snyder from the Corporate Communications staff, in preparing this article.

Categories: Commuter/Regional, Mechanical, News, Passenger Tags: Bombardier Transportation, Breaking News, Hybrid EMU, New Jersey Transit, NJ Transit, NJT

FRA green-Lights PATH Positive Train Control, PTC; Hudson, USA

December 06, 2018
C&S, Commuter/Regional, News, Passenger, PTC, Rapid Transit, Regulatory, Safety
Written by Paul Conley, Engineering Editor; and Editor-in-Chief, Railway Track & Structures

Trevor Logan Photo

The Federal Railroad Administration has certified a system-wide signals upgrade by the Port Authority Trans Hudson (PATH) transit system as meeting all the requirements for Positive Train Control (PTC). The move comes several weeks before the Dec. 31 federal deadline.

“A system for which safety has always been the top priority is now even safer,” Port Authority of New York & New Jersey Executive Director Rick Cotton said in a statement. “This is an important moment in PATH’s commitment to provide the highest level of safety to the riding public, and we thank all riders for their patience as PATH has installed this critical technology.”

PTC is a component of the more extensive system known as **Communications-Based Train Control (CBTC),** which calculates and communicates a train’s exact position, speed, travel direction and safe braking distance. PATH has already begun installing **CBTC** to replace its fixed-block system. The transit system, which links Newark to New York City through tunnels under the Hudson River, expects CBTC to allow for more frequent trains and less congestion on station platforms.

The FRA’s blessing follows a 17-week testing period during which PATH closed a series of tunnels and stations on weekends.

Siemens Mobility is the lead contractor in the consortium that is designing and installing the CBTC system. One company with a piece of the deal is D/A Builders, LLC, a joint venture of Daidone Electric of Newark, N.J. and Aldridge Electric of Libertyville, Ill.

Categories: C&S, Commuter/Regional, News, Passenger, PTC, Rapid Transit, Regulatory, Safety
Tags: Breaking News, PATH, Port Authority of New York and New Jersey

Alstom extends Parts Contract for San Francisco's Light-Rail, Cable Cars; USA

Written by Paul Conley, Editor-in-Chief

Cable Car 25 passing through Union Square | December 27, 2012
San Francisco Municipal Transportation Agency (SFMTA)

Alstom won a three-year, $56 million (50 million euros)) extension to its Vendor Managed Inventory (VMI) services contract with the San Francisco Municipal Transportation Agency (SFMTA).

Under the terms of the deal, Alstom manages the inventory supply chain and provides parts for the SFMTA's fleet, which is composed of 149 light rail vehicles, 39 historic streetcars and 31 cable cars. Alstom and San Francisco's transit agency signed the original contract in 2013.

Alstom, headquartered in Saint-Ouen, France, provides inventory planning and automated part replenishment via an integrated IT system, obsolescence management, and management and oversight of the VMI program. The company will also provide as-needed technical and engineering services.

"We take immense pride in supporting San Francisco and their focus on transporting passengers safely, efficiently and reliably, and we thank San Francisco Municipal Transportation Agency for the continued trust they have placed in us and this partnership," said in a written statement announcing the contract extension.

Alstom runs the VMI system from a 100,000 sq. ft. Mare Island facility in Vallejo, Calif. The company employs 50 people at the site, which houses production and warehousing operations.

Alstom and Siemens Mobility agreed to merge earlier this year. That transaction is expected to close early in 2019.

Categories: Passenger, Rapid Transit/Light Rail, Supplier News
Tags: Alstom, cable cars, San Francisco Municipal Transportation Agency, trolleys

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"*TRAMTRAIN*", Line 18, Cologne/Bonn; Germany

ACTIVITIES FOR URBAN MOBILITY SOLUTIONS INTERNATIONAL

Max Bögl plans to enter urban Maglev Market; Germany

11 Jul. 2018

GERMANY: Construction company Max Bögl is planning to relaunch the maglev concept with a view to winning export contracts. Instead of a high speed application, the company envisages low or medium speed operation over distances up to about 30 km.

Following the demise of Transrapid maglev technology in Germany after Transrapid 08 collided at around 170 km/h with a maintenance vehicle in September 2006, Max Bögl later revisited the concept and decided to explore its potential. The company built a short test guideway in Sengenthal, not far from Nürnberg, with a view to refining the infrastructure, vehicle and control technology.

Speaking to business publication *Handelsblatt*, CEO Stefan Bögl said that ‘worldwide there is great potential for the technology’ and that the ‘market could be worth billions’. The initial target is China, where the company has reportedly found a partner business with a view to building a 3·5 km test installation in Chengdu.

Existing low to medium speed maglev applications include the Linimo light metro originally built to serve the World Expo east of Nagoya in 2005, the Mentougou Line in Beijing, where passenger-carrying tests began in August 2017, and a peoplemover at Incheon Airport in South Korea.

Driverless Metro, Maglev and Tram Line open in Beijing; China

04 Jan. 2018

The Yanfang Line is the first driverless Metro Line in Beijing

CHINA: December 30 saw a significant expansion of the urban rail network in Beijing, with the opening of a driverless metro line, a maglev line and a tram line. An existing metro line was also extended.

The 14·4 km Yanfang Line becomes the first driverless metro line in the city. Running in the southwest between Yanshan and Yancun East, the nine-station route is operated by Beijing MTR Operation Administration Co.

CRRC Changchun has supplied a fleet of four-car Type B Dolphin trainsets. The stainless-steel-bodied sets have a maximum speed of 80 km/h and operate with on-board attendants. Beijing Traffic Control Technology Co has supplied **Communications-Based Train Control (CBTC).**

Construction of the Yanfang Line started in February 2016. A 6·1 km branch from Raoyuefu to Zhoukoudiazhen with two intermediate stations is under construction and due to open in 2021.

The eastern terminus of the Yanfang Line offers interchange with the Fangshan Line, which was itself extended by 2·3 km from to meet the new line on December 30. A 4·6 km northern extension from Guogongzhuang to Fengyiqiao South is currently under construction.

The city's first medium-speed maglev line began revenue service on the same day. Line S1, also known as the Mentougou Line, serves seven stations on an 8·3 km route between Shichang and Jin'anqiao in western Beijing. A 1·6 km extension to Pingguoyuan on metro Line 1 is due to open in 2019.

Construction got underway in October 2013 and passenger-carrying tests started in August 2017. The route includes a short underground section where it crosses the Beijing – Shacheng railway.

CRRC Tangshan has supplied 10 six-car trainsets with a maximum speed of 110 km/h. These are stabled in a depot at the western end of the line.

Modern trams have also been added to the city's transport mix with the commissioning of the Xijiao LRT. The 8·6 km line serves six stops between Bagou on metro Line 10 and Xiangshan Park in the northwest of the city. There are four tunnels under the main road junctions totalling 1 km.

Services are operated by Beijing Public Transit Tramway Co, with minimum headways of 3 min. CRRC Dalian has supplied a fleet of 31 five-section 100% low-floor bidirectional trams based on the Sirio design under a 10-year technology licensing agreement signed by AnsaldoBreda (now Hitachi Rail Italy) and CNR Dalian (now CRRC Dalian) in 2012.

As 4·4 km of the route is catenary-free, the trams use the Tramwave ground-level power supply on this section. In 2012 Ansaldo STS licensed Tramwave, along with traction equipment and train control monitoring to CNR Dalian and General Resources Company.

The trams are stabled at a depot at Bagou. Able to run in pairs, they have a capacity of 300 passengers and a maximum speed of 70 km/h.

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- 11 Jul 2018 - Max Bögl plans to enter urban maglev market
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- 28 Dec 2017 - Second metro line opens in Hefei
- 26 Dec 2017 - Wuhan opens three metro lines in one day
- 03 Jan 2017 - Beijing metro adds Line 16
- 30 Dec 2015 - Beijing and Guangzhou metros expand
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“*TRAMTRAIN*”: KVB Cologne-Bonn, Line 18 a multimodal combined Underground, Street Tramway, elevated Transit and Commuter-Railway; Germany

Line 18 of KVB Cologne-Bonn *“TRAMTRAIN”* running as Urban, Suburban and Inter-Urban Railway

The line 18 runs in the centre of Cologne as an underground/U-Bahn, in the outskirts as a Street-Tram and between Cologne and Bonn and Cologne Thielenbruch as a Intercity Commuter-Railway.

Line 18 *"TRAMTRAIN"* KVB Cologne-Bonn running as City-Underground

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METRO 08, December 2018

Proposed View of the Chatrapati Sambhaji Udyan and Deccan Metro Rail Station in the traditional Pargadi Style – Pune Metro Rail Project; India

ACTIVITIES FOR URBAN MOBILITY SOLUTIONS IN INDIA

An exclusive Interview with Dr. Brijesh Dixit, Managing Director, MahaMetro (Maharashtra Metro Rail Corporation Ltd); India

11 September, 2018 by Team - Rail Analysis India
Team - Rail Analysis India
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Dr. Brijesh Dixit

Managing Director, Maharashtra Metro Rail Corporation Ltd

ABOUT DR. BRIJESH DIXIT

An acclaimed Railway Administrator and an efficient infrastructure builder. An eminent institution builder and urban transport professional. Presently heading Nagpur/Maharashtra Metro Rail Corporation Ltd. as Managing Director.Currently as MD, Nagpur/Maharashtra Metro Rail Corporation, built the organisation from scratch, being employee no. 1 on 18th Feb' 2015, the day of its incorporation. Has ensured, a very expeditious start and fast progress of this major project overcoming numerous administrative and organizational challenges. Organised quick and smooth land acquisition; achieved fast tie up with international funding agencies viz. KfW Germany and AFD France. Ensured expeditious appointments of consultants and contractors. Achieved building up and functioning of organizational structure at board level and at the level of the corporation.

INTERVIEW With Dr. Brijesh Dixit

Rail Analysis India: Please highlight the special features of Pune Metro & Nagpur Metro for our global audience? What makes them truly special?

Dr. Brijesh Dixit: The unique and innovative features that are being implemented in the Nagpur Metro are:

- Integrating Solar Energy from inception to meet 65% of energy requirements by installing solar panels along the station rooftops, depot shed rooftops and vacant spaces
- Superior Project Management through Digital Project Management Platform 5D BIM to ensure project completion without any cost and time overrun and ensuring world class quality, safety and environmental protection of the project
- Multi Modal Integration, Efficient & High-Quality Feeder Service to provide First and Last Mile Connectivity right from inception and promoting public and Non-Motorized Transport

Launching of Double Decker Metro Segments – Reach 1 – Nagpur Metro Rail Project. The Right of Way will be shared by the existing road on the ground level, Elevated National Highway on the first level and the Metro on the second level

- EMV based common mobility card for seamless travel has been planned on PPP Basis. Same will be implemented at Pune, once the operation stage is reached
- Optimization and rationalization of the design of civil and system infrastructure targeting cost savings of About 10% of the DPR Cost Estimate
- Adoption of Transit Oriented Development since inception with half of revenue accruing to Maha-Metro
- Setting of state of the art ultra-modern quality Labs with Bureau Veritas at works site to test the quality of materials used in the construction works and ensure overall quality of construction
- MoU with DRDO for anaerobic Bio Digester to ensure 100% smart sewage treatment and ensure 100 % water recycling

- Designing state of the art station by adopting unique architecture features by international architects
- Non-Fare Box revenue is likely to be 50% of fare box revenues of the metro
- NOVEL CITIZEN CONNECT in the form of Metro-Samvad has been adopted for direct communication with all stake holders including citizens to involve their active participation in the project.

These same features will be carried forward to Pune as well.

” A particularly noteworthy thing is about station development of Pune. A very distinct station architecture is being developed there fully reflecting the rich history, heritage, art, and culture of the great city if Pune. The stations near industrial area will reflect industrial themes. Those near historical monuments will include their theme. Stations by the riverfront will have a reflection of that in such a way that they become the modern identity of the city and are ready to complete the rejuvenation of the surrounding areas. Rich musical heritage of the city will also be suitably included in the station design. “

Proposed View of the Chhatrapati Sambhaji Udyan and Deccan Metro Rail Stations in the traditional Puneri Pagadi style – Pune Metro Rail Project

Rail Analysis India: What is current status of Pune and Nagpur metro projects? Can you please tell more about the achievements of Pune and Nagpur metro projects in last 3 months?

Dr. Brijesh Dixit: Nagpur Metro Rail Project consists of 38.215 Km elevated Metro Corridor which includes 40 stations and 2 train maintenance Depots, the Alignment is divided into two corridors i.e. North-South (19.658 Km) & East-West (18.557 Km). The estimated completion Cost is Rs. 8680 crores. The total physical progress achieved till 31st July 2018 is 67.36% and the financial progress is 44.89%.

The route length of Pune Metro Rail Project is 31.25 km (26.23 km elevated & 5.02 km underground) divided into two corridors i.e. from Pimpri Chinchwad Municipal Corporation (PCMC) to Swargate (16.59 Km) and from Vanaz to Ramwadi (14.66 km) with 30 stations and two Car Maintenance Depots. The approved completion cost is Rs. 11,420 crores. The approved completion cost is Rs. 11,420 crores. The total physical progress achieved till 31st July 2018 is 22% and the financial progress is 15%.

Critical Spans of the Metro Viaduct navigating across a very congested area with Mayo Hospital on one side, Ram Mandir on the other and over the existing Railway Overbridge (Ramjhula Flyover) – Reach 4 – Nagpur Metro Rail Project

Rail Analysis India: When will the trials for first phase of both these project start? What are the expected completion timelines for both these projects?

Dr. Brijesh Dixit: Trial run of the very first section of 5.4 km of Nagpur Metro Rail Project was flagged off on 30th September 2017. The Commissioner of Metro Rail Safety (CMRS) authorization was received on 16th April 2018 and currently joy rides are carried out.

” The phase 1 of Nagpur Metro is expected to be completed by December 2019 with opening of 24 km by March 2019 and the remaining 14 km by the end of 2019. The Pune Metro project is expected to be completed by the end of 2021. “

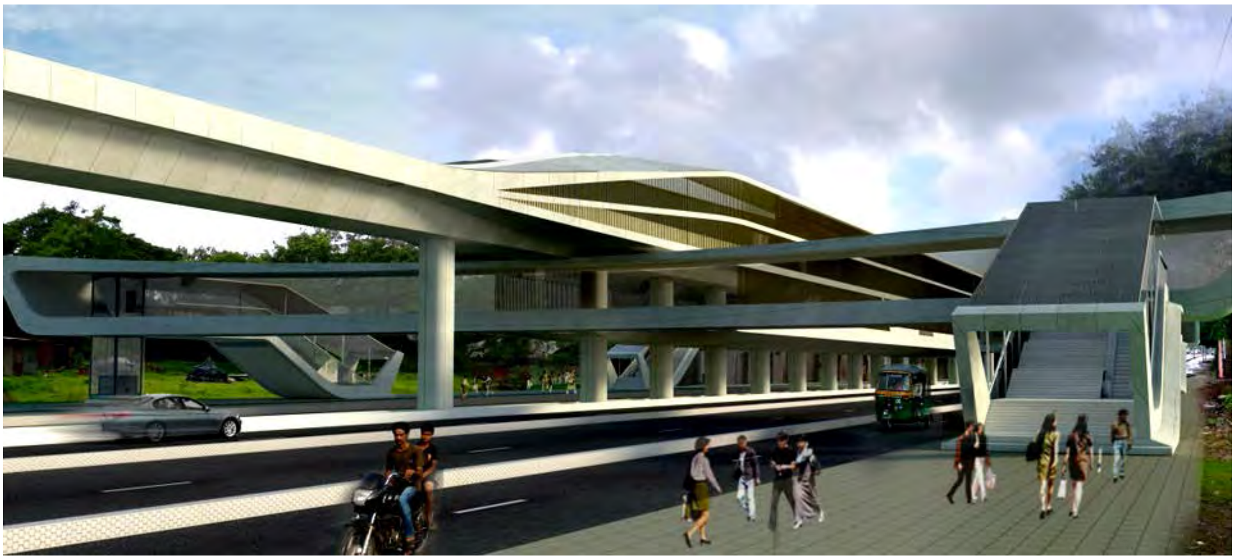
Rail Analysis India: What will be the latest & modern facilities, commuters will have at stations and in the metro trains of the both these mega projects?

Dr. Brijesh Dixit: Metro stations and train would incorporate some of the most advanced and state of the art facilities aimed at providing overall comfort to all those using this service.

Some of the facilities provided at metro stations have been named here:

- State of the art metro stations incorporating aesthetic designs
- Themes and architectural designs that match the local flavor
- Escalators and lifts to cross the platform and move over to other side
- Displays and public-address system giving information about train movement
- CCTV camera network installed to track every movement in the station premises
- Child care facility room, especially for babies who need to be fed by mother
- Door Frame Metal Detector (DFMD) and Hand-Held Metal Detector (HHMD) for checking
- Baggage scanner to check every consignment that a passenger is carrying
- Automatic Fare Collection (AFC) gates for easier access to passengers
- Emphasis on maximum of natural light and sustainable material during construction
- Solar panels for use of maximizing use of non-conventional energy
- Rainwater harvesting and use of anaerobic bio-digesters for smart sewage treatment and water recycling

- Basic amenities like supply of potable water and wash rooms for commuters
- Dedicated parking slots and multi-modal integration facilities in the vicinity
- Dedicated parking lots for non-motorized vehicle parking at select stations



While incorporating these special features at stations, Maha Metro has also included exclusive features for the specially able citizens. Some of such friendly features can thus be listed:

- Low height ticket counter
- Special bathrooms for specially able with tactile path
- Switches with instructions in Braille language
- Reserve parking and ramps for specially able
- Wider AFC gates to accommodate wheel chair to pass through

Aerial View of Double Decker Structure – Reach 1 – Nagpur Metro Rail Project. The Right of Way will be shared by the existing road on the ground level, Elevated National Highway on the first level and the Metro on the second level

The Metro Trains have also been designed by providing special features. The salient features are:

- LED Lighting and Displays inside the metro coaches
- Push buttons to enable passengers to talk to staff on board for help
- Fully air-conditioned coaches to provide full comfort during journey
- Reserved seating for women, elderly and those with special needs
- Modern coaches with aesthetically pleasing design and CCTV camera watch
- Automatic door opening/closing facility and VVVF drive for regenerative braking system

Rail Analysis India: How will these projects change the whole scenario of the transport sector of both cities? (Sir please add about the multi modal integration, first and last connectivity, feeder services, bike sharing, e vehicles)

Dr. Brijesh Dixit: Nagpur, like any other major city, has, over the years, seen industrialisation and a steady rise in its population. The city has witnessed certain industrial growth and a steady progress over the years. However, the city could not cope up with these twin phenomena of rising population and industrialisation. It's high time for Nagpur to develop a better infrastructure and transport facilities. The proportion of citizens using public transport mode is as low as 10 %. The frequency of buses plying on city roads is low than desired. This leads to heavy dependence on private transport and people use their personal transport to commute in the city. The vehicles on city roads are predominantly two wheelers which are used by school & college going students and youths of Nagpur. Nagpur Metro Rail Project will ensure a definite shift and commuters would shift from private transport to metro. This would reduce number of accidents on the roads and safeguard environment for future generations. Pune is no different from Nagpur, when it comes to traffic-related issues. The ever-increasing vehicular population on city roads, demands that a mass rapid transport system be in place in the cultural capital of Maharashtra. Stations are being planned near bus stops, railway stations and major transit routes. An efficient form of sustainable urban transport will be provided in the form of metro. This will not only reduce the traffic woes of Pune, but also help in integrating various other modes of public transport.

While Maha Metro is going ahead with project work at Nagpur and Pune in an express mode, it has also planned introduction of – Multi Modal Integration in these two cities. The concept of Multi Modal Integration envisages assimilation of multiple modes of transport to help commuters to reach from one place to another. The modes which are planned to be integrated include metro train, local bus service, e vehicles, taxi service etc. Bike sharing would be an integral part of this feeder service. This integration would help commuters to reach either Metro Station, work area of residence using any of the above-mentioned transport modes and then travel further using Metro train. This will ensure Last Mile Connectivity across the city.

Rail Analysis India: Please brief us that how manufacturing 75% of metro components indigenously would provide a big boost to the railway industry of India?

Dr. Brijesh Dixit: In the year 2017, Government of India launched the Make in India initiative and the new Metro Rail Policy. By virtue of the 'Make-in-India' policy of Government of India, it has been mandated to manufacture 75% of metro components indigenously. This policy driven initiative would not only bring in the latest manufacturing technology and best practises as a boost to the railway industry but also establish a good, robust and competitive manufacturing base in India. Such an initiative would also lower the manufacturing cost of metro components as India does offer a low-cost manufacturing ecosystem.

Since the rapid urbanisation occurring in the country demands city transport development in the form of an urban metro rail system, it is fully relevant and important to optimize the manufacturing cost of metro components.

Furthermore, this GOI initiative would also boost the economic growth of the country and generate significant number of jobs which are essentially required to contain unemployment in the country.

Rail Analysis India: What are your views on the progress of metro projects in India in last 4 years?

Dr. Brijesh Dixit: During the last 4 years, a significant amount of operational metro rail network has been added in the country. Also, a lot of new projects have started construction, and some are in the stage of preparation of DPR. This healthy progress signifies the willingness of people to shift from private transport to public transport. This shift from private transport to public transport is sustainable in the long run. This will make cities in India livable as metro project is environment friendly and viable.

Launching of Segments at Rachana Ring Road - Reach 3 - Nagpur Metro Rail Project

Rail Analysis India: What are the future plans of the metro projects in Maharashtra and additional phases of Pune and Nagpur metro? What role can Foreign and Private Indian companies have in developing these projects in terms of supply of components, parts etc?

Dr. Brijesh Dixit: Even as work on the first phase is going on in a rapid pace, the proposal and demands for second phase re on the rise. Following are some such proposals and demands:

Nagpur – The second phase of Nagpur Metro Project has been conceived. It includes 35 stations and covers a distance of 48.3 km. This basically involves providing connectivity to surrounding areas and industrial townships. It encompasses providing Metro rail links to areas like Kanhan, Hingna, Butiboti, Dattawadi and Transport Nagar. Detail Project Report (DPR) for this has been submitted to Urban Development Department (UDD), Government of Maharashtra.

Pune – Similarly, Maha Metro has received requests for extension of the existing project alignment from local bodies of Pune. The demand for this includes the one from Pimpri Chinchwad to Nigdi, which covers a distance of 7 km, Swar Gate to Katraj (Pimpri Chinchwad) with a distance of 7 km and Nashik Fata to Chakan via Moshi, which spreads over a distance of 25 km. These proposals are under consideration.

Thane – While work on Nagpur and Pune projects is on the fast track, Maha Metro was entrusted with the task of preparing DPR for Thane.

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- 14 September, 2018 An Exclusive Interview with Mr. Francesco Lombardo, Business Development Manager, Lucchini RS, Italy

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Foundation stone for Thane-Bhiwandi-Kalyan Metro-5 Corridor to be laid on December 18, 2018; India

13 December, 2018 by Team - Rail Analysis India
Team - Rail Analysis India

Date of Post: 13 Dec, 2018

Mumbai: Prime Minister Narendra Modi will lay the foundation stone for Thane-Bhiwandi-Kalyan Metro-5 corridor on December 18. The 24km long Metro-5 corridor will have 17 stations. The metro corridor, which is estimated to cost Rs 8,416 crore, will connect Thane, Bhiwandi and Kalyan in the eastern suburbs.

More Information:

- The 24-km long metro corridor is expected to carry around 2.29 lakh commuters daily in 2021 with the entire system designed for 6-coach trains.
- It will be totally an elevated corridor.

- The 17 Stations on the route are –
  - Kalyan APMC
  - Kalyan Station
  - Sahajanand Chowk
  - Durgadi Fort
  - Kon Gaon
  - Gove Gaon MIDC
  - Rajnouli Village
  - Temghar
  - Gopal Nagar
  - Bhiwandi
  - Dhamankar Naka
  - Anjur Phata
  - Purna
  - Kalher
  - Kasheli
  - Balkumbh Naka
  - Kapurbawdi
- The line was approved by the Maharashtra Cabinet on 24 October 2017.

Agency approved for operations and maintenance of Metro Lines-

- Maharashtra Chief Minister Devendra Fadnavis recently approved setting up of Mumbai Metro Operation Corporation Ltd for the operations and maintenance of the Mumbai Metro rail.
- "The establishment of Mumbai Metro Operation Corporation Ltd. is another step forward as the State expects to throw open Andheri (East) to Dahisar (East) Metro-7 and Dahisar to DN Nagar Metro-2A corridors next year," a release in MMRDA said.
- The Corporation will be an autonomous body and will deal with operation and maintenance of Metro Lines as also Monorail, it said.

To know more about recent developments of Mumbai Metro –

10 Dec, 2018: Alstom to provide CBTC signalling system for Mumbai Metro Line 3

23 Nov, 2018: BEML bags Rs 3,015 crore order for manufacturing of 378 Metro cars for Mumbai Metro Corridor 2A, 2B & 7

23 Nov, 2018: Mumbai Metro Operation Corporation Ltd. approved for operations and maintenance of Metro Lines

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- 6 September, 2017 Union Home Minister Rajnath Singh & UP Chief Minister Yogi Adityanath Flags Off The Lucknow Metro | Here is Everything You Need To Know

ICF likely to roll out 10 more 'Train 18' Trainsets by next Year; India

12 December, 2018 by Team - Rail Analysis India
Team - Rail Analysis India

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Date of Post: 12 Dec, 2018

The Integral Coach Factory (ICF), Chennai hopes to make 2 more trainsets in Train 18 design this fiscal and ramp it up to 8 in the next, a top official said. "ICF will try to make 2 more Train 18 trainsets this financial year and up to 8 in the next financial year depending on the allotment from the Railway Board," Sudhanshu Mani, General Manager, ICF, said.

More Information:

- The cost of the trainset is set to go down in a gradual manner as the volumes go up.
- The prototype of a Train 18 trainset cost Rs 100 crore.
- Meanwhile, the ICF got the approval of the Railway Board for rolling out 4 more Train 18 trainsets this fiscal.
- The Board made the decision at its meeting held on December 5.
- The ICF will be informed about the needed changes in its production programme, it said.
- The ICF has been asked to make the necessary arrangements for sourcing of material and schedule manufacturing activities to achieve the target.

About 'Train 18'

- The Train 18 prototype which is currently on trial, is a high-tech, energy efficient, self-propelled train set to replace the Shatabdi Express.
- It has aerodynamically designed driver cabins at both ends for quicker turnaround at destinations.
- Every alternative coach is motorised to ensure even distribution of power and faster acceleration or deceleration, according to the ICF.
- The fully air-conditioned 16-coach train sports an advanced regenerative brake system which saves power.
- There are also emergency talk-back units, through which passengers can talk to the crew in case of emergency.
- CCTVs are provided in all coaches for safe and secure travel.
- Among the features that enhance passenger comfort are-
    - Inter-connected fully sealed gangways
    - Automatic doors with retractable footsteps

- Onboard Wi-Fi and infotainment
- GPS-based passenger information system
- Modular toilets with bio-vacuum systems
- Rotational seats which can be aligned in the direction of travel (available only in the executive class)
- Roller blinds and diffused LED lighting
- Disabled-friendly toilets

- The train 18 was conceived, designed and developed in about 18 months' time as against the industry norm of about 4 years, the ICF officials said.

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11 Dec, 2018: Titagarh Wagons bags Rs 1,561 crore order from Indian Railways for supply of wagons

10 Dec, 2018: Indian Railways Constructing World's Tallest Railway Bridge in Manipur

10 Dec, 2018: Indian Railways selects 5 players through reverse-auction method to supply over 12,000 wagons

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- 28 November, 2018 Indian Railways to induct 4,016 LHB coaches with anti-collision technology this fiscal

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- 16 November, 2017 Western Railway Plans To Install CCTV Cameras & Talk-Back System In Women's Compartment Inside All Suburban Trains At around Rs 123 Crore
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- 15 June, 2018 Railways To Upgrade Coaches of Superfast & Mail Expresses Under 'Project Utkristh'
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- 25 September, 2017 MRVC Exploring Possibility Of Getting Suburban Trains On Lease Under The Third Phase
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- 30 November, 2018 First Set of New Tejas Coaches to be Rolled Out

Ahmedabad Metro Update: First Train of 3 Coaches to reach City by December 31 2018; India

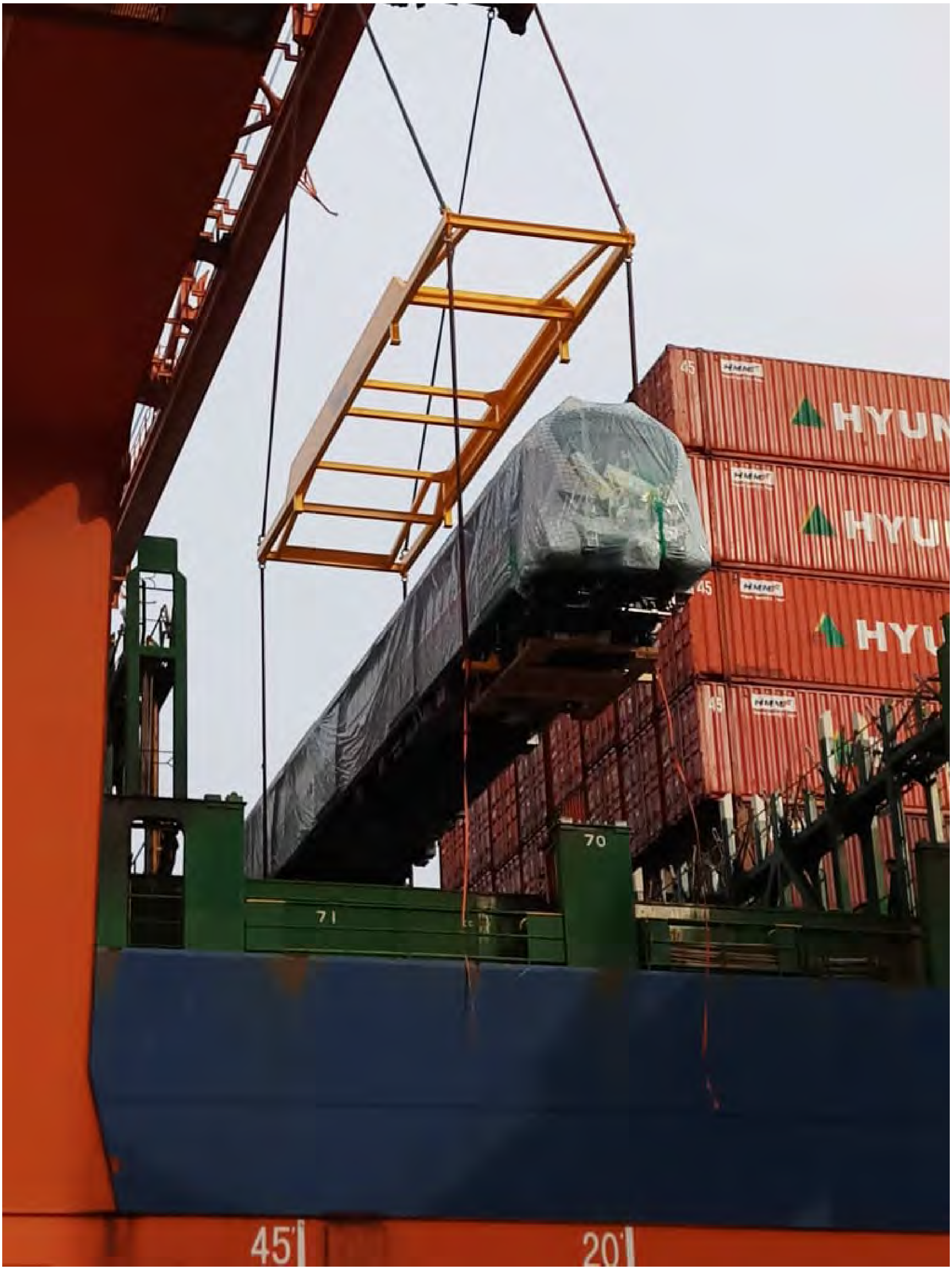
8 December, 2018 by Team - Rail Analysis India
Team - Rail Analysis India

Date of Post: 08 Dec, 2018

<u>Ahmedabad:</u> The first train of 3 coaches for Ahmedabad Metro Rail project have been shipped out from South Korea and will be reaching Mundra port by December 31, according to reports. A test run is expected later in the same month.

More Information:

- "The first train will reach the Apparel Park depot by 2 January, 2019. We will take about 10 days to assemble it and conduct some tests. It will be ready for a trial run before or during the Vibrant Gujarat summit," IP Gautam, Managing Director of MEGA (Metro-Link Express for Gandhinagar and Ahmedabad Company Ltd), qouted as saying in the report.
- A South Korean firm that won the Rs 1,025 crore contract will supply a total of 32 trains (36 coaches) for phase-I of the project, The Indian Express reported.



- The first trial run of the Ahmedabad-Gandhinagar metro rail project will take place on the 6.5 km stretch between Vastral and Apparel Park.
- The stretch is the part of the 20.73km long East-West Corridor of the Ahmedabad Metro Rail Project that proposes to connect Vastral area in east Ahmedabad with the western suburb of Thaltej.
- The entire project will be ‘up and running’ by 2020.

- In first phase, which is estimated to cost Rs 10,773 crore, the metro will connect suburbs in Ahmedabad along east-west and north-south axis.

All image credit: **Avinash Nair**

To know more about recent Developments of Ahmedabad Metro –

23 Aug, 2018 : Ahmedabad Metro Update: 1st Trial Run On 'Priority Reach' Between Vastral village and Apparel Park To Begin in January 2019

08 Oct, 2018: Ahmedabad Metro Update: First Trial Run of Ahmedabad Metro Rail to Take Place in January 2019

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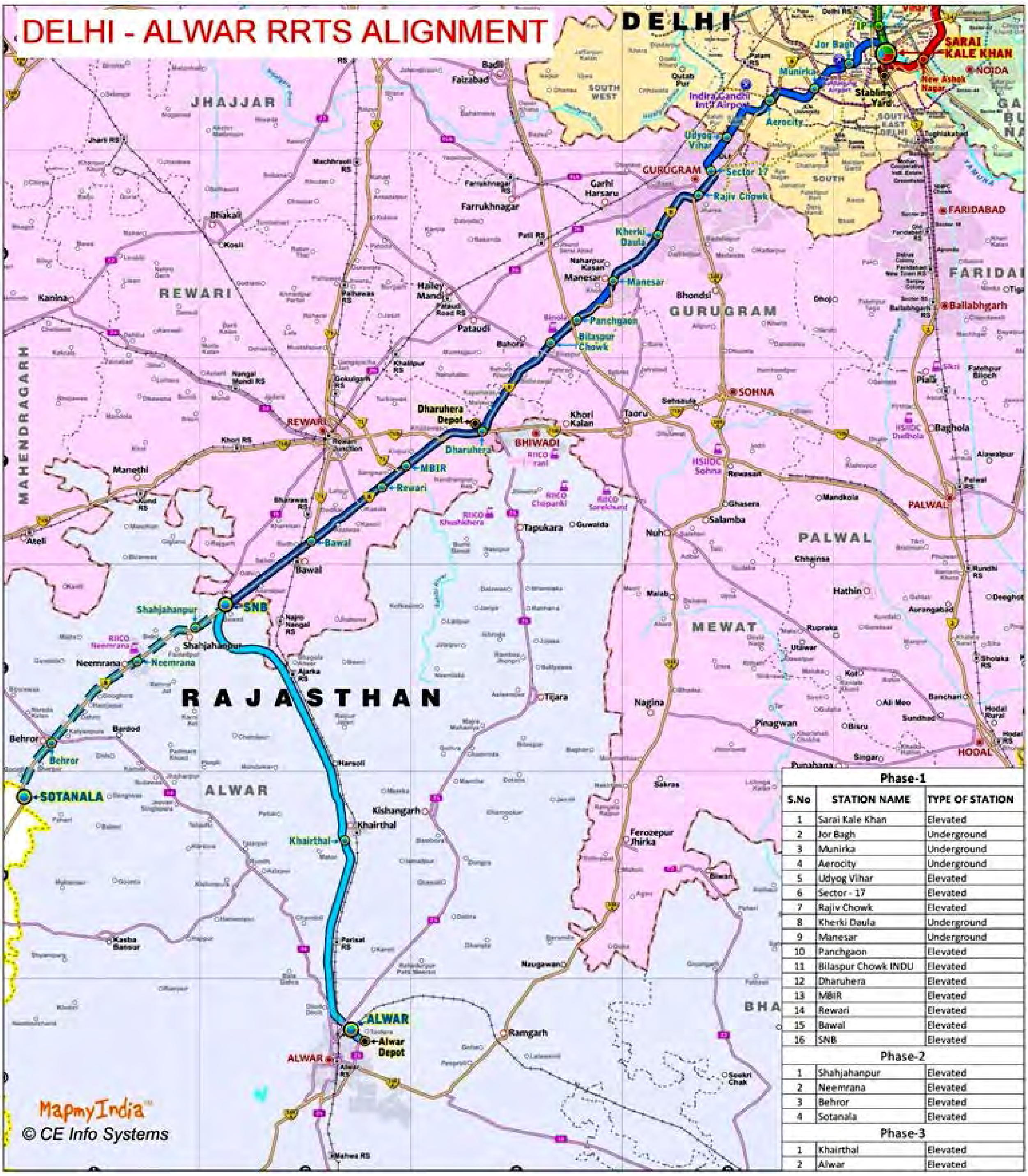
NCRTC approves DPR of Delhi-Gurgaon-SNB RRTS Corridor; India

8 December, 2018 by Team - Rail Analysis India
Team - Rail Analysis India

Date of Post: 08 Dec, 2018

The NCRTC (National Capital Region Transport Corporation) has approved the Detailed Project Report (DPR) of Delhi-Gurgaon-SNB (Shahjahanpur-Neemrana-Behror Urban Complex) RRTS corridor, an official said. The 106 kms corridor will be elevated for around

71 km consisting of 11 stations, while the remaining 35 km, having 5 stations, will be underground mostly in Delhi and Gurgaon, according to the NCRTC's official.



S.No	STATION NAME	TYPE OF STATION
Phase-1		
1	Sarai Kale Khan	Elevated
2	Jor Bagh	Underground
3	Munirka	Underground
4	Aerocity	Underground
5	Udyog Vihar	Elevated
6	Sector - 17	Elevated
7	Rajiv Chowk	Elevated
8	Kherki Daula	Underground
9	Manesar	Underground
10	Panchgaon	Elevated
11	Bilaspur Chowk INDU	Elevated
12	Dharuhera	Elevated
13	MBIR	Elevated
14	Rewari	Elevated
15	Bawal	Elevated
16	SNB	Elevated
Phase-2		
1	Shahjahanpur	Elevated
2	Neemrana	Elevated
3	Behror	Elevated
4	Sotanala	Elevated
Phase-3		
1	Khairthal	Elevated
2	Alwar	Elevated

More Information:

- The DPR was approved at a Board meeting of the NCRTC, chaired by Housing and Urban Affairs Secretary Durga Shanker Mishra, on Thursday.
- The central government has planned 3 RRTS corridors – Delhi-Ghaziabad-Meerut, Delhi-Gurgaon-Alwar and Delhi-Sonipat-Panipat to enable fast commute from cities around Delhi in the NCR.
- The Delhi-Gurgaon-SNB is a part of Delhi-Gurgaon-Alwar of the Regional Rapid Transit System (RRTS) corridor, which is planned to be implemented in 3 stages.
  - In the 1st stage, Delhi-Gurgaon-Rewari-SNB Urban Complex will be constructed.

  - In the 2nd stage, it will be extended from SNB Urban Complex to Sotanala.
  - In the 3rd stage SNB Urban Complex to Alwar will be constructed.
- Official said,"The Delhi-Alwar will converge with other RRTS corridors in Sarai Kale Khan and will be interoperable, facilitating commuters' movement from one corridor to another without the hassle of changing trains."
- As per the plan, RRTS trains, with design speed of 180 kmph, operation speed of 160 kmph and average speed of 100 kmph will be available at a frequency of every 5-10 minutes.
- The infrastructure is being designed for up to 9 coaches trains which will be air-conditioned with transverse seating and overhead luggage space for commuter comfort.
- This RRTS smart line will pass through the urbanised and industrialised areas of Haryana and connect the Delhi airport with the RRTS network, increasing the overall productivity of NCR.

To know more about recent developments of RRTS –

05 Dec, 2018: Bids invited for Widening of road for Delhi-Ghaziabad-Meerut RRTS Corridor

13 Nov, 2018: RRTS Project Along Haryana-Rajasthan to Get Major Boost Next Year

13 Nov, 2018: Innovative Measures Proposed to be Adopted at Sarai Kale Khan RRTS for Commuters Movement

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**Author:**

Narinder Sharma is a part of the content team of Rail Analysis India as a writer and marketing executive.
His interest is in the Railways , Metro and Transportation Sector of India .
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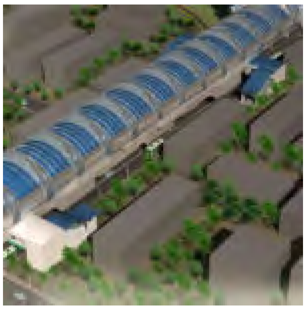
- 
- 25 October, 2017 Delhi-Ghaziabad-Meerut RRTS Update: GDA and NCRTC To Jointly Carry Out Survey For Developing Six Stations In Ghaziabad
- 
- 25 June, 2018 RRTS Update: Centre Approves 2 RRTS (Regional Rapid Transit System) Projects for Haryana
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- 14 August, 2018 RRTS Update: Center To Help Delhi Government in Securing Loans for Funding Delhi-Meerut RRTS Project
- 
- 3 November, 2017 Central Government Approves RRTS (Rapid Rail Transport System) Project In Uttar Pradesh

Maharashtra Cabinet approves Rs 55,000 crore Mumbai Urban Transport Project-3A; India

7 December, 2018 by Team - Rail Analysis India
Team - Rail Analysis India
.**Date of Post:** 07 Dec, 2018

Mumbai: The Maharashtra Cabinet on Wednesday approved the Rs 55,000 crore Mumbai Urban Transport Project 3A (MUTP-3A), moved one step closer to implementation of several big-ticket rail infrastructure projects.

Some of the major projects covered under MUTP-3A include-

- CSMT-Panvel elevated fast corridor (Rs 12,331 crore)
- New Virar-Panvel corridor (Rs 7089 crore)
- Procurement of 210 air-conditioned EMUs (Rs 17,374 crore)
- Extension of Harbour line between Goregaon and Borivali (826 crore)
- Implementation of new CBTC (Communications-Based Train Control) signalling system
- Introduction of 2 more lines between Borivali and Virar
- Upgradation & modernisation of 16 suburban stations.

More Information:

- With the cabinet nod in place, the proposal will now be sent to Railway Board and Niti Aayog.
- Following an Extended Board Review, it will be placed before the Cabinet Committee of Economic Affairs (CCEA) for final approval.
- The cabinet also issued a Government Resolution (GR) pertaining to the relocation and rehabilitation of people affected by the project, which will be done on the lines of earlier MUTP projects.
- As far as funding is concerned, MRVC (Mumbai Railway Vikas Corporation), the nodal agency of the project, will raise around Rs 14,000 crore through loans from banking institutions.
- MRVC is expected to approach a consortium of banks, including the New Development Bank (NDB) and the Asian Development Bank (ADB) for the loan.
- The remaining cost will be shared between the Railways and the Maharashtra Government on a 50:50 basis.

To know more about recent developments of Railways–

06 Dec, 2018: Indian Railways creates history by converting diesel locomotive to electric traction

01 Dec, 2018: Indian Railways gets first stretch of land for Bullet train project in Gujarat

29 Nov, 2018: Indian Railways delivers 13 Diesel Multiple Units (DMUs) coaches to Sri Lanka

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Narinder Sharma is a part of the content team of Rail Analysis India as a writer and marketing executive.
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- 25 January, 2018 Indian Railways To Invest Rs 48,000 Crore To Boost Infrastructure In Northeast

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- 19 November, 2018 Managing Director Reviews the Work of Sachivalaya Metro Station
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- 20 April, 2018 Construction Work On Bullet Train Project Between Mumbai & Ahmedabad To Begin In January 2019
- 
- 22 January, 2018 Union Railway Minister Sh. Piyush Goyal & Road Transport Minister Sh. Nitin Gadkari Agrees On Speedy Clearances For Infrastructure
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- 19 September, 2018 PM Narendra Modi and Bangladesh PM Sheikh Hasina jointly inaugurate two railway projects
- 
- 7 September, 2017 Extension Of Multi Model Transport System Phase-2 From Ghatkesar To Raigir Cleared

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- 26 June, 2018 Rs 18,795 Crore Railway Projects Under Implementation Under “Sagarmala” Initiative

Alstom to increase Production in its Facility at Sri City in Andhra Pradesh; India

7 December, 2018 by Team - Rail Analysis India
Team - Rail Analysis India

Date of Post: 07 Dec, 2018

Chennai: France-based Alstom, on Thursday announced a plan to increase production in its facility at Sri City, near Chennai in Andhra Pradesh. On the capacity of the unit, Alain Spohr managing director of Alstom (India and South Asia) said, “Today, we have the capacity to produce 20 cars per month. We will add 4 more cars to make it 24.”

More Information:

- Spohr said,”We are going to set up a new line for 20 cars to take the capacity to 44 cars. This will happen in 2019-end.”
- He declined to reveal the proposed investments to expand the facility.
- However, the employees at the facility would increase to 1,000 from the existing 450 following the increase in production, he said.
- Alstom won an order to make 248 metro cars for Mumbai Metro Rail the production of which would begin in November 2019 and delivery in 2021-22, Spohr said.
- The company had won the Rs 2,500-crore order in June 2018 for 31 trains with 8 cars, he said.
- Earlier, Alstom flagged off the last set of the 22 six-car train for Sydney Metro and unveiled the communications-based train control signalling system for North West Rail Link, Australia.
- The facility at Sri City commenced production in 2014 and has a capacity of producing 240 cars annually.
- The unit had also delivered metro trains to Chennai, Kochi and Lucknow.
- An official said that the factory would begin work on the 2nd export order for light metro project in Montreal, Canada, early 2019.

To know more about recent developments of Metro in India–

06 Dec, 2018: Alstom successfully delivers last train for Sydney Metro

06 Dec, 2018: Upcoming underground stations of Bangalore Metro Rail to have Platform Screen Doors

05 Dec, 2018: Second phase of Aqua Line Metro link approved costing Rs. 2,602 Crores

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Deepak Kumar is a part of the content team of Rail Analysis India as a writer and analyst . His focus is on new initiatives on the Railway Sector of India . Please reach us at editor@railanalysis.com for more information .

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- 29 November, 2018 Indian Railways delivers 13 Diesel Multiple Units (DMUs) coaches to Sri Lanka
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- 12 July, 2018 India To Export 6 DMU (Diesel Multiple Units) Train Sets Worth Rs 600 Crore To Sri Lanka
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- 28 October, 2017 Schindler India Plans To Invest Rs 100 crore To Set Up Escalator Manufacturing Facility At Its Chakan Plant In Pune
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- 10 August, 2017 Pune Metro Rail Project To Get €245 million as fund from AFD

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- 29 June, 2018 Kalpataru Power Transmission Limited (KPTL) Secures New Orders Worth Rs 1,235 Crore
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- 19 June, 2017 IRCTC Floated Tenders For Catering Facilities At 4 Stations

Second Phase of Aqua Line Metro Link approved costing Rs. 2,602 Crores; India

5 December, 2018 by Team - Rail Analysis India
Team - Rail Analysis India
.**Date of Post:** 05 Dec, 2018

The Greater Noida Industrial Development Authority (GNIDA) on Tuesday approved the second phase of the Aqua Line Metro link from Noida Sector 71 to Knowledge Park-V in Greater Noida. The extension will cost Rs. 2,602 crore, officials said. This decision was taken at the Authority's 113th board meeting.

More Information:

- NMRC would be the nodal agency for the project.
- The project will be carried out in two phases.
- There will be a total of 9 metro stations on the route, 5 stations in the first phase and 4 stations in second phase.
- The first phase of the project from Noida Sector 71 to Greater Noida Sector 2 is expected to cost around Rs 1521 crore, officials said.
- Of the 9 metro stations, 2 will be in Noida and 7 will be in Greater Noida.
- The stations in Noida are sectors 122 & 123 and the stations in Greater Noida are sector 4, Ecotech 12, sectors 2, 3, 10, 12 and Knowledge Park-V.
- "The Detailed Project Report (DPR) for the project has been approved by the government and we will kick-start the construction of first phase soon," GNIDA Chairman and Chief Secretary of Uttar Pradesh Government, Anup Chandra Pandey said.
- Both Noida and Greater Noida authorities will bear the cost of the construction of the proposed metro line.

To know more about recent developments of Noida Metro-

24 Nov, 2018: PM Modi to Inaugurate Noida-Greater Noida Metro corridor and Delhi Metro's Red Line extension on December 25

22 Nov, 2018: Tenders floated for E-rickshaw service at all 21 stations on Noida-Greater Noida Metro Corridor

21 Nov, 2018: Co-branding Rights for 3 Stations on Noida-Greater Noida Metro Corridor Awarded

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- 5 May, 2017 [KIIFB to fund in second phase development of the Vyttila Mobility Hub]
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- 4 October, 2017 [Ghaziabad Metro Update: Housing Development Council Releases Rs 31 crore As Second Installment Of Its Contribution For Metro Rail Project in Ghaziabad]
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- 25 April, 2017 [YEIDA decides to revive the high-speed Metro link project between Greater Noida – Jewar airport]

- 20 November, 2018 Metro rail project in Surat likely to be launched in 2019

- 7 December, 2018 Visakhapatnam Metro Update: Special meeting conducted to discuss progress of Visakhapatnam Metro project

- 11 December, 2018 DMRC board approves Phase-4 project revised at Rs 46,800 crore

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METRO Newsletter by Dr. F.A. Wingler
METRO 09, December 2018

Alstom Citadis Street Tram for Avingon, France

ACTIVITIES FOR URBAN MOBILITY SOLUTIONS INTERNATIONAL

Israel announces Three-Line Tel Aviv Metro Network; Israel

Dec. 14, 2018
Written by Jeremaya Goldberg

A metro network consisting of three lines will be built in Tel Aviv, Israel's minister of transport and intelligence, Mr Yisrael Katz, announced on December 12.

The Tel Aviv metro network is estimated to cost between Shekels 100 – 150bn ($US 26.5 – 39.7bn) with more than 130km of underground lines and more than 100 stations. Ridership is estimated at 1.5 million passengers a day and 450 million a year, with trains operating with a headway of 3-4 minutes.

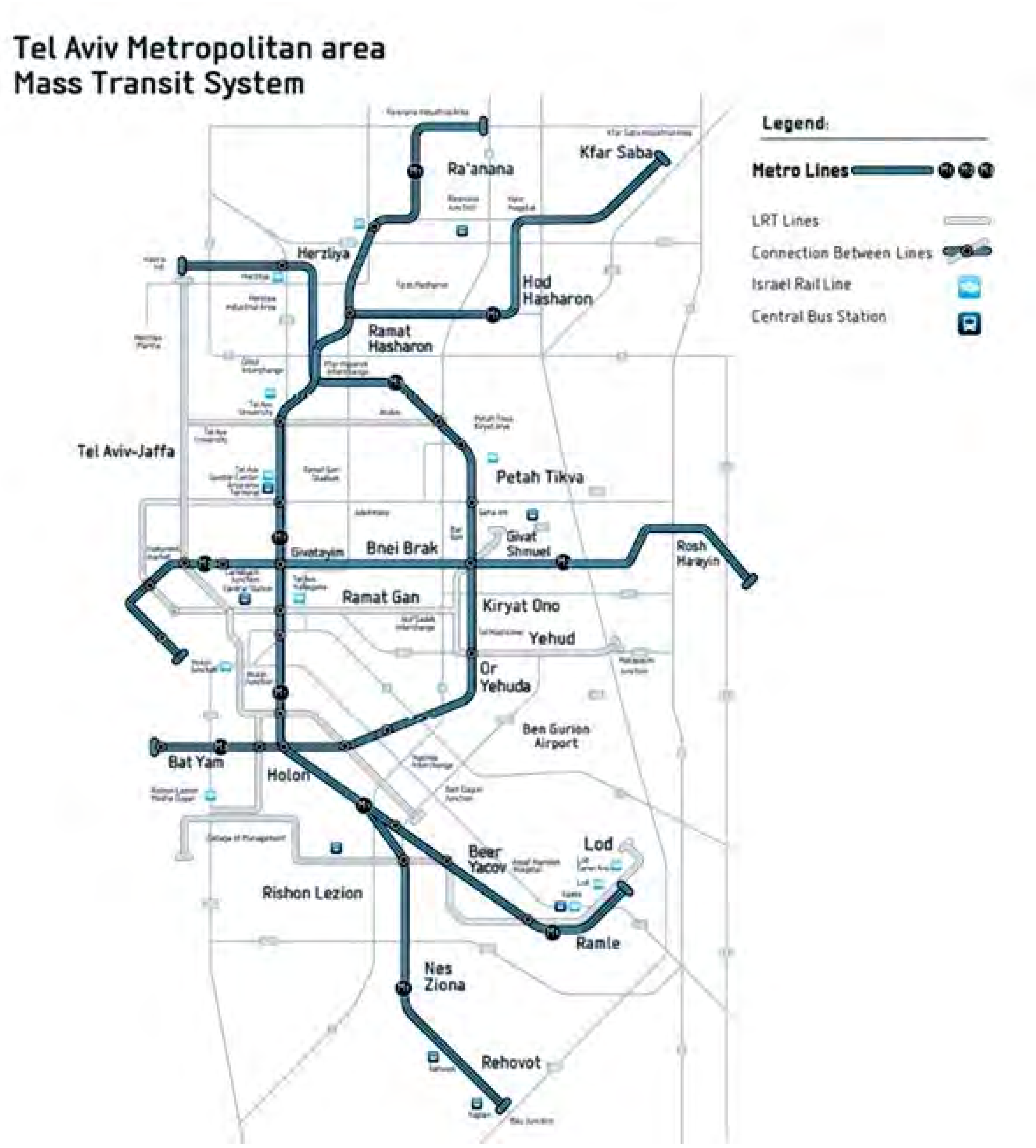
The metro network will be built in addition to the three light rail lines currently under construction.

The first 73km north-south line will serve the cities of Raanana, Herzliya, Ramat Hasharon, Kfar Saba, Hod Hasharon, Tel Aviv, Bat Yam, Holon, Rishon Lezion, Ness Ziona , Rehovot, Beer Yaakov, Ramle and Lod, as well as future development areas, including IMI, Sharon Junction, Glilot Junction, Holon and Tzrifin.

The second 25km east-west line will serve the cities of Rosh Ha'ayin, Petah Tikva, Ramat Gan, Givatayim and Tel Aviv, as well as future development areas including the Sirkin area.

The third 32km line is a semi-circle line that will connect the network and will serve the cities of Bat Yam, Holon, Azor, Or Yehuda, Givat Shmuel, Petah Tikva, Tel Aviv, Ramat Hasharon and Herzliya, as well as future development areas including Galil Yam and West Ramat Hasharon, Tel Hashomer and Or Yehuda.

The Ministry of Transport and the Tel Aviv Metropolitan Mass Transit System (NTA) presented the plan to the National Infrastructure Committee on December 12. The NTA noted that it intends to examine further extensions to the network.



CRRC Sifang to supply Cairo interurban EMUs; Egypt

Dec 6, 2018

Written by David Burroughs

CRRC Sifang and a consortium of China's Avic International and China Railway Group signed a contract on December 3 to supply 22 trains for the inter-urban light rail line between Cairo and 10th of Ramadan City.

Egypt's National Authority for Tunnels (NAT) awarded the consortium a contract in 2017 to construct the 66km 11-station line to connect Cairo with El Obour City, El Shorouk City, Badr City, and 10th of Ramadan City. The line is forecast to carry around 340,000 passengers per day, reducing traffic on the Cario – Ismailia highway by around 30%.

CRRC Sifang will supply six-car EMUs with a design speed of 120km/h for operation on the line, while the contract also includes 12 years' maintenance. CRRC says the EMUs will be adapted for use in the Egyptian environment, with low noise emission and a high passenger capacity.

CRRC Sifang says the project is a major achievement under the "One Belt, One Road" initiative, which it says will support its expansion into the North African market.

For more information on rail projects around the world, subscribe to IRJ Pro.

Categories: Light RailMiddle EastNews
Tags: CairoCRRC CorporationEgypt

Contract awarded for Riyadh Metro Airport Extension; Saudi Arabia

Oct. 18, 2018
Written by Keith Barrow

ARRIYADH Development Authority has awarded the FCC-led Fast consortium a contract to build a 1.5km extension of Riyadh metro Line 4 to serve King Khalid International Airport.

Construction of the main Section of Line 4, Riyadh Metro, is at an advanced Stage

The extension will run on viaduct for its entire length with two stations, one for terminals 1 and 2 and the other for terminals 3 and 4.

Fast was awarded a contract in July 2013 to build and equip lines 4, 5 and 6, which have a total length of 64.5km with 29 stations, 30km of viaduct and two depots.

FCC's partners in Fast include Alstom, Atkins, Freyssinet Saudi Arabia, Samsung C&T, Setec, Strukton and Typsa.

Categories: MetrosMiddle EastNews
Tags: AlstomFCCRiyadhSaudi Arabia

First Alstom Dubai Metro Train set for November delivery; Emirates

Sep. 24, 2018

Written by Keith Barrow

THE chairman of Dubai Roads and Transport Authority (RTA), HE Mattar Al Tayer, visited Alstom's plant in Katowice in Poland last week for a test run on one of the first Alstom Metropolis trains for the Dubai metro.

Al Tayer says the first train will arrive in Dubai in November, with the final set due for delivery in November 2019.

As leader of the ExpoLink consortium, Alstom is supplying 15 driverless trains for the Route 2020 project, which involves building a 15 km branch from Nakheel Harbour and Tower station on the Red Line to the Expo 2020 exhibition site in Jebel Ali, and 35 sets to supplement the existing fleet of 79 trains, which were built by Kinki Sharyo for the first phase of the network.

While the interior and exterior design identity of the original trains is retained, the Alstom trains feature a number of improvements, including redesigned grab handles, lighting, and passenger information systems. The trains will be equipped with LED dynamic route maps, and the luggage area has been redesigned to make it suitable for standing passengers.

Women and children class is extended to an entire vehicle, with Gold Class occupying part of one of the outer cars. Seating will be transverse in Gold Class and longitudinal through the rest of the train.

According to RTA, the Alstom trains will accommodate 696 passengers, compared with 643 passengers for the existing trains.

Categories: MetrosMiddle EastNewsRolling stock

Tags: AlstomDubaiRTAUAE

Hitachi Launches Joint Bid for Tyne and Wear Metro Trains; UK

12 Dec. 2018 | Railway News

Hitachi has joined forces with Spencer Group to bid for a 500 million pound contract to build new Tyne and Wear metro trains along with a maintenance centre.

One of the current Tyne and Wear Metro Trains © Paul Robertson under licence

Hitachi and engineering company Spencer Group have joined forces to build the rolling stock for the Tyne and Wear metro that is to replace the existing trains starting in 2022. These new metro trains will be much more high-tech. In addition, the two companies will build a depot near Newcastle where these new trains can be maintained.

Northern Powerhouse Rail Partnership

Both Hitachi and Spencer Group have a presence in northeast England. For example, Hitachi builds trains in County Durham. Spencer Group, meanwhile, is based in Hull. The two companies are keen to highlight this feature as the north of England has attracted political attention. Once an industrial area, it has seen a decline in its industries and the British government is seeking to revive the region.

Hitachi and Spencer Group feel their presence in the north of England will help them in their bid. Hitachi says it has created more than 700 permanent jobs at its train factory in Newton Aycliffe in addition to supporting thousands more through its British supply chain. In total, Hitachi has spent more than 628 million pounds with UK suppliers. In particular, 70 percent of train parts come from within 40 miles of the Newton Aycliffe facility.

Spencer Group employs 300 people in the north of England.

Ross Nagle, Chief Operating Officer for Manufacturing at Hitachi, said:

“Our train building team in the North East is delivering truly world class trains already carrying millions of passengers around the country. We are now working hard to secure more orders, so our investment in the North East economy will continue to be felt across the region and with our local suppliers.”

Gary Thornton, Managing Director of Spencer Group, said:

“Our partnership with Hitachi to bid for the contract with Tyne and Wear Metro builds on our successful relationship delivering major rail projects. Together we offer a compelling proposition of complementary engineering expertise that will deliver unrivalled benefits to the client and value to the economy of the North.”

Current Tyne and Wear Metro Trains and Contract Bidders

The current Tyne and Wear metro trains (British Rail Class 994) have been in use since 1980. The fleet consists of 90 trains that most recently underwent refurbishment between 2010 and 2015.

Tyne and Wear metro operator Nexus announced the shortlist of companies for the rolling stock contract in September. They are Bombardier, CAF, Hitachi, Stadler Rail and a Downer EDI Rail-CRRC consortium. Nexus want to decide on their preferred bidder by the end of the year.

Grand Avignon Gets Its First Alstom Citadis X05 Tram; France

13 Dec. 2018 | Railway News

Grand Avignon, France, received its first Alstom Citadis X05 tram on 13 December. It took the tram three days to travel from its assembly site in La Rochelle. Alstom engineers also designed the Citadis tram at the La Rochelle facility. Overall, Alstom is contracted to deliver 14 trams to Grand Avignon. They are to enter service in the summer of 2019.

Jean-Baptiste Eyméoud, President of Alstom in France*, said:*

"Alstom and its teams are proud to present this first tram which addresses the major transport issues of the Agglomeration Community of Grand Avignon. We always take great pleasure in showcasing the knowhow and technologies deployed by Alstom's men and women, for our customers in France and around the world."

Alstom Citadis X05 for Grand Avignon © Alstom / Yves Ronzier

Alstom Citadis X05 Specifications

Each tram is 24 m long and features four double doors on both sides. Alstom’s trams for Grand Avignon have a capacity of over 140. Furthermore, all the lighting in the trams is LED lighting, complete with diffusers to produce a soft, homogeneous effect. The large windows, which cover 40 percent of the tram, further contribute to the positive passenger experience. The Alstom Citadis X05 benefits from standardised components that have stood the test of time. Importantly, they are accessible to passengers with reduced mobility. The environmental credentials should also be mentioned: the Citadis X05 is highly energy efficient. Up to 98 percent of it is recyclable.

In addition to Alstom’s La Rochelle plant, six other Alstom sites are participating in this contract. They are: Ornans (for the engines), Le Creusot (for the bogies), Tarbes (for the traction drives), Valenciennes (for the control system and interior layout), Saint-Ouen (for the design) and Villeurbanne (for the onboard electronic systems).

The Alstom Citadis is a popular tram. The rolling stock manufacturer has sold more than 2,600 worldwide, to more than 50 cities. For example, the cities of Nice, Sydney, Lusail and Caen have all placed orders with Alstom for Citadis X05 trams.

Read: Alstom’s Citadis X05 Tram Begins Operations in Nice

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METRO Newsletter by Dr. F.A. Wingler
METRO 10, December 2018

Monorail, Mumbai; India

PART I: ACTIVITIES FOR URBAN MOBILITY SOLUTIONS IN INDIA

Scomi Mumbai Monorail Contract terminated; India

Corporate News
Monday, 17 Dec 2018
7:49 PM MYT

MONO RAIL MUMBAI

KUALA LUMPUR: Scomi Group Bhd

The company, in a filing with Bursa Malaysia on Monday, said Mumbai Metropolitan Region Development Authority (MMRDA) via a letter dated Dec 14 has terminated the contract awarded to the consortium, in which Scomi is a partner.

The Mumbai monorail project was awarded to Scomi Engineering Bhd

image: https://cdn.thestar.com.my/Themes/img/chart.png

and its Indian partner Larsen and Toubro Ltd on Nov 7, 2008.

"The company is discussing with its consortium partner with a view to fully enforce the consortium's rights under the contract in respect of the notice of termination, including taking all necessary legal proceedings on the advice of its solicitors," Scomi said.

It also said the financial impact of the termination for the financial year ended March 31, 2019 would depend on the outcome of the legal proceedings.

"The company will continue to provide updates from time to time on any further material development on this matter," it said.

In November, Scomi said it has completed work for phase two of the Mumbai monorail project and in September has commenced operations and maintenance on phase 1.

Tags / Keywords:**Corporate News** , **Scomi**

Read more at https://www.thestar.com.my/business/business-news/2018/12/17/scomi-mumbai-monorail-contract-terminated/#csXYSdqxhyRKx8m2.99

PART II: ACTIVITIES FOR URBAN MOBILITY SOLUTIONS INTERNATIONAL

MTA selects DXC to revamp Asset Management System; USA

December 18, 2018
Commuter/Regional, News, OFF Track Maintenance, Rapid Transit/Light Rail, Supplier News

Written by Kyra Senese, managing editor

File photo

DXC Technology (DXC) has been selected by the New York Metropolitan Transportation Authority (MTA) to transform its enterprise asset management capabilities and support its digital transformation.

The multi-year engagement will allow DXC to deploy a next-generation enterprise asset management (EAM) solution to help the MTA plan, track and optimize maintenance activities of MTA assets and infrastructure for its 236 route miles.

Transportation organizations in general, especially public sector agencies, have often formed through the merger of smaller agencies, said Christopher Lund, partner, digital industry consulting at DXC Technology.

“In the case of the MTA, they have acquired a number of agencies that go back to the mid-1800s, when they were competing public transportation systems within the metropolitan New York area,” Lund explained. “As it’s grown together and matured into what it is today, these various segments that are now under the MTA organization, for the most part, retained their original asset data…and the MTA had approximately 80 repositories for asset information.”

Lund explained that there has been a push within the past five years to form a stronger top-down umbrella supporting organization, the MTA HQ. He said public transit agencies are struggling for funding to either meet needs for expansion or for the reinvestment in their infrastructure maintenance and upgrade, and having a more centralized asset management system will enable the MTA to prioritize its maintenance efforts and spending.

“It’s really difficult, if not impossible, for [MTA] currently to evaluate and have a view of their infrastructure renewal needs or their expansion needs because the asset information is so disparate,” Lund added.

DXC said it has established a Center of Expertise in New York to implement best practices in asset management and performance, which includes DXC working with the MTA to hire and train engineering interns and graduates from local universities to support various aspects of the EAM solution.

“DXC and MTA are working together to improve the performance of rail assets and infrastructure, applying preventive and predictive solutions that will reduce unplanned downtime and service disruptions across the rail network,” said Carlos Lopez-Abadia, vice president and general manager, DXC Consulting.

Lopez-Abadia said he believes the EAM solution will enable the MTA to improve its on-time performance and the commuting experience for its 15 million weekly customers.

Implementing EAM best practices can enhance asset capacity and availability, resulting in cost savings over the life of the asset, DXC said. The firm also said utilizing these resources will allow for fewer disruptions in service and delays from equipment failures.

The MTA is working with DXC to implement a solution that will allow MTA employees to have real-time access to key information to keep trains operating safely and reliably. This is also expected to help deliver significant cost savings regarding maintenance activities and asset life cycles.

“With more technically sophisticated enterprise asset management solutions, the enterprise is finally seeing a clearer picture of its physical assets,” said Kevin Permenter, senior research analyst for IDC’s Enterprise Application and Digital Commerce practice. “This picture brings a complete view of the assets’ impact on the overall corporate financial position, which is also a significant factor in growth of the EAM market.”

DXC explains on its website that aging infrastructure and regulatory changes are changing the ways in which companies can effectively manage their assets.

"At the same time, business drivers and intensified regulatory systems are forcing infrastructure operators to increase efficiency and operational excellence," DXC says online. "Fortunately, the next generation of digital asset performance management solutions can profoundly affect maintenance operations and the ability of field technicians to access the information they need to fix outages and maintain equipment with minimal disruption of service to customers. Deploying these solutions strategically manages risk and enhances performance by preventing equipment failures and maximizing production capacity."

Categories: Commuter/Regional, News, OFF Track Maintenance, Rapid Transit/Light Rail, Supplier News
Tags: asset management, digital transformation, DXC, DXC Technology, MTA, New York Metropolitan Transportation Authority

Swiss ATO Pilot set for December 2019 Launch; Switzerland

Dec 18, 2018
Written by Keith Barrow

SWITZERLAND's Southeastern Railway (SOB) announced on December 17 that a panel of judges has selected a winning concept for an Automatic Train Operation (ATO) pilot, which SOB is implementing as part of the Swiss Smartrail 4.0 programme.

David Gubler

Following a competitive tender, the judges selected an ATO concept from Rail Systems Engineering as the winning proposal, with Stadler Bussnang in second place and Bombardier in third. Two of the proposals have been recommended for further evaluation.

SOB will work with the partners recommended by the judges to develop and test ATO at Grade of Automation 2 (GoA2) over ETCS Level 1 Limited Supervision on the railway's existing infrastructure.

SOB says test runs without passengers will take place in the Toggenburg region between December 2019 and December 2020, initially at night. In the second phase, the pilot train will be used in commercial service on the 16.6km Wädenswil – Einsiedeln line.

The Smartrail 4.0 programme aims to increase capacity on the Swiss rail network by 15-30% while reducing operating costs and enhancing safety. In addition to SOB, the programme is being supported by Swiss Federal Railways (SBB), BLS, Rhaetian Railway (RhB), and the Association of Public Transport (VöV).

Categories: NewsSignallingTechnology
Tags: ATOautomationBombardierdigitalisationSOBStadlerSwitzerland

Singapore LTA awards North East Line Fleet Modernisation Contract; Singapore

Dec 17, 2018
Written by David Burroughs

SINGAPORE's Land Transport Authority (LTA) and SBS Transit have awarded CRRC Nanjing Puzhen a $S 116.7m ($US 84.8m) contract to upgrade the fleet of 25 Alstom C751A trains which operate on the North East Line (NEL).

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The contract is part of a multi-year programme to upgrade the operating assets on the NEL, which opened 15 years ago.

The contract includes:

- installing a new condition monitoring system to monitor train performance more closely and facilitate better maintenance planning
- upgrading air-conditioning, ventilation and passenger information systems
- replacing interior fittings such as seats, panels and flooring, and
- detailed inspections on all the mechanical and electrical systems for the trains, with parts repaired or replaced where necessary.

The mid-life upgrade of the C751A fleet, which dates from 2000 – 2003, will be funded by the Singapore government under the New Rail Financing Framework. Works are scheduled to start in the first quarter of 2019 and are expected to be completed by the third quarter of 2024. To minimise disruption, only one train will be out of service for refurbishment at any given time, with work taking place at the NEL Sengkang Depot.

Line Upgrades

LTA and SBS Transit have also announced early closure of selected NEL stations starting January 2019 to support intensified maintenance and renewal works.

LTA says that while the NEL is one of the most reliable MRT lines, with an average of one million Mean Kilometres Between Failures (MKBF) in 2018, maintenance is needed to sustain a high level of reliability as the infrastructure ages.

From January 4 2019 to March 2 2019, NEL stations between Serangoon and Punggol will be closed early at around 23:00 on selected Fridays and Saturdays. Train services for the rest of the NEL, between Harbour Front and Serangoon, will also operate with increased headways of about nine minutes during the early closures.

From March 8 2019 to March 30 2019, NEL stations between HarbourFront and Dhoby Ghaut will be affected by early closure on Fridays and Saturdays.

The works will cover parts of the NEL power system and platform screen doors, as well as accelerate the replacement of rail crossings, signalling point machines and tracks.

"It is timely for LTA and SBST to carry out an intensified maintenance and renewal programme for the NEL trains and railway infrastructure, to ensure that commuters can continue to benefit from reliable and comfortable journeys," says LTA chief executive, Mr Ngien Hoon Ping.

"The extended engineering hours will enable us to intensify preventive maintenance activities as compared to what we can do during regular maintenance hours," says SBS

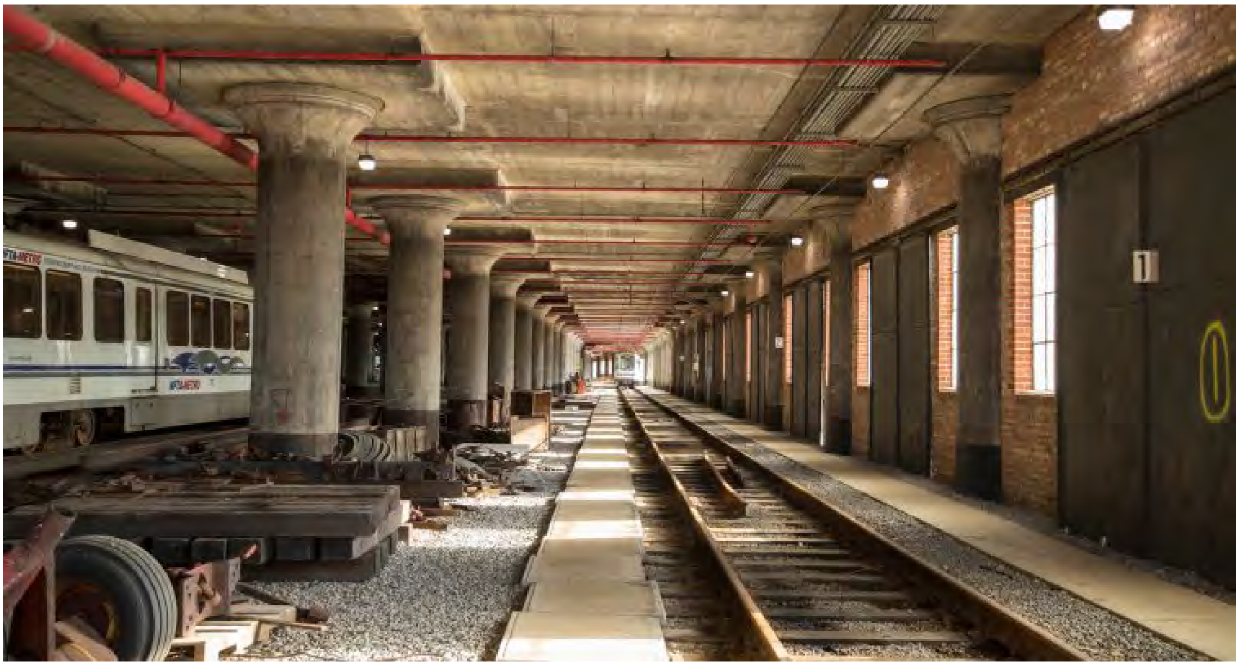
Transit CEO, Mr Gan Juay Kiat. “About one-and-a-half extra hours a night during the early closure means about 12 hours more per month. This is essential, as our train system is now more than 15 years old. Concurrently, we are embarking on renewal works on the first 25 NEL trains. These combined maintenance activities are aimed at further improving overall reliability of our NEL train services.”

Categories: AsiaMetrosNews
Tags: CRRC Nanjing PuzhenLTASBS TransitSingapore

The Niagara Frontier Transit Authority secures FTA grant to study Metro Rail expansion; eyes Terminal Redevelopment; Nigeria

- December 19, 2018
- EOI/RFP/RFQ, Passenger, Rapid Transit/Light Rail

Written by Paul Conley, Editor-in-Chief



Buffalo’s NGTA is looking to redevelop its historic DL&W Terminal
NGTA

The Niagara Frontier Transit Authority (NFTA) took two giant steps yesterday in its plans to make Buffalo a more transit-friendly city.

First, the NFTA announced that a proposal to expand light-rail service in Buffalo is getting a $778,000 boost from the federal government. NFTA said it will receive a grant of more than 3/4 of a million dollars from the Federal Transit Administration to study proposal to extend commuter service into the nearby community of Amherst, NY.

The NFTA and the Greater Buffalo Niagara Regional Transportation Council will use the cash to do planning work geared toward attracting private sector development and to maximize economic development opportunities, according to the Buffalo News. The proposed rail extension is part of a larger plant to build more walkable communities and denser development. Partners in the effort include Erie County, the City of Buffalo, Amherst, Town of Tonawanda and the University at Buffalo.

Also yesterday, the NFTA said it was seeking bids for a redevelopment of the of the historic DL&W Terminal on the Buffalo River, behind the Key Bank Center. The NFTA plans to continue to use the first floor of the terminal as a repair center and staging area for its Metro Rail cars, but hopes to convert the rest of the facility into a destination that would connect the Canalside neighborhood with the city's Cobblestone District.

The RFP says "respondents will set forth a comprehensive, compelling vision and plan to build out and manage mixed-use space using the second floor of the DL&W and possible future first-floor development/programming space that will maximize the economic vibrancy of the NFTA's Metro Rail corridor and the Canalside and Cobblestone districts," according Buffalo Business First.

News of the light-rail study and the DL&W redevelopment comes at a busy time for Buffalo rail. Just last week came news that Hohl Industrial Services Inc. and Scrufari Construction Co. won a $27.7 million design-and-build contract for an intermodal passenger transportation hub planned for downtown.

Categories: EOI/RFP/RFQ, Passenger, Rapid Transit/Light Rail
Tags: Buffalo, DL&W

Railway Gazette

INTERNATIONAL

FUTURE RAIL

On the path of change

East Japan Railway adopts a 30-year vision to transform its business model

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BELARUS

Investment drive

Electrification and new locomotives transform transit traffic prospects

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IN FOCUS

Smart metros

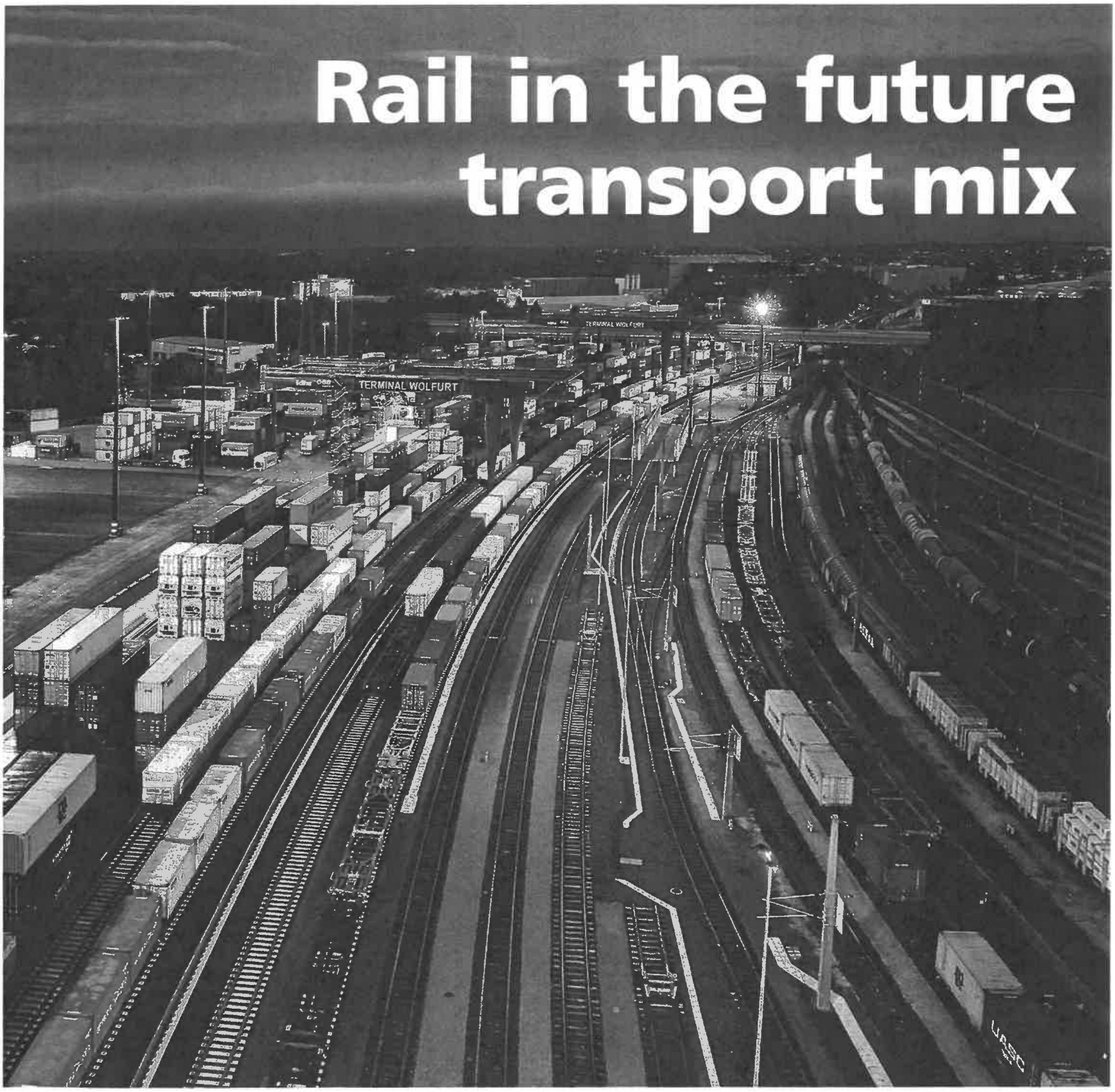
Data and automation are playing a growing role in reshaping urban transport

PAGE 46

www.railwaygazette.com

December 2018

Rail in the future transport mix



INDIA

Bhopal and Indore metros approved

The state government of Madhya Pradesh and the Indian government have agreed to build metro networks in Bhopal and Indore.

Approved by the national cabinet in October, the two schemes are to be taken forward by the Madhya Pradesh Metro Rail Co special purpose vehicle. MPMRC has already awarded contracts totalling Rs47bn to road construction company Dilip Buildcon for work on both projects, which are expected to be completed by 2023.

Bhopal is initially looking to develop two routes as the first stage of a planned six-line network. The 15 km Line 2 with 16 stations would run from Karond Circle in the north of the city to AIIMS in the southeast, while the 12·9 km Line 5 would link Bhadbhada Square in the west to Ratnagiri Tiraha in the east, serving 14 stations.

Estimated cost of the two lines is put at Rs70bn. The national and state governments are expected to provide much of the financing through matching equity stakes, with further funding coming through a loan from the European Investment Bank.

Indore is planning to start with a 31·6 km ring line, which could later be augmented by three north-south corridors. The core section of Line 3 would run from the airport in the west to Bengali Square in the east via the city centre. It would then turn north and loop around the northern suburbs to Ghandi Nagar. The line would serve 30 stations.

The cost is estimated at Rs75bn with the state and national governments again taking equal equity stakes. Additional financing for the Indore Metro will come through loans from the Asian Development Bank and New Development Bank. ■

CHINA

Changchun adds light rail line

The third line of Changchun's light rail network opened on October 30. Line 8 runs north from the northern terminus of metro Line 1 at North Ring Road to Guangtonglu.

CRRC Changchun has supplied a fleet of six-section Type C light rail vehicles to operate the elevated 13·3 km route with 12 stops; these are stabled at a depot at Taiping near the northern end of the line. They have capacity for 622 passengers, including 124 on seats which are heated to provide greater comfort in the city's cold winters. The LRVs draw power at 750 V DC and have a maximum operating speed of 70 km/h.

Construction started in April 2014 and was undertaken by China Railway Electrification Bureau.

The second phase would extend the route by 27·6 km from Guangtonglu to Mishazizhen, adding nine stops. ■

INDIA

Delhi expands

The next phase of Delhi metro Line 7 was inaugurated on October 31. The elevated 17·9 km section between Shiv Vihar and Trilokpuri Sanjay Lake has 15 stations, including three interchanges, and a depot at Vinod Nagar.

The new section is not yet connected to the rest of Line 7, which opened earlier this year in two phases between Majlis Park and Lajpat Nagar.

A two-station southern extension of Line 6 in Faridabad was opened on November 19. ■

CHINA

Tianjin metro Line 5 opens

Tianjin metro Line 5 began trial operations on October 22. The 35 km underground route runs from Danhebeidao in the north to Zhongyiyifuyuan in the south, serving 26 stations including eight interchanges. End-to-end journey time is 57 min. Construction started in 2012 and cost 18bn yuan.

Line 5 uses a fleet of six-car Type B trainsets, but all stations can take seven-car sets. At-grade single-station extensions are planned to be built at both ends of Line 5. ■

USA

Crenshaw/LAX LRVs on test

The first light rail vehicles for the Crenshaw/LAX Line in Los Angeles have been towed to the depot from the Green Line depot for testing.

The 13·7 km north-south line expected to open in late 2019. It w be operated using P3010 LRVs fro Kinkisharyo International. A total 175 of these are being supplied for t Crenshaw/LAX Line, the Gold Li Foothill Extension, Expo Line Phase and Blue Line. ■

USA

Two more streetcar lines

Two US cities gained tram services in early November.

The first phase of The Hop tram network in **Milwaukee** was inaugurated on November 2. Travel on the 3·4 km route linking Burns Commons and Clybourne Street is free for a year as part of a sponsorship deal with Potawatomi Hotel & Casino.

Kiewit Infrastructure acted as general contractor for the construction works and Brookville Equipment Corp has supplied five three-section Liberty Modern Streetcars. Services are operated by Transdev Services.

A planned second phase would link the Phase 1 route at Milwaukee Street with Downtown Transit Center on a 1·2 km branch.

The **El Paso** Streetcar opened to passengers a week later. The 7·7 km route is arranged in a single-track figure of eight serving 27 stops. The Uptown Loop service runs around both loops in one direction, whereas the Downtown Loop service only serves the southern loop.

Construction cost $97m and was managed by the Camino Real Regional Mobility Authority, which transferred responsibility for operations and maintenance to Sun Metro in early 2018.

Services are operated with a fleet of six PCC trams restored by Brookville Equipment Corp under an $18·8m contract awarded in 2015. They were manufactured by the St Louis Car Co in 1937 for the San Diego Electric Railway, which sold them to El Paso following the closure of San Diego's network in 1949.

They were withdrawn from service when El Paso's original cross-border tramway closed in 1974. ■

The El Paso Streetcar uses six PCC trams restored by Brookville.

NEWS IN BRIEF

Powered testing has started on the tram route in **Newcastle**, NSW.

The UK Department for Transport is to provide £350m of short-term repayable financing to the Mayor of **London** for the year 2018/19 to cover additional work required for the delayed Crossrail project.

Škoda Transtech and **Schöneicher-Rüdersdorfer** Strassenbahn have finalised a deal to transfer two pre-series ForCity Smart Artic trams from Helsinki.

Komsomolsk-na-Amure Mayor Andrei Klimov has ordered the closure of the municipal tram operator. Services on the 11 km three-route network were suspended in September.

An expanded metro station opened at Harrison, **New Jersey**, on October 30, serving the **Newark** branch of the PATH metro network which links **Lower Manhattan** with destinations across the Hudson River. The four-stage redevelopment programme for the station has cost US$256m.

The FLOW consortium of FS Italiane, Alstom and Ansaldo STS signed the operation and maintenance contract for four **Riyadh** metro lines on November 11 (RG 10.18 p14).

Read more urban news at www.metro-report.com

PHILIPPINES

Manila metro upgrade financing

The government has signed a loan agreement with Japan International Cooperation Agency for the Manila metro Line 3 rehabilitation project.

The 40-year, ¥38·1bn loan will fund the overhaul of infrastructure and rolling stock with the aim of returning Line 3 to its design capacity, as well as improving safety.

Infrastructure work will include replacement of track, power supplies and overhead catenary. Diagnostic technology and 'high-precision repair technology' are to be installed. Signalling is also to be upgraded. Stations will have their CCTV, public address systems, lifts and escalators renewed.

The project also covers the overhaul of the fleet of 72 light rail vehicles, as well as road-rail vehicles and depot equipment.

Infrastructure work is due to be carried out in 26 months. Completion of the rolling stock fleet is scheduled for 43 months.

The Department of Transportation is to let an operations contract for Line 3 following an unsolicited proposal from Metro Pacific Investments Corp. ■

LATVIA

Končar trams for Liepaja

Liepaja tram operator Liepājas Tramvajs has selected Končar to supply six meter-gauge trams. Končar's €8·8m bid was lower than that of Modertrans. Railvec UAB had also bid with an offer of trams made by Belkommunmash, but was disqualified.

The first tram is due to be delivered in a little over a year after contract signature, with all six due within 36 months. This marks Končar's first contract to supply trams outside its home city of Zagreb. ■

The new tramcar for Liepāja will be based on the Končar vehicles running in Zagreb.

INDONESIA

Jakarta metro loan agreed

The Indonesian government has signed an agreement for a 40-year, ¥70bn loan from Japan International Cooperation Agency to fund the second phase of the Jakarta metro.

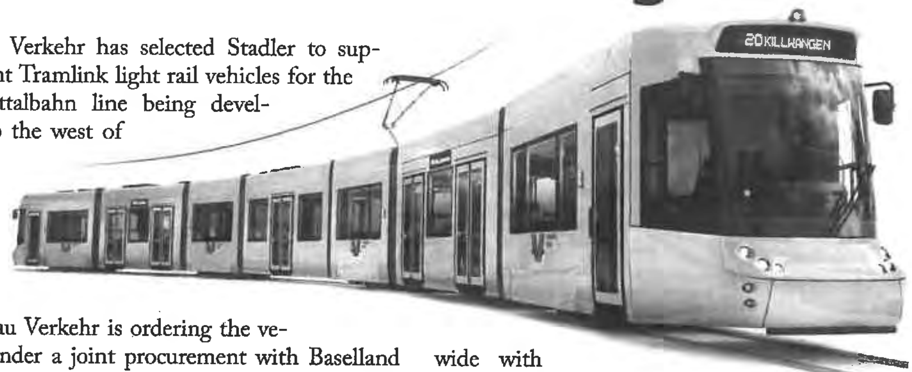
The agreement specifies Japanese rolling stock and signalling suppliers. Letters of invitation for consulting services are due to be issued in January, with tenders for the first civil works package to be called the following month. Completion of the project is scheduled for June 2025.

The second phase of the metro would run north from the terminus of the first phase, due to open next year, at Hotel Indonesia traffic circle, to Kampung Bandan, serving a further eight stations.

SWITZERLAND

Limmattalbahn rolling stock

Aargau Verkehr has selected Stadler to supply eight Tramlink light rail vehicles for the Limmattalbahn line being developed to the west of Zürich.



Aargau Verkehr is ordering the vehicles under a joint procurement with Baselland Transport, which is to receive 10 for the Waldenburgerbahn (p8). Aargau Verkehr says that the joint procurement will result in savings of SFr4·2m, for its order worth SFr43m. The contract is expected to be signed in late 2019.

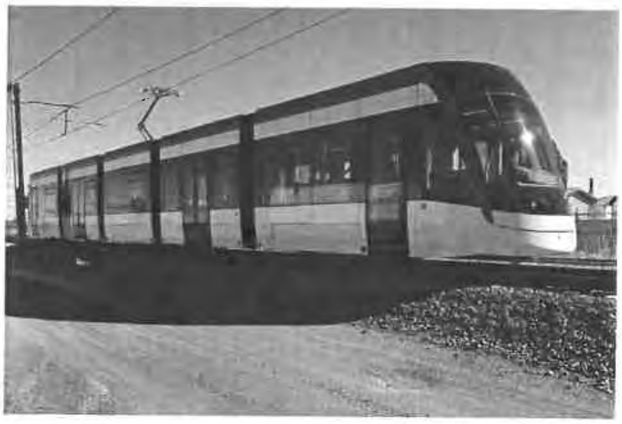
Stadler will supply the LRVs from its Valencia factory ahead of their entry into service in December 2022. The 100% low-floor bidirectional seven-section LRVs will be 44·3 m long and 2 400 mm wide with capacity for 260 passengers including 88 seated; there will also be 16 tip-up seats.

The first phase of the Limmattalbahn is due to open between Altstetten in Zürich and Geissweid in Schlieren to the west of the city at the end of 2019. Once complete in 2022, the entire 13·4 km route with 27 stops would reach Killwangen-Spreitenbach.

CANADA

Eglinton Crosstown LRV test

Bombardier Transportation is testing the first Flexity light rail vehicle for the Eglinton Crosstown line in Toronto at its Kingston facility.



Greater Toronto & Hamilton Area transport authority Metrolinx ordered 182 LRVs from Bombardier in 2010 for routes including Eglinton Crosstown. Metrolinx later launched legal proceedings against the supplier over what it claimed were a series of delays to production. A court subsequently ruled that Metrolinx could not immediately cancel the contract without compensating the manufacturer.

In 2017 Metrolinx selected Alstom as an alternative supplier, awarding it a contract for 61 Citadis Spirit LRVs, including 44 for Eglinton Crosstown. Should Bombardier deliver its LRVs in time for the opening of the route in 2021, the 44 Alstom LRVs would be reassigned to the Hurontario LRT project.

AUSTRALIA

Gold Coast Stage 3A funding

The federal government is to contribute A$112m towards the next phase of the Gold Coast light rail project in South East Queensland.

Provisionally costed at A$670m, the 6·4 km Stage 3A extension from Broadbeach South to Burleigh Heads would add eight stops. Journey time is expected to be around 16 min. The package would include improved pedestrian and cycling facilities along the route and a remodelling of the bus interchange at Burleigh Heads. The current target is to open the extension for revenue service by 2023.

The federal funding has been allocated as part of a A$7·6bn package of transport infrastructure investment planned by the national government. Queensland has yet to finalise its contribution for Stage 3A; the state government is currently working with the City of Gold Coast to prepare a detailed business case, which is expected to be ready by the end of this year.

USA

Minneapolis civils contract

The Twin Cities Metropolitan Council has awarded the civil works contract for the Southwest LRT light rail line to a joint venture of Lunda and C.S. McCrossan, which bid $799·5m.

The 23·3 km route between Minneapolis and Eden Prairie serves 16 stops. It will parallel existing freight railway tracks for 12·6 km and include two cut-and-cover tunnels.

Preliminary work is due to start before the end of the year. Main works are due to begin next year and run to 2022, ahead of opening in 2023. Work will include the construction of six pedestrian tunnels and 29 bridges; a further seven existing bridges are to be modified.

Award of the contract follows approval by the Federal Transit Administration for the start of construction. Met Council expects to submit an application to the FTA for a Full Funding Grant Agreement, which would provide $929m to cover nearly half of the total project cost.

INTELLIGENCE Market

AUSTRALIA

High Capacity Metro Trains

Testing has started of the High Capacity Metro Trains that Evolution Rail is supplying to operate Melbourne's suburban network.

The Evolution Rail consortium of Plenary, CRRC Changchun Railway Vehicles and Downer Group has a PPP contract to supply 65 electric multiple-units for use on the 1 600 mm gauge network from mid-2019. It will maintain them for 30 years at depots to be built in Pakenham East and Calder Park.

The six-car are based on CRRC's Type A design and are being assembled at Downer's Newport facility in Melbourne. They will have capacity for 1 380 passengers, compared with 900 on the current rolling stock used by operator Metro Trains Melbourne.

INFRASTRUCTURE

CANADA: The City of Québec and transport authority RTC have awarded Systra Canada a seven-year C$12·5m contract to undertake engineering design for a proposed 23 km tram line. Norton Rose Fulbright Canada is to provide legal services under a separate five-year contract worth C$375 000.

MALAYSIA: A joint venture of Malaysian Resources Corp and George Kent has won an 11·9bn ringgit construction contract for the LRT3 light metro in Kuala Lumpur.

PERU: A consortium of Metrotenerife (60%), Trazas Ingeniería (35%) and Green Life SAC (5%) has been awarded a €2m contract to help develop proposals to convert the 41 km Lima – Chosica freight line for mixed traffic operation

ROLLING STOCK

AZERBAIJAN: ŽOS Zvolen has completed work on the first two of five ČKD-built CME3 Co-Co diesel-electric locos which are being refurbished for ADY with the complete renewal of all equipment except bodyshells to extend their service life by 15 years.

CANADA: Montréal metro operator STM has ordered a further 17 nine-car trainsets from a consortium of Bombardier Transportation (€188m) and Alstom (€112m).

EUROPE: Leasing company Akiem has placed two firm orders for Bombardier to supply a total of 33 Traxx MS2, AC3 and DC3 locomotives in 2019-21.

EP Cargo has ordered a further three Siemens Vectron MS locomotives equipped for use in the Czech Republic, Germany, Austria, Poland, Hungary, Romania and Slovakia, with an option for seven more. They are to be delivered in spring 2019 and initially used in Poland.

FRANCE: On behalf of the Hauts-

'Rail needs no lectures on innovation'

Urban rail faces its own challenges, which are similar yet different from those being addressed by long-distance operators, according to the rail team at the International Union of Public Transport.

How should the rail sector respond to rapid technological change in other transport sectors?

Rail's strengths are energy efficiency, space efficiency, travel time reliability and predictability. Improvements are needed in the areas of cost efficiency and availability through better maintenance and asset management.

The rail industry needs no lectures on innovation. Urban rail is at the forefront of innovation; driverless, fully automated metro lines have been a reality for 30 years now, and connected mobility is the norm for metros that run on CBTC. But there is scope to learn from the technological step change, including digitalisation, AI and more.

Can rail retain its status as the most environmentally-friendly transport mode in a decarbonising world?

With the electrification of road transport, rail's advantage may be reduced but it will not disappear. Don't forget that environmentally-sound performance is not only about fuel or energy sources. While the electrification of other modes is a welcome development, it is important to look at the overall picture. That includes capacity; rail's energy efficiency per passenger remains hard to beat.

The life-cycle of vehicles is also important. We should ask what will be the lifespan of an electric car and its batteries. How does that compare to the life of rail vehicles?

Congestion and space consumption are key advantages for rail, even if road vehicles become electric and/or autonomous. We must not forget that a 'clean traffic jam is still a traffic jam'. We need to take people out of cars and encourage them to use public transport.

What are the key messages that the rail sector should be putting forward to policymakers in the next decade?

Without wanting to diminish the relevance of breakthrough developments such as autonomous vehicles and the diversification of mobility players facilitated by the rise of digital platforms, decision-makers must not lose sight of the fact that these do not alter the main tenets of urban mobility. There can be no efficient Mobility as a Service model without mass transit.

Scenarios exploring future urban mobility with shared and autonomous vehicles developed by the International Transport Forum show that the most effective combinations of modes — with respect to the number of cars removed from the road or kilometres driven — always include high-capacity public transport at their core. Public transport will continue to outperform all other modes in efficiency when moving the greatest number of people and rail remains the most efficient mode for busy corridors.

If you had to select one technological innovation for the rail industry to pursue in the next decade, what would it be?

It would have to be digitalisation. Much of the technology is already here, but the big challenges are likely to be around breaking the data silos and connecting the dots to maximise the impact of digital tools. Asset maintenance must become much more efficient, and digitalisation will help with that as well. Developing policies to share data is going to be essential, as will open architecture and standard interfaces.

1400 km

OF NEW METRO LINES ARE PROJECTED BY UITP TO OPEN EACH YEAR OVER THE NEXT FIVE YEARS

Tram-trains can help to integrate cities with their hinterland, breaking down barriers between national and urban networks. The first phase of the Letbane tram-train in the Danish city of Aarhus was inaugurated in August.

Do you believe that it will become easier or more difficult to realise rail infrastructure programmes over the next 10 to 20 years?

With increased pressure to remove combustion-engined vehicles from the streets, we believe policymakers will turn increasingly to rail, and not just prioritise electric road vehicles. Look at Germany for instance: whenever the courts ban diesel cars from a specific region, we see politicians pushing for rail investment. Aachen, Stuttgart and Frankfurt have all seen campaigns like this.

Indeed, the biggest fear in the rail and metro community is that there will not be sufficient expertise to plan, design and execute all the projects that are needed. UITP's current projection for the opening of new metros over the next five years is around 1 400 km per year, surpassing any previous record.

Do you feel that rail suppliers and operators can help other transport modes to embrace trends such as electric mobility and automation?

Many urban rail operators also provide buses or other 'last mile' services, so they are well placed to transfer their expertise of automation and electrification. On the supplier side, we see a clear convergence. For example, we have Alstom developing the Aptis electric bus, CAF acquiring Solaris, and Bombardier and Siemens working on e-power packs for buses.

Will the rail operator of the future be by definition a multimodal mobility player?

It is unquestionable that the future of mobility will be multimodal, but the changing landscape brought by MaaS opens up several possible scenarios. Operators can become the key mobility integrator or merely act as a rail service provider. It really depends on the ecosystem at the local level. In some places, it will be appropriate for the operator to be the mobility integrator; for others it may be a national or local authority. But this role could also be taken by new players, including tech giants like Google or Facebook.

In general, UITP believes that the added value of integration should be anchored locally. Our analysis shows that MaaS models built on a public transport integrator can be expected to achieve the highest increase in sustainable mobility, to be more socially inclusive and to be best aligned with public policy goals. However, there is a perception in some quarters that building around a traditional operating company could reduce the scope for innovation, and customer attractiveness with it. ■

IN FOCUS Great Britain

Photo: Tony Miles

A Stadler Class 399 tram-train stands alongside one of the original fleet of Sheffield Supertram vehicles at Cathedral stop on October 25.

Sheffield brings tram-train model to the UK

The UK's first tram-train route opened for service on October 25, linking Sheffield with Rotherham as part of a much-delayed pilot programme. Nick Kingsley and Tony Miles report from South Yorkshire.

Passengers aboard the 09.35 departure from Rotherham Parkgate on October 25 made history as they rode the first tram-train in revenue service in the UK. Opening of the Sheffield – Rotherham tram-train route marks the culmination of a pilot programme more than a decade in the making which aims to evaluate the potential for tram-train operation in Britain. The Department for Transport will now fund the service for an initial two-year period to gauge uptake and evaluate operating experience.

The 29 route-km Sheffield Supertram light rail network has been linked to the national rail network via a new 160 m chord at Tinsley, near the Meadowhall tram terminus. From Tinsley, tram-trains use an upgraded and electrified section of former freight-only line to reach the existing station at Rotherham Central, continuing on passenger tracks to a new stop at Rotherham Parkgate.

'Today marks the first extension of Supertram to open since 1994, and we are pleased to be able to take the network beyond Sheffield to wider South Yorkshire and tap into some important commuter flows', said Tim Bilby, Managing Director of operator Stagecoach Supertram.

The government-funded tram-train pilot project has been developed by a partnership of local transport authority SYPTE, infrastructure manager Network Rail, Stagecoach Supertram and franchised train operator Arriva Rail Northern.

The scheme was announced in September 2009 and approved by ministers in May 2012 with an expected infrastructure cost of £18·7m and opening envisaged for 2015. However, by July 2017 the cost had increased to £75·1m.

Reflecting on lessons learned, Network Rail's London North East Route Managing Director Rob McIntosh suggested that 'at times people forgot that

Invited guests ride the tram-train to the opening ceremony at Rotherham Parkgate.

Photo: Tony Miles

Photo: Tony Miles

Above: Tram-trains use dedicated platforms at Rotherham Central adjacent to those used by main line trains.

Left: A tram-train leaves Parkgate stop to join the main line towards Rotherham Central and Sheffield.

this is a technology trial planned to last two years, and it became a more political and commercial programme. When we are doing something as innovative as this, there are always going to be problems.'

Stadler cars

Supertram has acquired a fleet of seven Stadler Citylink Class 399 tram-train vehicles which have been operating on the tram network since September 2017 alongside its Siemens-Düwag trams which date from the opening in 1994. The Citylink cars meet higher crashworthiness standards, and are fitted with main line standard lighting, the TPWS train protection system and GSM-R radios.

> “
>
> ROB MCINTOSH LONDON NORTH EAST ROUTE MANAGING DIRECTOR, NETWORK RAIL
>
> 'When we are doing something as innovative as this, there are always going to be problems'

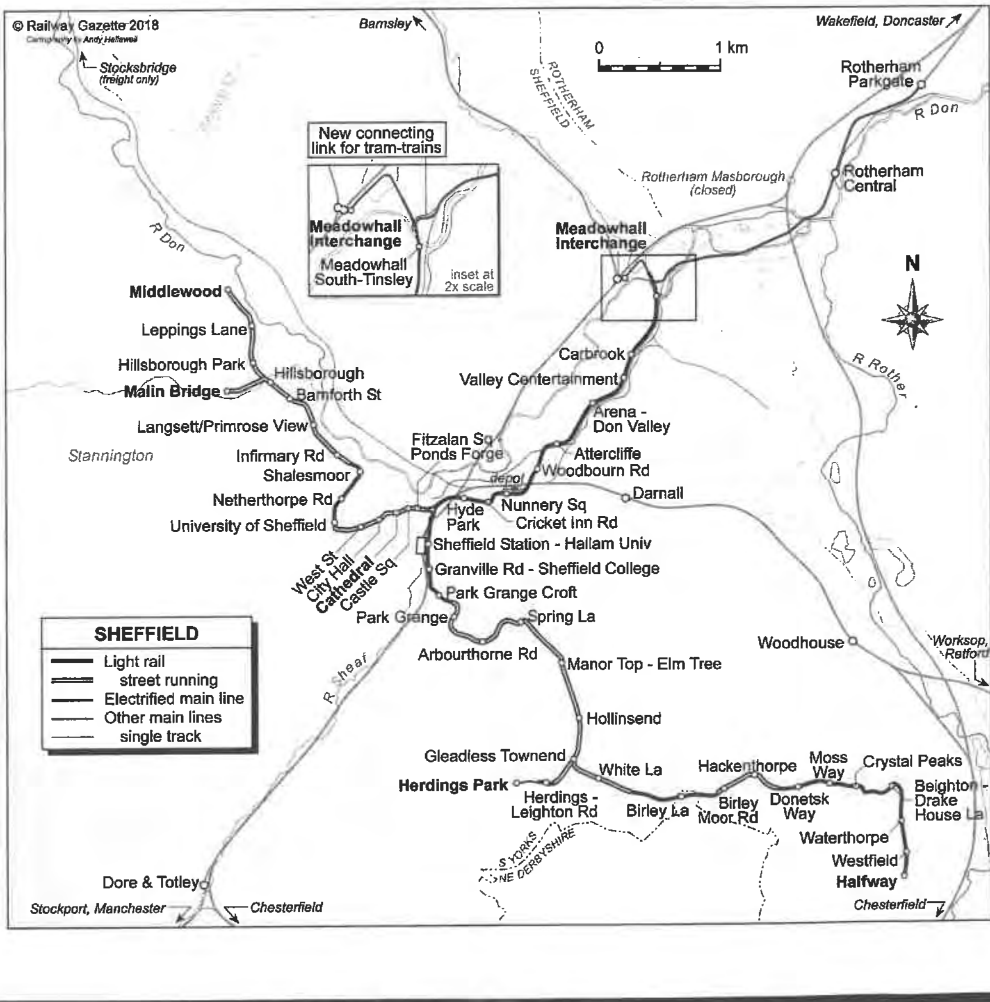
There are initially three tram-train services an hour from Sheffield Cathedral tram stop to Rotherham Parkgate. 'We are very optimistic about the future of trams in Sheffield', said SYPTE Executive Director Steve Edwards 'We have two years of funding from the Department for Transport for the Rotherham tram-train trial but we fully expect it to continue until at least 2024 which is the end of the Stagecoach operating concession.'

The extension over the national rail network has been electrified using 750 V DC overhead to match the existing Supertram network, but the Class 399 vehicles could also operate on 25 kV 50 Hz electrification should this be installed on the main line section of the route in the future.

McIntosh suggested that future-proofing the main line section for possible electrification at 25 kV 50 Hz had made the work much more complex. 'We had to design bespoke overhead line equipment and adjust structures for a supply voltage we are not actually using. That added significant cost', he said.

McIntosh was cautious about Network Rail becoming involved in future tram-train projects. 'We will share what we have learned with the Department for Transport and the rest of the industry but we don't necessarily need to be the developer.'

While the Sheffield scheme marks the first application of tram-trains in Britain, a section of the Tyne & Wear metro network has light rail vehicles sharing main line tracks around Sunderland. ■



IN FOCUS Signalling

Automation drives an urban revolution

Digitalisation, automatic train control and passenger information systems are starting to converge as the backbone to enable demand-responsive urban rail operations Chris Jackson reports from the Smart Metro conference in Paris.

More than 200 delegates gathered in Paris for the Smart Metro 2018 conference and exhibition.

In an era of digitalisation, the convergence of train control technology with powerful data analysis tools is opening up new ways to operate and manage urban rail networks. This premise provided a strong focus for the Smart Metro conference which took place in Paris on October 30-31. As well as a core stream looking at the evolution of communications-based train control, the event included sessions on assets and digitalisation, operational excellence and smart mobility, along with presentations on autonomous vehicles, robotic maintenance and integrated multi-modal smart ticketing.

While some advocates see self-driving cars as potentially displacing traditional public transport, Easymile's Clément Delbouys argued in his keynote presentation that there would still be a role for high capacity rail systems as the most efficient way to move large volumes of people in urban areas. Pointing out that 18 lanes of road traffic in each direction would be needed to match the capacity of a single metro line, he argued that autonomous vehicles were more likely to find a role offering 'last mile' feeder connectivity to and from stations in less-dense suburban areas.

Noting that the company's technology was now in use in 24 cities, the Head of CBTC at Ansaldo STS, Alexandre Betis said the operational experience was being harnessed to inform the development of smarter functionality for future applications. Moving from manually driven trains to automatic could increase line capacity by two or three trains an hour, simply by tightening up on reaction times, he suggested. Similarly, faster release of the doors at stations could save 0·5 sec per stop.

Nevertheless, each new application brings new challenges, Betis pointed out. The forthcoming resignalling of the Glasgow Subway for GoA4 unattended train operation will draw on experience in København, but must include the ability for one train to rescue another in the small-profile single-bore tunnels. The new Stadler trains will have automatic couplers so that one train can couple up and push or pull a failed set to the next station under remote control.

Looking ahead, Betis suggested that a priority would be to further reduce the amount of lineside equipment that needs to be installed and maintained, including the balises used to ensure accurate train location. As part of its Genius project, Ansaldo STS is exploring some of the concepts being developed for autonomous vehicles, and he cited the possibility of using cameras for train positioning, perhaps in conjunction with barcode marker boards.

UTO to UTO conversion

With the conference taking place in Paris, many of the presentations focused on the huge investment in new and upgraded metro lines being undertaken as part of the Grand Paris Express programme, as well as the EOLE project to expand RER Line E into a cross-city corridor.

RATP's Head of Systems Engineering Claude Andlauer reported that investment in the capital's metro network in 2012-20 was running at €1·6bn a year, with four lines being extended and three new automated routes under construction. Together, these would bring a 37% increase in capacity.

At present lines 1 and 14 are driverless, while the conversion of Line 4 to GoA4 is expected to be completed by 2020. Four lines are using attended ATO, and two more are currently being

As part of its Genius project, Ansaldo STS is investigating the use of video cameras for train location.

upgraded to GoA2. Citing the challenges of retrofitting automation onto existing trains, Andlauer said the next projects would be phased with rolling stock renewals; new MF19 trainsets are due to be rolled out on nine lines during 2023-33.

Meanwhile, Line 14 is being expanded at both ends to become the north-south backbone of the Grand Paris network. By 2024, it will run for 28 km from Orly to Pleyel, three times the current length. This is expected to increase ridership from around 500 000 passengers/day to more than 1 million, requiring a significant uplift in capacity. The present fleet of six-car trains will be replaced by eight-car sets operating at a minimum headway of just 85 sec.

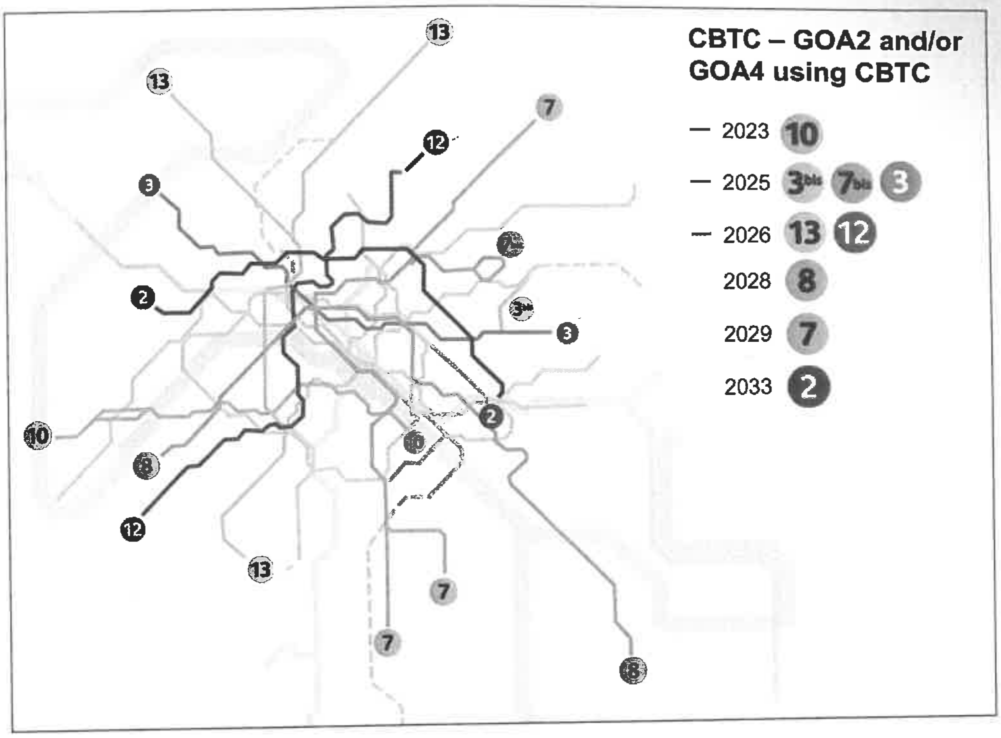
Whereas the short extension from St Lazare to St Ouen now nearing completion could be accommodated using the existing Météor train control system, the next phases include the replacement of the 20-year old technology by Trainguard MT, in what Siemens' Paul Edouard Basse described as 'the first GoA4 to GoA4 migration' of a high-capacity driverless metro line.

Unlike the conversion of lines 1 and 4 from manual driving to UTO, which could be phased over several stages, Basse said that the Line 14 conversion would require a 'big-bang strategy', culminating in single switchover in order to maintain continuity of operations. With little time available at night, the intention is to do 'a lot of factory testing before roll-out', although he accepted that an extensive programme of on-track testing would still be essential.

Météor uses a local interlocking at each station which interfaces with the platform screen doors, but Basse explained that the intention is to reconfigure Line 14 so that all systems are managed directly from the operations control centre, although there would still be some distributed wayside equipment to provide redundancy.

Siemens has also been selected to supply and maintain for 30 years the train control systems for GPE lines 15, 16 and 17, under a single contract covering a total of 125 route-km and 50 stations, worked by a fleet of 185 trainsets. Basse said this would be commissioned in 12 sections from 2025-30.

With these lines, the intention is to integrate the interlockings and power



RATP expects to upgrade the train control on nine lines in conjunction with the introduction of new MF19 trains.

management with the CBTC in order to reduce complexity. One specific requirement will be to develop CBTC-equipped maintenance trains that can move at line speed under automated control but then split to work independently on site before being rejoined for the return trip.

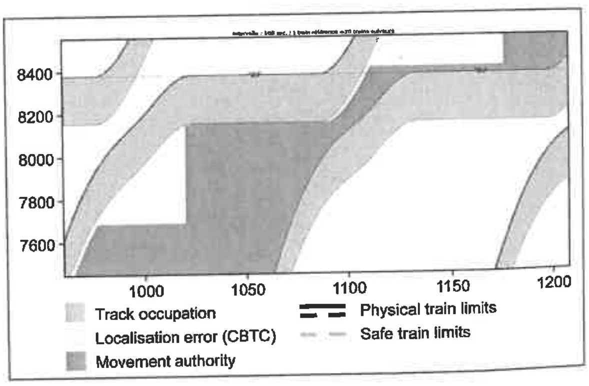
NExTEO takes shape

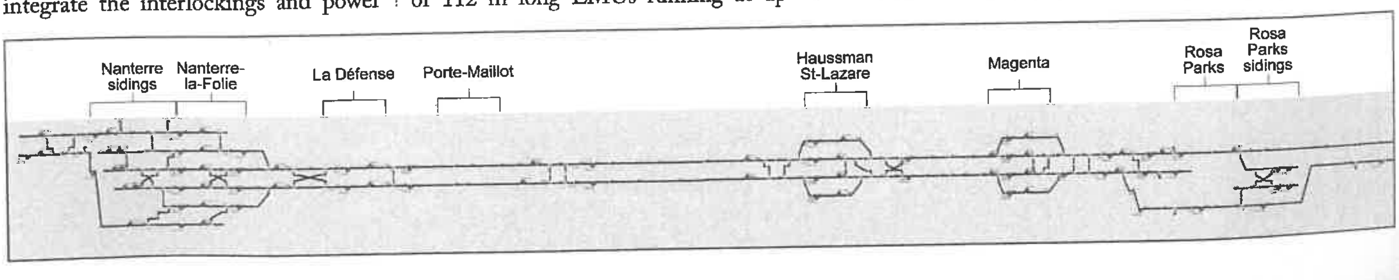
The other prominent resignalling project in Paris is NExTEO. This CBTC-based system is being developed by Siemens for use on RER Line E from 2021, but will also be rolled out on lines B and D under a joint project between SNCF and RATP.

Vice-President of SNCF Transilien Pierre Messulam explained that the national railway's suburban operations are now carrying between 3·2 and 3·4 million passengers in and out of the capital each day, and the figure is growing by around 2% per annum. Work is due to start next year on boring the 8 km tunnel between La Défense and Haussmann St-Lazare which will allow Line E to be projected westwards through Nanterre and Poissy to Mantes-la-Jolie.

The train control system must accommodate up to 34 trains/h in each direction through the core, with pairs of 112 m long EMUs running at up to 120 km/h at 108 sec headways. This would 'definitely need moving block', Messulam explained. And while SNCF is looking to migrate to unattended train operation in the longer term, he said the 'step-by-step' process would start with GoA2.

The CBTC will initially interface to the existing KVB automatic train protection system on the surface tracks to the east and an enhanced version to the west designated KVB-p. Trains will make a dynamic transition to CBTC on the approaches to Nanterre-la-Folie in the west and Rosa Parks station in the east. To facilitate a long-term migration from KVB to ETCS, the NExTEO onboard system will use a standard ERTMS-compliant EVC and Specific





Simulation and modelling are being used to optimise the performance of the NExTEO train control system on the expanded core of RER Line E.

Transmission Modules for the CBTC and KVB lineside equipment.

SNCF Réseau's Sylvain Baro explained that Transilien was looking for a very high level of performance. The requirement for NExTEO is for trains to operate within 3% of the optimum running time for a 'perfect' moving block system, based on a practical headway of 120 sec. Average delay measured across 10 successive trains should be no more than 4·5 sec.

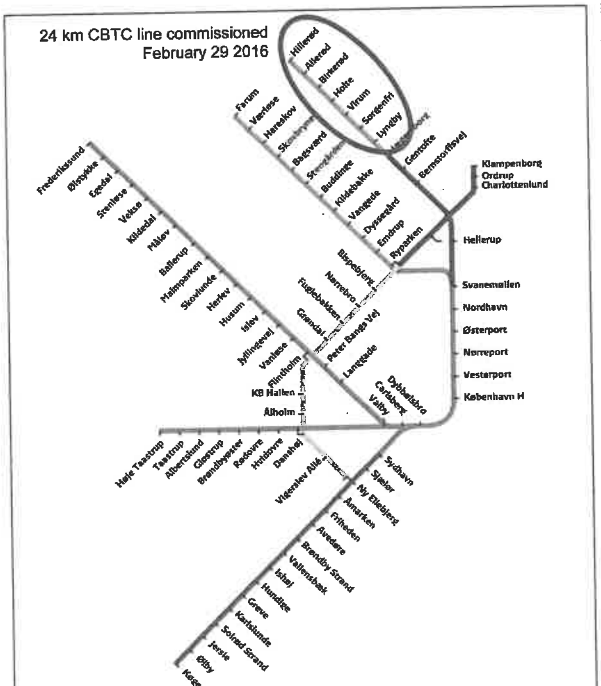
Looking ahead, Messulam reported that as part of a 'Next Steps' process, SNCF and RATP were looking at the potential for harnessing direct train-to-train communication to share real-time information, such as warning of low-adhesion areas during the leaf-fall season. He also raised the vision of using automotive 'platooning' concepts to manage the operation of five or 10 trains together, optimising headways, dwell times and delays. 'This could radically change the way we think about train regulation', he suggested, adding that automated trains might be more suited to adapting their behaviour in real time than human drivers.

S-bane initiative

Staff training and operational processes are also a key factor in the introduction of CBTC on the København S-bane network, according to DSB project manager Ann Camilla Larsen.

A pilot section of Line A between Jægersborg and Hillerød was switched over with effect from February 29 2016, since when work has been focused on preparing for the roll-out of CBTC across the rest of the network, including the fitting of onboard equipment to all 104 eight-car and 31 four-car EMUs.

Glasgow's new Stadler train sets are fitted with automatic couplers to allow remote rescue in the single tunnels.



Installation of CBTC for the RO2 area was completed at the end of October.

Larsen reported that installation work had been completed on October 27-28 for the second phase, which will see the CBTC area on Line A extended towards the city centre from Jægersborg to Svanemøllen, together with the northern part of Line C from Hellerup to Klampenborg and Line F from Hellerup to Ryparken. While completion of the CBTC project is currently scheduled for 2022, she added that a new timescale was under discussion, perhaps reflecting the rescheduling of Denmark's main line ETCS programme.

Citing experience with the pilot section, Larsen said that testing and commissioning would require a number of weekend closures, culminating with a total blockade, during which the operator would attempt to simulate a full ghost service, running 'as normal as possible'. In this, DSB had to work closely with Banedanmark and Siemens to provide the drivers and other staff. Reporting that 520 out of 580 S-bane drivers had now been trained to use the CBTC, she said one of the challenges with the pilot section had been to get the staff to recognise when the new system had gone live.

One particular requirement for the København project was the need to couple and split trains during the course of the day. This was not a standard feature in CBTC, but a regular operating practice on the S-bane, and solving it was a complex process, she said.

Thinking ahead

Siemens is looking at 'how to do signalling in the future', according to Andre Rodenbeck. As General Manager for Mass Transit in the rail automation division of Siemens Mobility, he told *Railway Gazette* at Smart Metro that he saw 'a lot of scope for greater convergence between train control and passenger information systems'.

Siemens has been developing a digital management system for station equipment including escalators, ventilation and ticket gates which could also be used to control dynamic signage to manage passenger flows. Rodenbeck suggested that this could be combined with elements of the Trainguard MT CBTC family to support demand-responsive operations.

'We are already showcasing that in München, where we are working with SWM on a proof of concept trial at one station, using video data analysis to determine platform occupancy in real time and inform the operator's train loading predictions. Our aim is to test our ideas in a live environment and "co-create" a concept; we are currently looking at a second trial at München Hbf. An operator or authority can't just tender something like that at the moment, as it is pushing the boundaries of what is possible.'

Rodenbeck reported 'a growing interest among Chinese metros in moving to GoA4 in conjunction with mid-life refurbishment'. Whereas most metro lines built over the past two decades used attended ATO, Siemens has recently won contracts to provide CBTC for driverless lines in Nanjing and Suzhou, and has established a local research centre. Citing the speed of development and China's willingness to adopt new technologies, he anticipated that 'this could feed back into our CBTC thinking in other markets'.

Asked about the potential for platooning and direct train-to-train communication, Rodenbeck emphasised that 'it is not purely about having intelligent trains'. He envisaged that the next generation of CBTC would bring more systems under a single control architecture, suggesting that 'there is scope to eliminate a lot of lineside hardware, potentially everything except the point machines. He pointed out that the Grand Paris Express projects will see turnout control and interlocking functions managed through the CBTC, but said there are also opportunities to develop these concepts on current brownfield projects such as the København S-bane and Hong Kong's East Rail resignalling.

Meanwhile, as a practical measure to enable a data-driven railway, Rodenbeck added that Siemens has decided to embed its Data Capture Unit (RG 9.18 p124) into all future metro projects, providing a gateway to allow collection of data from safety-critical systems without any risk of interference or cybersecurity breaches. ■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TSA Motors upgrade the Glasgow Subway –
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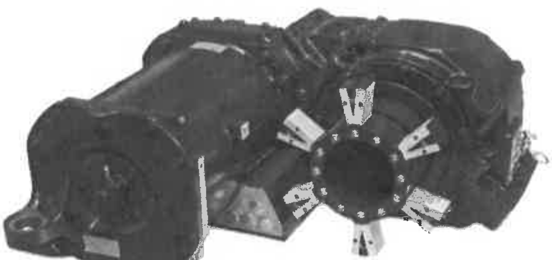

METRO NEWSLETTERS
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METRO Newsletter by Dr. F.A. Wingler
METRO 12, January 2019

Manaus Monorail Project, Brazil

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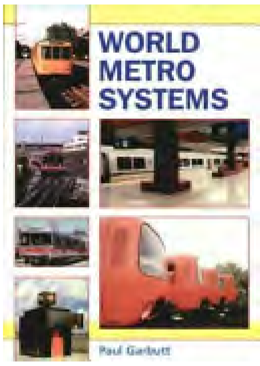

Paul Garbutt
Capital Transport Publishing, 1997 - Railroads - 136 pages
0 Reviews
An excellent general survey of Metro systems, continent by continent. Factors involved with the design of a metro are covered, together with a brief account. The chapters for each part of the world are generously illustrated and an appendix gives fact and figures such as system size, traction system and gauge. A very useful work of reference for anyone interested in urban railways.
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Bibliographic information

Title	World Metro Systems
Author	Paul Garbutt
Edition	2, illustrated

Publisher	Capital Transport Publishing, 1997
ISBN	1854141910, 9781854141910
Length	136 pages

Metro Rail Projects in India: A Study in Project Planning

M. Ramachandran
Oxford University Press, 21 Oct 2011 - Business & Economics
0 Reviews
Taking stock of the urban transport scenario in Indian cities, this is the first full-length study of the metro rail system in India. In recent times the metro rail has come up as a favoured alternative of mass transport in urban spaces faced with growing population, heightened vehicular traffic, and increased pollution. Using data, analysis, and first-hand information, this book tells the story of metro rail as proposed and undertaken across Indiafrom Kolkata in the east and Mumbai in the west to Delhi and Jaipur in the north and Chennai, Bangalore, Hyderabad, and Kochi in the south. Focusing on the complexities of project planning and contrasting the Indian experience with those of its global counterparts, this volume distils important lessons for future infrastructure projects. While the metro rail system has considerably improved inter-city connectivity, the metro story in India is an ongoing one. With a Foreword by E. Sreedharan setting the stage, this volume will appeal to anybody keen to know more about urban transport in India, as well as policymakers, management professionals, and students and researchers of economics and business studies.
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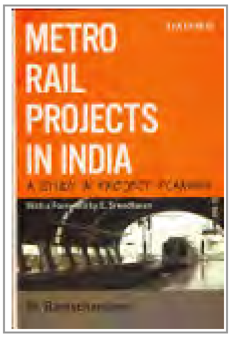


3 Nov 2011

No preview

›Common terms and phrases

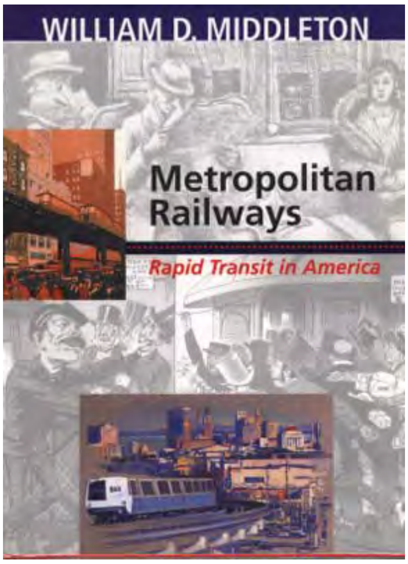
approved Bangalore Metro broad gauge buses capital cost cars cent central taxes commissioned commuters completion cost concessionaire congestion construction Corporation crore crore Government crore Total Delhi Metro DMRC economic EIRR elevated environmental equity escalation estimated fare structure feasibility financing FIRR funding given in Table GNCTD Government of India Government of Karnataka Haryana Hyderabad implementation increase infrastructure investment JBIC JICA Kolkata Metro lakh lakh passengers land loan LRTS metro projects metro rail Metro Railway metro system million Ministry of Urban MMRDA MRTS Mumbai Metro Nagar NUTP operation and maintenance Phase PHPDT pollution population project cost proposed public transport rail systems rail-based revenue ridership road rolling stock route sector senior term debt share Singapore SMRT Trains standard gauge stations subordinate debt taken Tamil Nadu taxes and duties traffic transport system trips underground Urban Development urban transport vehicles West Bengal

Bibliographic information

Title	Metro Rail Projects in India: A Study in Project Planning
Author	M. Ramachandran
Contributor	E. Sreedharan
Publisher	Oxford University Press, 2011
ISBN	0199088535, 9780199088539
Subjects	Business & Economics › Economics › General Business & Economics / Economic History Business & Economics / Economics / General Business & Economics / Industries / Transportation Business & Economics / Urban & Regional Political Science / Political Economy Social Science / Sociology / Urban Transportation / Railroads / General

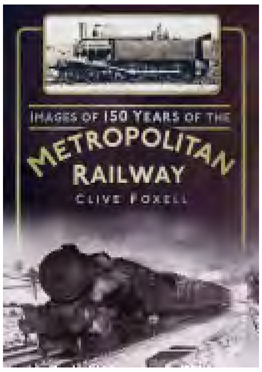
Metropolitan Railways: Rapid Transit in America

By William D. Middleton



ISBN: 978-0253341792

150 Years of the Metropolitan Railway



Clive Foxell
History Press Limited, 2012 - History - 128 pages
0 Reviews
To celebrate its 150th anniversary, this book endeavours to capture in pictures the beguiling character of the Metropolitan Railway, which started as the world's first underground railway between Paddington and Farringdon, but grew to create iconic Metro-Land, later immortalised by John Betjeman. However, this evolution was influenced by the notorious Victorian entrepreneur, Edward Watkin, which resulted in the "Met" having to share some of its routes with a mainline railway—indeed it still does so. The other major change was the reluctant absorption in 1933 into the new London Transport, which sought to make it adopt their standard practices. Although this was suspended due to the Second World War, in which bombing took a heavy toll on the vital cross-London lines, by 1961 LT was able to replace most of the Met steam services with electrification. Now these trains are themselves being replaced by new stock, marking another facet in the complex story of the idiosyncratic "Met" cherished by millions of travellers.
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About the author (2012)

Clive Foxell is a former Managing Director of BT. On retirement he became President of the Institute of Physics and Vice-President of the Institute of Electrical Engineers. He has self-published five railway history books and has written *The Metropolitan Line* for The History Press. He lives in Chesham, Bucks.

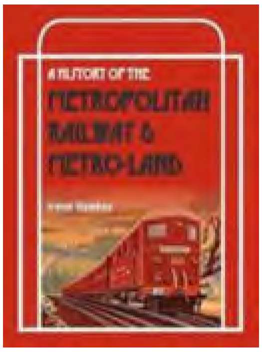
Bibliographic information

Title	150 Years of the Metropolitan Railway *History Press Series*
Author	Clive Foxell
Edition	illustrated
Publisher	History Press Limited, 2012
ISBN	0752470094, 9780752470092
Length	128 pages
Subjects	History › Europe › Great Britain › General History / Europe / Great Britain / General Transportation / Railroads / History Transportation / Railroads / Pictorial

Bibliographic information

Title	The Metropolitan Railway and 'Metro-Land'
Author	Irene Hawkes
Edition	illustrated
Publisher	Oxford Publishing Company, 2017
ISBN	0860936740, 9780860936749
Length	192 pages

The Metropolitan Railway and 'Metro-Land'



Irene Hawkes
Oxford Publishing Company, 2017 - London (England) - 192 pages
0 Reviews

Bibliographic information

Title	The Metropolitan Railway and 'Metro-Land'
Author	Irene Hawkes
Edition	illustrated
Publisher	Oxford Publishing Company, 2017
ISBN	0860936740, 9780860936749
Length	192 pages

Costa Rica Commuter DMU Order; Costa Rica

20 Dec. 2018

COSTA RICA: National railway company Incofer has named CRRC Qingdao Sifang as the winner of a contract to supply eight two-car diesel multiple-units for use on commuter services in San José.

The contract is valued at US$32·7m, and the supplier will also maintain the trains for three years. Deliveries are scheduled to begin in 16 months.

The 1067 mm gauge stainless steel DMUs will have a maximum speed of 70 km/h and will comply with EU Stage IIIA emissions regulations. Each 38 m long unit will have a capacity of 371 passengers, with areas for passengers with reduced mobility, air-conditioning and a passenger information system.

The commuter services are currently operated using a fleet of Class 240 DMUs acquired second-hand from Spanish operator FEVE.

Related news

- 27 Sep 2017 - Loan funds more Incofer rolling stock
- 03 Dec 2012 - Commuter co-operation in Costa Rica
- 01 Jul 2012 - World rolling stock market July 2012
- 13 Oct 2009 - TREM project launched in San José
- 17 Mar 2009 - World rolling stock market March 2009

USDOT grant to bolster PTC along Metra Lines; Chigago, USA

Written by Kyra Senese, managing editor

Mischa Wanek-Libman

Rep. Dan Lipinski of Illinois' third District has announced that Metra, the commuter railroad serving the Chicago metropolitan area, will receive more than $2 million from the U.S. Department of Transportation (USDOT) to bolster its implementation of Positive Train Control (PTC) technology.

PTC implementation is a federally-mandated computerized system intended to prevent train-to-train collisions, better avoid derailments and other accidents caused by excessive speeds and boost safety for rail workers.

"This funding is good news for Metra users and every commuter in the Chicago area," Lipinski said. "Representing a district with a large number of rail lines, I have always made safety a top priority on the Railroad Subcommittee. In 2008, I included language in a bill to create the Rail Safety Technology Grant program to help railroads install life-saving PTC more quickly. Last Congress, I joined with Rep. Quigley on a bill to reauthorize the grant program so that Metra could get federal help to install this critical technology."

Lipinski said in a statement that the grant is expected to support Metra's purchase of onboard PTC equipment for recently purchased locomotives.

Lipinski's office said he met with Metra and BNSF earlier this month, at which time Metra CEO Jim Derwinski said some delays observed along the BNSF line and other Metra lines were a result of the need to update the railroad's PTC equipment.

"I'm hopeful this grant money will help alleviate some of the delays and other problems with Metra trains," Lipinski said. "I will continue to push my colleagues in Congress to consider a comprehensive infrastructure bill before the end of the year that includes additional dollars to help expedite the implementation of PTC both in the region and across the country."

In September of 2018, Metra celebrated the completed installation of all hardware required for its PTC implementation. Installing all PTC components on the commuter railroad's trains and communications and signal systems was one of four achievements outlined as requirements for Metra to qualify for an alternative deadline to have PTC fully implemented by Dec. 31, 2020, officials explained in September.

Metra is expected to spend approximately $400 million to install PTC along its system and will pay between $15 million to $20 million in annual operating costs, officials said. About a tenth of the of the costs had already been covered as of September by $43 million in federal PTC grants.

The commuter railroad said it is also preparing to ramp up its interoperability efforts because Metra's PTC system must be interoperable with 13 other railroads before complete implementation is achieved.

Categories: C&S, Commuter/Regional, News, Regulatory, Safety/Training
Tags: Chicago, commuter railroad, Illinois, Metra, Positive Train Control, PTC, Rep. Dan Lipinski, U.S. Department of Transportation, USDOT

- , News, Rapid Transit/Light Rail

First Section of Sound Transit East Link Rail Installation nearly complete; Seattle, USA

- December 20, 2018
- Commuter/Regional, News, Rapid Transit/Light Rail

Written by Kyra Senese, managing editor

East Link Extension Project Map | Image courtesy of Sound Transit

Sound Transit has announced that the first section of its upcoming East Link rail installation has made another stride toward its completion with the installation of ballasted tracks that will carry light-rail vehicles across Mercer Island, Wash.

The segment is a mile and a third long, stretching from 80th Avenue Southeast to slightly east of East Mercer Way, and it will be the first segment of rail completed on the East Link project, Sound Transit says.

Crews are currently installing rail on concrete ties set ballast to form a bed for the track.

In 2019, crews are set to install rail on the Homer M. Hadley floating bridge, including the track bridges that are intended to accommodate lake motion to allow light-rail vehicles to travel safely across the floating section of I-90.

The East Link is set to extend light rail by 14 miles from downtown Seattle, Wash., to downtown Bellevue and the Overlake area of Redmond via Interstate 90, with the addition of 10 stations.

Officials said construction of the East Link extension is more than 40 percent complete, and the entire line is set for operation in 2023.

Categories: Commuter/Regional, News, Rapid Transit/Light Rail
Tags: ballasted tracks, East Link, light-rail vehicles, rail installation, Seattle, Sound Transit

Denver's Regional Transportation District submits Plan to fix PTC, Signal, Crossing Problems; Denver, USA

- December 20, 2018
- C&S, Commuter/Regional, OFF Track Maintenance, Passenger, Regulatory, Safety/Training

Written by Paul Conley, Editor-in-Chief

A Commuter Train crosses York St. at 40th Ave. in Denver.
Regional Transportation District of Denver

The Regional Transportation District has released a 35-page plan outlining the steps it will take to resolve issues with crossing gates on the line that serves the Denver International Airport.

The plan is in response to a threat by the Federal Railroad Administration to pull a waiver that allows the A Line to operate with new wireless gate technology. The FRA has complained that gates come down too early and remain down too long with the new system. That waiver already requires that flaggers man every crossing. The costs associated with the flaggers are one of the issues that led to a series of lawsuits between the RTD and the contractor that built the gate system and operates the line, Denver Transit Partners. DTP is comprised of a partnership among Fluor Enterprises, Inc. (a unit of Fluor Corp.); Denver Rail (Eagle) Holdings, Inc., a unit of John Laing plc; and Aberdeen Infrastructure Investments (No 4) USA LLC, a unit of Aberdeen Global Infrastructure Partners LP. Other team members include: Balfour Beatty Rail Inc., ACI, Ames Construction and HDR.

An integrated Positive Train Control (PTC) and Wireless Crossing Activation System (WCAS) employed on the RTDC system was manufactured by Wabtec. Xorail, a Wabtec company, integrated the Wabtec PTC and WCAS systems with signaling and grade crossing activation systems from Alstom and Siemens "to provide an integrated and safe grade crossing activation and warning system that uniquely enforces and protects the FRA mandated minimum warning time of twenty (20) seconds," according to the correction plan released by RTD.

A spokesperson for Wabtec told *Railway Track & Structures* the company does not comment on ongoing litigation.

RTD is the first electrified railroad to use the new Wabtec PTC/WCAS system.

Among the corrective actions that RTD envisions are the installation of Radio Frequency repeaters of GPS signal to improve reception and a review of the WCAS activation and prediction algorithm (which RTD believes may have "too aggressive an acceleration curve with too large a safety factor." RTD will also consider the use of other techniques and technologies, including TWC loop detection and motion-detection systems.

The A Line has 11 at-grade crossings, 10 of which it shares with the Union Pacific. In June of this year, the FRA gave RTD permission to remove flaggers from six of those crossings.

Categories: C&S, Commuter/Regional, OFF Track Maintenance, Passenger, Regulatory, Safety/Training
Tags: Denver Transit Partners, Federal Railroad Administration (FRA), Positive Train Control (PTC), RTD, Wireless Crossing Activation System (WCAS)

Manaus Monorail Contract signed; Brazil

03 Feb. 2012

BRAZIL: The Infrastructure Secretariat of Amazonas signed a contract with a consortium of Scomi Engineering, CR Almedia, Mendes Junior and Serveng, on January 20 to build a 20 km straddle monorail in the city of Manaus.

Total value of the contract is put at R$1·45bn. Scomi Engineering's share is worth R$339·9m. It includes the supply of 10 six-car SUTRA trainsets and depot equipment, as well as track switches, a maintenance vehicle, system integration and project management.

Announced in August 2011, the line will run from Largo da Matriz to Jorge Teixeira, serving nine stations; it is designed to carry up to 35 000 passengers/h per direction. Completion is scheduled for 2014.

Scomi was awarded its first Brazilian monorail project on June 2 2011 as part of the Monotrilho Intergração consortium, which is to build the 18 km elevated Line 17 with 18 stations in São Paulo.

World`first Monorail, System ALWEG/LHB, Cologne, Germany, around 1960

METRO NEWSLETTERS
on
URBAN MOBILITY

PUBLIC MULTIMODAL URBAN, SUBURBAN AND INTERURBAN PASSENGER TRANSIT SYSTEMS WITH METRO-BUS, LIGHT-RAIL, METRO-RAIL, REGIONAL RAPID TRANSIT, COMMUTER-RAIL, ROPE-WAY/TRAIN, WATER-METRO, AUTOMATED PEOPLE-MOVER

TRANSPORTATION AND ECONOMIC DEVELOPMENTS IN MODERN URBAN/MEGAPOLIS ENVIROMENT

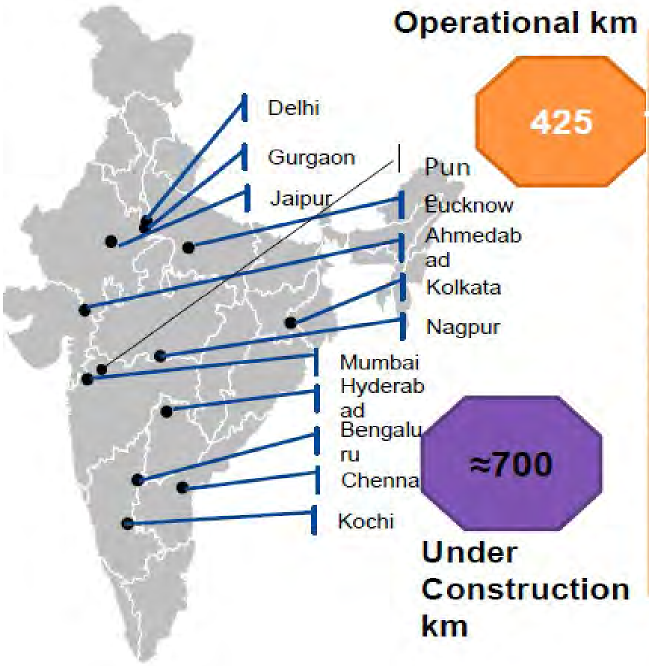
METRO Newsletter by Dr. F.A. Wingler
METRO 13, January 2019

Kabul Metro-Bus Project launched, Afghanistan

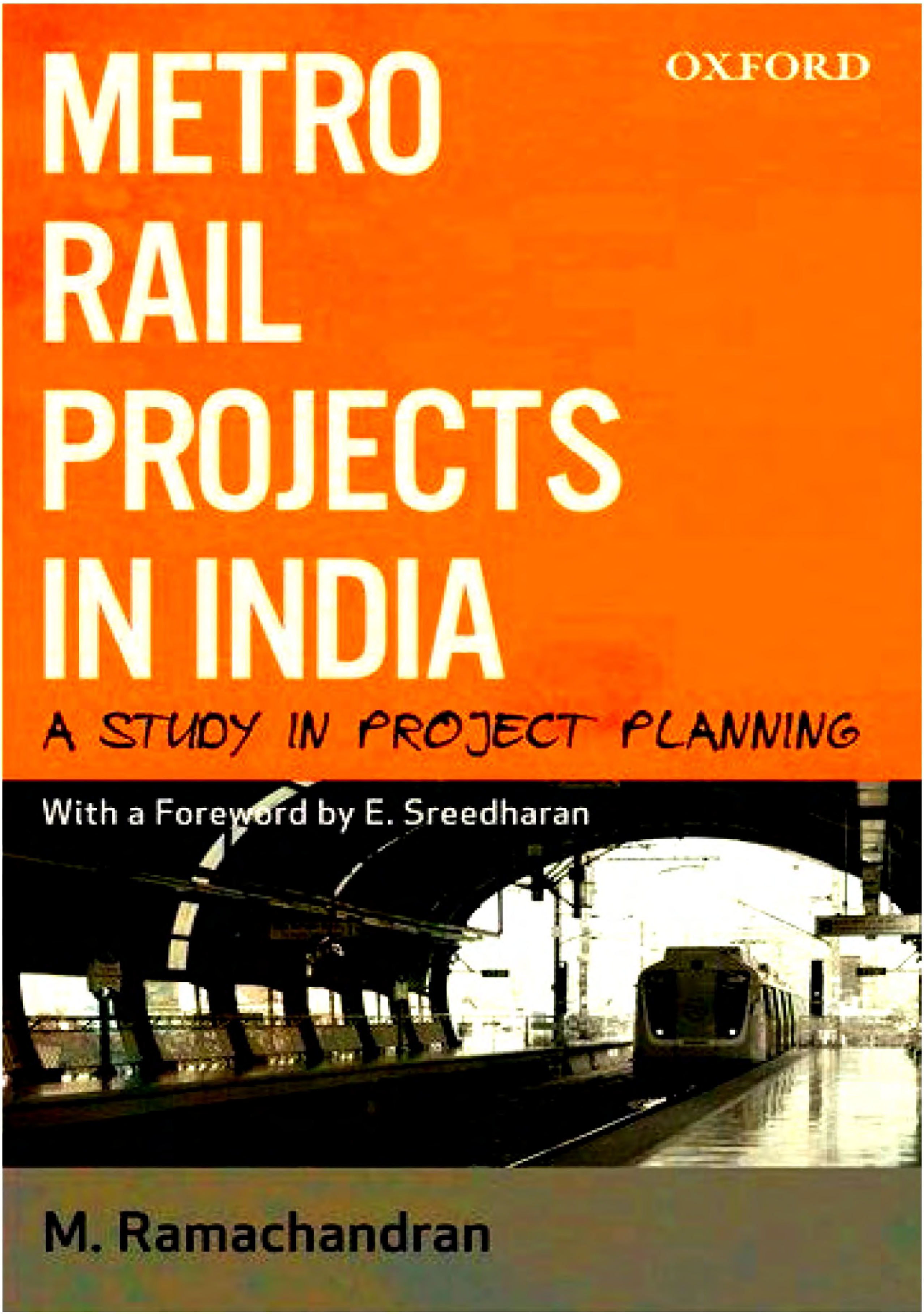
PART I: ACTIVITIES FOR URBAN MOBILITY SOLUTIONS IN INDIA

Metro Rail Projects in Indian Cities; India

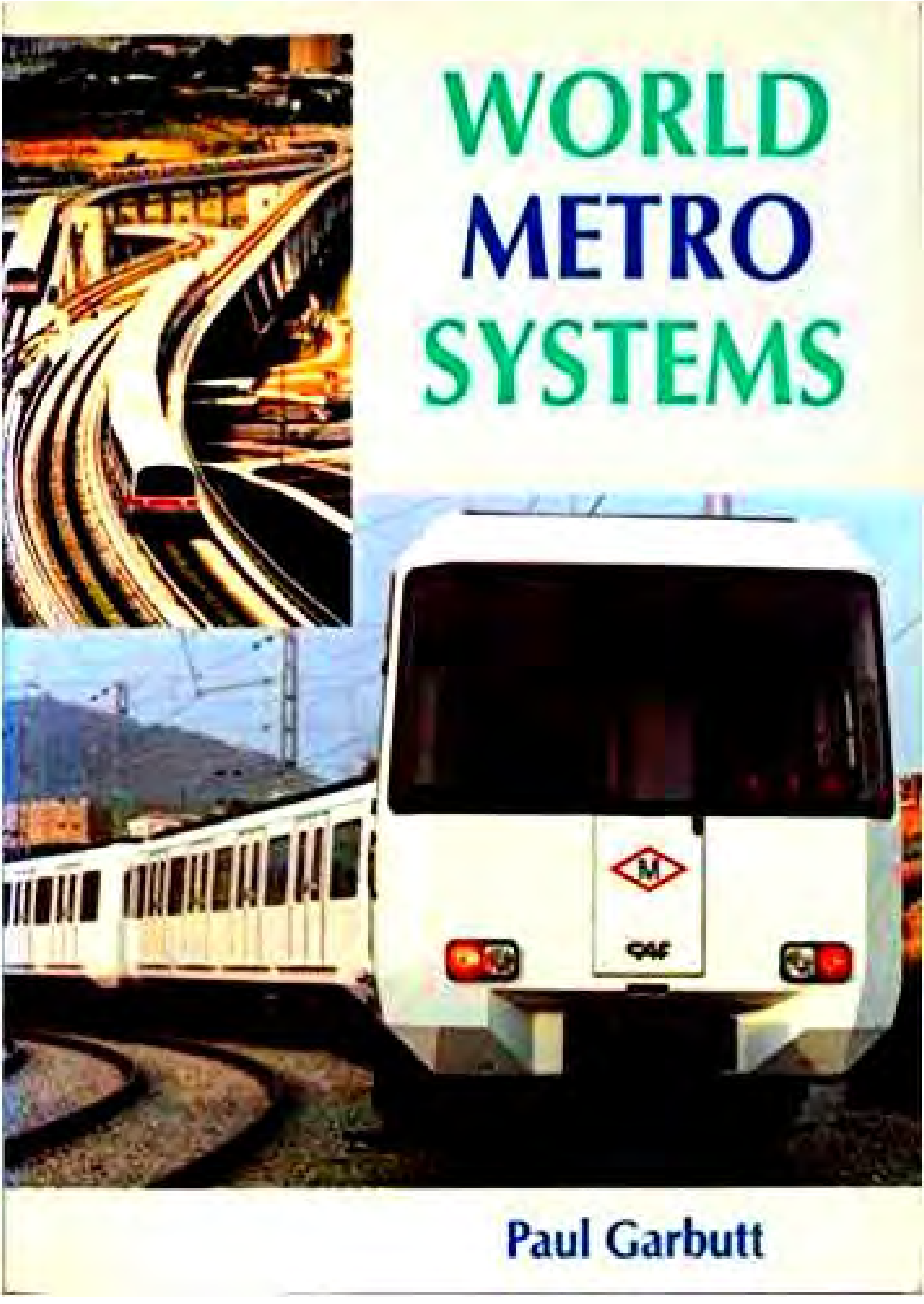
Metro Rail Projects - 13 Cities



Operational km – City wise		Under Construction km – City Wise	
Delhi	- 230	Mumbai	- 175
Bengaluru	- 42.3	Delhi & NCR	- 130
Hyderabad	- 30	Kolkata	- 108
Kolkata	- 27.4	Bengaluru	- 72
Chennai	- 27.4	Hyderabad	- 42
Kochi	- 18.2	Nagpur	- 38
Gurgaon (Rapid Metro)	- 11.7	Ahmedabad	- 36
Mumbai (Line 1)	- 11.4	Pune	- 31
Mumbai Monorail	- 9	Chennai	- 27
Jaipur	- 9.6	Lucknow	- 14
Lucknow	- 8.5	Kochi	- 8
		Jaipur	- 3


OXFORD
METRO RAIL PROJECTS IN INDIA
A STUDY IN PROJECT PLANNING
With a Foreword by E. Sreedharan
M. Ramachandran

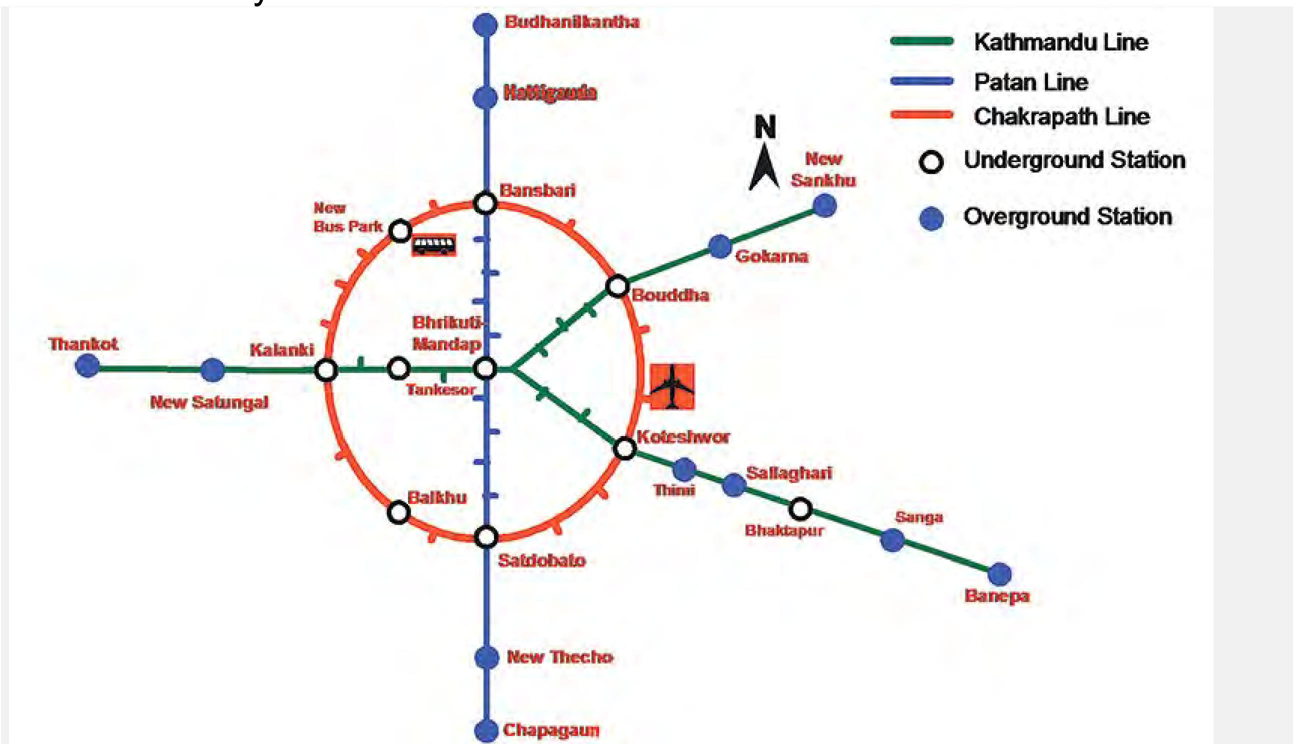
PART II: ACTIVITIES FOR URBAN MOBILITY SOLUTIONS INTERNATIONAL



Kathmandu needs Metro Rail; Nepal

- **Its introduction is vital for environmental sustainability, economic viability and improved quality of life**

- Binod L Amatya



Apr. 4, 2017-

'Kathmandu is choking and the government is joking!' A popular slogan going viral on social media, it is a fair description of the state of the Capital at present. Latest studies show that pollutants in Kathmandu's air are five times more than the World Health Organisation's guidelines. The latest pollution index by city ranked Kathmandu sixth globally. These data reflect the present situation; the Valley is rapidly becoming a bowl of dust and smoke. The unprecedented increase in the number of two- and four-wheelers, narrow roads, poor engineering practice during road widening schemes or road works are some of the main factors turning Kathmandu into 'Dustmandu'. Time is running out to tackle the problems of traffic congestion and air pollution. The capital will grind to a standstill in the next few years if immediate action is not taken. An ultimate solution to these problems is the introduction of a mass rapid transit line through an electrified metro rail system in the Valley.

Recently, the Kathmandu Metropolitan City (KMC) signed a Memorandum of Understanding on conducting a technical and financial feasibility study for an elevated monorail system in the city. This indicates that the KMC is gradually realising the need for a new mode of transport. However, it is doubtful if it has fully comprehended the nature and size of the transport problem the city is facing.

A monorail system has a slim and light body structure, and so the authority could argue that it would be more feasible for Kathmandu's narrow roads. However, it is necessary to understand that the capacity of a monorail system is very limited, catering to only 3,000 to 4,000 passengers per direction per hour. For Kathmandu, a densely populated and rapidly growing city, a metro rail system should be provided instead.

The proposed monorail system is a short-sighted vision, as the limited capacity would not solve the major transportation problem the city is facing. A monorail system could be appropriate for subsidiary lines serving short distance feeder travel with low passenger volume. Such a system would be more appropriate for developing urban areas outside the core urban zone.

Three Lines

Kathmandu is in need of a mass rapid transit system covering a wide part of the city, which can operate efficiently at a much greater capacity. A metro rail with a transport capacity of 20,000 to 50,000 passengers per direction per hour is required to meet present and future traffic needs. This applies particularly to the major transport arteries that will be built through and around the central areas of the Valley. The area within the Ring Road is the central zone of activity with major businesses and government administrative centres; it is also home to approximately 2 million people. For such a congested and densely populated region, a monorail system would not be adequate. To deal with Kathmandu’s current and future transport chaos, immediate development of a metro system is essential.

The Kathmandu, Patan and Chakrapath lines are proposed as the principal rail transport routes. The Kathmandu line will connect the eastern and western parts of the Valley through central Kathmandu. This 54km-long line will connect Thankot with Sankhu and Banepa via Bhrikuti Mandap. Likewise, the Patan line will connect the southern and northern parts of the Valley through the city centre. This 25km-long line will connect Chapagaun with Budhanilkantha via Bhrikuti Mandap. The Chakrapath line—about 30km long—is proposed as an orbital line.

These three lines will serve as the Valley’s major transport arteries. Details will only be ascertained after a proper study; however, a capacity ranging from 20,000 to 50,000 passengers per direction per hour would not be an unrealistic estimate. International standard track gauges or equivalents should be adopted; if the civil structures are built robustly, the capacity could be enhanced by simply increasing the number of coaches.
A societal asset.

Lessons can be learned from metro development in other Asian cities such as Bangkok and Delhi. Bangkok has operated the BTS sky train system since 1999; it has a capacity of up to 25,000 passengers per hour per direction, and daily ridership is about 600,000. Likewise, Delhi’s metro, operational since 2002, has a capacity of about 50,000 passengers per hour per direction.

A monorail system could be built with limited investment. A cheaper solution is clearly very attractive. Some claim that a monorail system could cost at least 80 percent less than a metro rail system. However, the city should not build infrastructure that will be outdated in a few years. Lack of timely and proper investment could potentially have huge consequences.

A metro rail system is essential for the regeneration of our city. Once built, such transport infrastructure will become a societal asset for generations. Such assets should be sufficiently resilient and their planning should be relevant for at least the next 20 years. A cheaper solution such as monorail is attractive and may work in the short-term, but our city needs a sustainable transportation system. The benefits of an effective rail transportation infrastructure is clear—it will boost economic growth, create jobs, regenerate communities, connect people and places, enhance the quality of life and foster environmental sustainability.

Building Kathmandu's first metro railway will present many engineering challenges. Some 60km of tunnels and 45km of viaducts will be required for the proposed three principal train lines. The capital city will only be able to carry out this bold mission with proper vision, policy, planning, strategy and investment.

All residents and businesses of the Kathmandu Valley should oppose narrow visions, unsustainable policies and inappropriate planning, and support the implementation of robust city infrastructure such as the metro rail. The introduction of a metro system is vital for environmental sustainability, economic prosperity and an improved quality of life in Kathmandu.

Amatya is a chartered civil engineer and ground-engineering specialist currently practising in the UK .

Published: 04-04-2017 10:13

Kabul Municipality unveils first Metro Bus System; Afghanistan

Kabul municipality also signed an agreement for the construction of 285 kilometers in roads in Kabul with a private company.

Kabul municipality on Thursday announced plans for the first phase of a metro bus system in the capital, the first major urban public transportation scheme in the country.

Abdullah Habibzai, the acting mayor of Kabul said the first phase of the metro bus system in Kabul will start from Sarai Shamali and run through to Baraki Square.

It will be completed within a year. Kabul will have 111 kilometers of metro bus system within the next three years, he said.

He said that the bus system will help cut down on traffic in the nation’s most populated city.

“The first line of the metro bus system will be operational in 1397 (2018), this is the start of the work, we will start the second phase of the project at the end of the year,” said Habibzai.

Kabul municipality also signed an agreement for the construction of 285 kilometers in roads in Kabul with a private company.

Habibzai said government will ensure the electronic monitoring of the construction of the new roads in order to make sure that these roads are built properly.

“This would be the first time that we will electronically monitor the construction, everyone is able to see our website to assess the contracts and oversee the progress of the contract, the citizens are even able to monitor the contract on daily basis,” added Habibzai.

Meanwhile, second vice president Mohammad Sarwar Danish has said that still many citizens in the country have no access to urban services.

He stressed the need for transparency in collecting revenue by Kabul municipality so as to improve services.

“With consideration of the extent of the city, population and activities, if the revenue of Kabul municipality is tackled effectively, this could be effective in curbing the problems,” said Danish.

Kabul municipality officials have said that the municipality is planning to establish a 610 kilometer road network in the city this year.

Danish said government plans to conduct municipal elections within one or two years - simultaneously with the country's parliamentary and district council elections.

Kabul to have its first Metro Bus System; Afghanistan

in Afghan Business

15 **Jun., 2017**by Wadsam

Kabul municipality unveiled the city's first metro bus system– the first major urban public transportation scheme in the country– on Thursday.

The first phase of the project, running from Sarai Shamali to Baraki Square, will be operational in 2018.

According to Kabul's acting mayor Abdullah Habibzai, Kabul will have 111 kilometers of metro bus system within the next three years.

Habibzai said the metro bus system will cut down on the city's traffic which has become a never-ending challenge.

The municipality also signed an agreement for the construction of 285 kilometers in roads in Kabul with a private company.

Habibzai said the construction of the roads will monitored electronically to make sure they are built properly.

"For the first time we will be able to monitor a project electronically. Everyone will have access to our website to assess the contracts and oversee the progress of the contract, including the citizens," said Habibzai.

Meanwhile, second vice president Mohammad Sarwar Danish called for transparency in revenue collection system of Kabul municipality to improve services.

First-ever Metro Bus Project launched in Kabul; Afghanistan

Reconstruction

First-ever metro bus project launched in Kabul

By

Azizullah Hamdard

On

Jun 15, 2017 - 16:00

KABUL (Pajhwok): The Kabul Municipality on Thursday announced launching work on the first-ever metro bus project in the capital, a scheme that would take one year to complete.

While signing contracts for 16 road construction projects in Kabul, Mayor Abdullah Habibzai told a press conference the launch of the metro bus project was a matter of pleasure.

He said the first metro line with four kilometres length and 60 meters width would start from the Parwan Soyem Square and extend to Sara-i-Shamali Square.

“This is good news for Kabul residents and we would witness the first metro bus running in early 1397. We plan to work on similar projects in other parts of Kabul later this year.

“We will have 111 kilometres of metro bus lines in the capital three years,” he said.

The construction of the 111 kilometers metro bus road would cost $15 million to be paid by the municipality. A contract for the construction of a 285 kilometres road in Kabul was also signed today.

“Another project for asphalting a 90 kilometers road is also in the procurement plan. In total, 375 kilometres of roads would be constructed this year under the two projects,” the mayor said.

Habibzai said the road projects would be implemented in 15th, 16th, 22nd, 12th, 11th, 13th, 17th, 9th, 8th, 4th, 5th, 10th and 7th police districts.

He did not provide information about the total cost of the 16 projects, but said the municipality’s plans for the current year included graveling roads, brick-lining streets, building a surface water system, parks and providing other services that would cost $113 million.

He called building recreational parks in Kabul as a top priority for the municipality, saying six of such parks would be built in the capital this year.

Vice-President Sarwar Danish, who also participated in the meeting, hailed the acting mayor as an honest and professional person. He hoped Habibzai would become a permanent mayor in near future. He asked for the appointment of mayors based on elections.

Danish expressed concern at the lack of school buildings, clinics, parks and standard roads in some parts of Kabul. He asked the municipality to resolve the problems in coordination with other relevant organs.

mds/mud

Afghanistan starts Work on its first Metro Bus Service; Afghanistan

With an estimated 4 million inhabitants, Afghan capital Kabul has no effective public transport system

home > world, asia - pacific 15.06.2017

Kabul, Afghanistan FILE PHOTO By Shadi Khan Saif

KABUL, Afghanistan

Amid rapid urbanization in the Afghan capital Kabul, the local municipality on Thursday started work on a metro bus service in the city of four million.

The historic old city of Kabul, which has now evolved into a bustling metropolis with an estimated 4 million inhabitants, literally has no effective public transport system though it had electric trams speeding over in the downtown before the Soviet invasion and subsequent civil war in the 1980s.

Abdullah Habibzai, mayor of Kabul, announced on Thursday that the ground work for the first phase of metro service has begun.

“The first metro bus would commute passengers from Saray Shamali to Baraki Square… people would see it in practice early next year,” he said while announcing the awarding of 16 new contracts to private firms for road construction stretching to some 285 kilometers (117 miles) in the city.

Present on the occasion, Sarwar Danish, second vice president, urged Kabul residents to own the city, and help the government keep it clean and green.

According to ‘The City Mayors Foundation’, an international think-tank dedicated to urban affairs, Kabul is the sixth fastest growing city in the world with an annual average growth of 4.74 percent.

Why does Pakistan not have a Metro Railway?; Pakistan

In Pakistan due to mismanagement, political turmoil in Past led to negligence of government in public transportation systems in cities . Though Pakistan was among the first countries in Asia to start inter city electric trains in 1960s .

Currently Orange Line (Urdu: نارنجی خط) is an under-construction rapid transit line being built as part of the Lahore Metro , in Lahore, Pakistan(will get completed by 2018 elections) . The Orange Line will be Pakistan's first modern rail-based mass rapid transit transit system and will be a **fully automated and driverless system.** It will be Lahore's second rapid transit line, after the Lahore Metrobus, which was completed in record 11 months in 2013 , which along with other development projects enabled Sharif’s Muslim league to defeat ruling Pakistan Peoples Party in the 2013 election .

Metro Train Carraiges have already arrived in Lahore

BRTs - Metro Bus Rapid Transport

At present Pakistan have most organized BRT systems in South Asia , there are four metro Bus Rapid Transit systems operating in Pakistan in Lahore , Rawalpindi , Islamabad , Multan . While BRT systems in Karachi Metrobus one of the world's most extensive BRT system & Faisalabad will get complete by 2018.

Peshawar Metro initiated by Imran khan's PTI led provincial government will get completed by the end of 2019 . All BRTs systems in Pakistan are having completely segregated lines with alleviated , underground tracks unlike in Dehli BRT .

All BRTs tracks are convertable to Metro trains lines within a decade a part of long term planning, they all have e-ticketing systems with free WiFi . Currently 18m long Swedish articulated buses are used on it . ***Rupees 20 is charged for a ticket .***

Metro Bus Stations in Islamabad-Rawalpindi (above) , Lahore Metro Bus (below) BRT

Dedicated “Right-of-Way” Metro Bus Lane, Lahore, Pakistan

Multan elevated “Right-of-Way” Metro Bus Station, Lahore

First BRT system in Lahore in 2013 was built with Turkish assistance , Karachi BRT would be unique as one of its under construction line (Blue line) would be entirely built by a private real estate group , which is first of its kind in Asia . Lahore Metro rail and Karachi

Circular Railway are being constructed under CPEC . Quetta[1] too will get an suburban Railway system by 2019 .

Though modern Metro rail in Lahore is being built and in Karachi Circular Railway is getting revived but apart from Karachi , building metro rail might not be much profitable . Metro rail are suitable for only those cities which are having ridership of more than 200,000 per day , so for time being other smaller Pakistani cities shall improve their metro BRT systems instead of wasting money at expensive Metro rails .

Future Projects

By 2019 there would be Four rail based metro systems in each of the provincial capitals (Lahore , Karachi , Quetta , Peshawar)and six BRT[2] Metro Bus systems in different large industrial cities (four already completed)

Light Rail Project

Baluchistan provincial government have started construction of Light rail metro in Quetta .Once completed , it would be first of its kind in Pakistan . Light rail metro are suitable for smaller cities like Quetta it is more environment friendly and cost effective , popular in North America and Japan .

Karachi Metrobus - Wikipedia

Peshawar Circular Railway - Wikipedia

Rawalpindi-Islamabad Metrobus - Wikipedia

Multan Metrobus - Wikipedia

Faisalabad Metrobus - Wikipedia

Lahore Metrobus - Wikipedia

Footnotes
[1] Quetta Mass Transit Train feasibility finalised

Wikipedia:

Lahore Metro (Urdu: لاہور میٹرو) is an automated rapid transit system under construction in Lahore, Punjab, Pakistan.[1] Three metro lines have been proposed, of which the Orange Line is under construction. When operational in March 2019, it will become Pakistan's first metro line.[2][3]

Lahore Metro
لاہور میٹرو

Punjab Mass Transit Authority logo

Overview	
Owner	Government of Punjab
Locale	Lahore, Punjab, Pakistan
Transit type	Rapid transit
Number of lines	3 (1 under construction)
Operation	
Operation will start	March 2019
Operator(s)	Punjab Mass Transit Authority
Technical	
System length	27.1 km (16.8 mi)
Track gauge	1,435 mm (4 ft 8 ½ in) standard gauge

Contents

History**Edit**

The Lahore Metro was first proposed in 1991 and reviewed again in 1993 by the *Lahore Traffic & Transport Studies*, funded by the World Bank. The project was subsequently shelved.[4] In 2005, the Ministry of Transport revisited the project and carried out a feasibility study. In 2007, the Asian Development Bank provided Rs1 billion (US$9.5 million) to conduct a study on the project.[5] The initial plan called for an 82 km (51 mi) rail network with 60 stations to be constructed in four separate phases. The first phase involved the construction of a 27 km (17 mi) rail line between Gajju Matta and Shahdara Bagh, with an 11.6 km (7.2 mi) section underground. Construction was expected to start in 2008 and be completed by 2010.[5] However, in 2008, the project was shelved again as priorities shifted to other projects.[6] In June 2010, Malaysia based Scomi International proposed a US $1.15 billion monorail–based alternative, however the project was not approved.[5] In May 2014, an agreement was signed so that the construction of the Orange Line could begin. Chief Minister Punjab Shahbaz Sharif signed the agreement at a ceremony alongside President Mamnoon Hussain and Chinese President Xi Jinping. The project is estimated to cost $1.6 billion.[7]

LinesEdit

Orange LineEdit

Main article: Orange Line (Lahore Metro)

The Orange Line is a 27.1-kilometre (16.8 mi) line under construction.[8] The Orange Line (Lahore Metro) will be 27.1-kilometre (16.8 mi) long, of which 25.4 kilometres (15.8 mi) will be elevated.[8]

Blue LineEdit

Main article: Blue Line (Lahore Metro)

The *Blue Line* is a proposed 24 kilometres (15 mi) line from Chauburji to College Road, Township.

Purple LineEdit

Main article: Purple Line (Lahore Metro)

The *Purple Line* is a proposed 32 km Airport rail link.

See alsoEdit

- Karachi Circular Railway
- Pakistan Railways
- Transport in Pakistan
- Peshawar Metrobus
- Lahore Metro Bus

ReferencesEdit

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2. ^ *"More delays and a new date for Pakistan's first metro train". Geo News. 3 August 2018. Retrieved 13 August 2018. Construction work on Pakistan's first metro train service is 90 per cent complete, but it won't be up and running till March 2019, say officials.*
3. ^ *"Manufacturing of orange trains starts, says Kh Hassan". The News. 26 May 2016. Retrieved 24 January 2017. Latest technology will be employed for fabricating these trains and the rolling-stock will be fully computerised, automatic and driverless.*
4. ^ Asian Development Bank 2008, p. 2.
5. ^ a b c The Express Tribune 2011.
6. ^ Asian Development Bank 2009.
7. ^ Daily Times 2011.
8. ^ a b *"City to lose 620 trees for Orange Line train". Dawn. 26 June 2015. Retrieved 4 March 2016.*

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Further readingEdit

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- *"Lahore mass transit system". DAWN. Pakistan. 2007-07-12.*

External linksEdit

- Lahore Guide

Related articles

- Transport in Pakistan
- Transport in Lahore
- Orange Line (Lahore Metro)

Lahore Rapid Mass Transit Rail Project; Pakistan

Posted on August 20, 2007
Filed Under >Owais Mughal, Economy & Development, Travel

Owais Mughal

Last month there have been several news items about the **Lahore Rapid Mass Transit (LRMT)** Rail project. We have tried to gather key information from many of these news items and will present it in the following as one concise post on the topic.

The proposed rail service is the main part of the **Lahore Mass Transit System (LRMTS).** Other components of this project include the now under construction **Lahore Ring Road** Project.

The Photo above shows the Route Map of LRMT Phase I – Green Line

The **LRMT** is a **Two-phase, 97 kilometes long** project. A Hong Kong based company called **MVA Asia Consultancy** was hired the government of Punjab as consultants to prepare the project feasibility. The study of **MVA Asia Consultancy** completed 5% of project design and proposed four Rail lines in the city to share the traffic burden. The proposed capacity of LRMT is going to be able to move **35000 passengers per hour** in the city. Funding for the project will be provided by the **Asian Development Bank (ADB)**.
PHASE I:

In **Phase-I** two tracks will be constructed. One will be a North-South route called the **Green Line** and other will be a East-West route called the **Orange Line**.

Green Line:

Green Line is going to cost US **$2.4 billion** to construct.

The **Green Line** would extend from **Shahdara** to **Hamza Town** via **Ravi Road, Lower Mall, Mall Road, Fatima Jinnah Road, Qartaba Chowk** and **Ferozepur Road** areas.

The Photo above shows the Route Map of LRMT Phase I – Green Line

The length of Green Line is going to be **27 km**. **11.6 km** long Green Line route would be underground, while **15.4 km** long would be overhead.

There will be **12 underground** and **10 overhead** stations built on the Green Line route.

The completion dates of **'Green Line'** is in **2011**. Initially the project was supposed to finish in 2012 but due to Cricket World Cup od 2012 wher Lahore will be hosting few matches, the Green Line completion date has been pulled in to 2011. Initial estimates are that 227,000 people annually would benefit from the Green line.

In **March 2007**, Punjab Government invited **Dr E. Sreedharan** who is the managing director of successfully operating **Delhi Metro Rail**. After studying the project details **Dr Sreedharan** has declared Green Line Project as a viable one. He has inspected the first priority line's route from Shahdara to Hamza Town. In his view, the implementation of the Green Line project (Phase I) would face no major technical difficulty because the soil condition en route was good and roads were wide, having room for underground construction without creating any serious inconvenience to the city.

Orange Line:

Orange Line is going to cost US **$1.9 billion**.

Its route would extend from **Pakistan Mint to Sabzazar** via **Shahnur, Awan Town, Hinjarwal, Niaz Beg, Canal View, Wahdat Road, Ali Town, Salahuddin Road, Bund Road, Islam Park, Dera Gujjran Depot, Mahmood Booti, Salamatpura, Samanabad, Gulshan Ravi, Chauburji, Lake Road, Lakshami Chowk, Railway Station, Sultanpura, UET, Baghbanpura** and **Shalimar Garden** areas.

The length of **Orange Line** would also be **27-km** out of which, **6.9 km** long tracks would be underground, while **20.2 km**-long would be overhead upon which **six** underground and **20 overhead** stations would be established.

The **central interchange** station of Green and Orange lines would also be established besides linking these lines at **Ring Road, railway station, airport,** and **Sports City**.

The completion dates of **'Orange Line'** is in **2015**. Initial estimates are that 245,000 people annually would benefit from the Orange Train.

PHASE II:

The completion year for phase II is 2020.

In **Phase-II**, two more tracks will be laid out. These routes will be called **Blue Line** and **Purple Line**.

Blue Line:

The route length of blue line is going to be 24 km. The 'Blue Line' will start from Chauburji and end at College Road, sources said, adding that from Chauburji the line would pass through Mozang Chungi, Shadman Chowk, Jail Road, Mian Boulevard Gulberg, Mian Boulevard Garden Town, Faisal Town and end at College Road.

Purple Line:

The route length of Purple line is going to be 19 km. Purple line would start from Bhaati Chowk and end at Allama Iqbal International Airport. The line would pass through Bhaati Chowk, Brandreth Road, Railway Station, Allama Iqbal Road, Dharampura, Ghazi Road and end at Allama Iqbal International Airport

The Train Capacity:

One unit of air-conditioned train will have the seating capacity of 500 passengers.

Stations:

Train stations on the elevated route would be designed like overhead bridges while train stations on the underground route would have two entranceways and two exits.

Environmental Concerns?

Just like with every Mega project, voices of dissent have started appearing for the project where people have shown concern for environment and noise levels of elevated trains. Dawn's editorial on Jult 12, 2007 covers these voices very concisely and I'll quite the editorial here:

The first two lines will cost $3.3 billion. In real terms, the cost of the project is yet to be worked out. Surely, notes of dissent are expected to start pouring in. The economists are going to question the heavy debt the project will incur for the government and the citizens, while the opposition politicians are most definitely going to give their own colour to these lines and the sabza group may soon be out to enumerate the effects of this development on Lahoreâ€™s environment. Some of these points may be very valid and should elicit a thoughtful response from the government. There can be no moving ahead without this exercise. The sooner this essential exercise is carried out the better it would be for everyone.

Noise: I couldn't find the details on expected noise levels around elevated portions of the track but noise is definitely going to travel far and away if sound barriers are not constructed around the tracks. More than normal decibels of noise are already witnessed around Pakistan Railway's elevated track which runs from Lahore Station to Badami Bagh.

Previous Light Rail Studies or Projects:

The current project is definitely not the first attempt to build a rail based mass transit for Lahore. In **1991** during Nawaz Sharif's termas prime minister, the feasibility of a light rail transit system was determined by **Japanese development organisation (JICA)**. It had proposed a **13 kilometre** long system. The study was reviewed and updated as part of the World Bank funded **"Lahore traffic and transport studies"** in **1993**.

The system's cost was estimated at about US **$400 million**, but with better network coverage. In **1995** Japan proposed financing the original scheme with grants and loans of about US **$495 million**, but the project could not be implemented due to many reasons.

Fares: Back in July 2007, it was reported in Daily Times that Passengers of the Lahore Rapid Mass Transit (LRMT) would be charged **Rs 125 to Rs 140** to travel from one end to the other of the **27 kilometre**-long Green Line.

"Sources associated with the project told Daily Times on Thursday that this (Rs 125-Rs 140) one-side fare had been calculated after taking into account the rendered $2.5 billion cost of the project, which is expected to be completed by 2011. Sources said that **to pay back the loan likely to be incurred on the LRMT project, the government would have to charge high fares from the passengers**. Currently, the public transport fare from Kahna to Shahdara is between Rs 20 to 25. By 2011, it would rise between Rs 25 and Rs 30. They said that to charge a passenger of the LRMT Rs 30 for a one-side visit, the **government would have to give a subsidy of at least Rs 100 per person, which was not possible** for the government.

While Rs 140 one way fare indeed looks ridiculous right now, passengers may end up paying much more than road transport. The benefiit however will be ease of travel, no traffic jams and hopefully a strict adherence to time table.

Hope: Many years ago I took a course in Engineering Economics. I still remember one sentence from my text book. It read as:

“All mega projects should be built as soon as possible after their design is done and funding is secured otherwise opposition to the project grows on **POLITICAL** basis.”

When we look around the mega projects of Pakistan, it appears so true. If big projecs are not started quickly they never will because somebody will always find a reason to do politics on the issue. In the end we sincerely hope the project sees the light of the day and does not end like the one in works for Karachi (called **KMTP/KCR**) for the past **33 years**. Lets all hope for the best and we will continue to add updates on this project in the comments section below.

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Dhaka Metro Rail; Bangladesh

From Wikipedia, the free encyclopedia

Dhaka Metro	
Overview	
Native name	Bengali: ঢাকা মেট্রো
Locale	Dhaka, Bangladesh
Transit type	Rapid transit
Number of lines	Total 5 lines.under construction: line 6 planned: lines 1, 5
Number of stations	under construction: 16 planned: 52

Daily ridership	2021 (projected): 483,000
Headquarters	Dhaka, Bangladesh
Website	http://www.dmtc.org.bd/
Operation	
Operation will start	2021[1]
Operator(s)	Dhaka Mass Transit Company Ltd.
Technical	
System length	20.10 km (12.49 mi)[2] (line 6)
Track gauge	Standard gauge
Electrification	1500V DC via overhead catenary

The Dhaka Metro (Bengali: ঢাকা মেট্রো) is an approved metro rail system under construction in Dhaka, the capital and largest city of Bangladesh. Together with a separate BRT (Bus Rapid Transit) system it has been long called for to solve the extreme amount of traffic jams and congestion that occur throughout the entire city on a daily basis, among the heaviest in the world. It is a part of the 20-year long Strategic Transport Plan (STP) chalked out by the Government's Transport Coordination Authority (DTCA).

Currently the metro rail system consists of one line referred to as the MRT (Mass Rapid Transit) Line-6, with other metro rail lines being added in the future. This Wikipedia article focuses mainly on Dhaka MRT Line-6.

The Dhaka Metro Rail Line-6 consists of 16 elevated stations each of 180m long and 20.1 km of electricity powered light rail tracks. MRT Line-6. All of Line-6, save for the depot, as well as some of its accompanying BRT, will be elevated above current roads primarily above road medians to allow traffic flow underneath, with stations also elevated.

Construction began on 26 June 2016 with an inauguration ceremony presided over by Sheikh Hasina. The civil work is being done by the Italian-Thai Development Public Company Limited and Sinohydro Corporation Limited JV and a Tokyo based construction company is developing the depot’s land.

Contents

Overview[edit]

The deal for construction of the 20.1 kilometres (12.5 mi)[7] Line 6, costing $2.8 billion, was signed by the Government of Bangladesh with the Japan International Cooperation Agency on 20 February 2013. This first route, originally projected to start from uttara, a northern suburb of Dhaka, to Sayedabad, in the south of the capital,[9] was eventually extended north to Uttara and truncated south to Motijheel.

Each train will hold up to 1800 passengers. With 56 trains to be in service by 2019, Dhaka Metro is projected to serve more than 60,000 passengers per hour by 2021, with wait times of approximately 4 minutes. The entire route will be able to be travelled in less than 40 minutes at an average speed of 100 km/h (62 mph), expected to drastically reduce the number of private cars on Dhaka's streets as well as their potentially 7-hour-long standstills.

During an interview with a local news paper, Md Mofazzel Hossain, Project Director of Dhaka Mass Rapid Transit Development Project said "The metro rail would be noise-free, with noise barriers and vibration-free lines, and the cars would be made of stainless steel and aluminium alloy". The system plans to use magnetic contactless Integrated Circuit Ticketing commonly also known as smart cards. Platform screening door (PSD) barriers used in the platform level will increase safety and increase efficiency.

When the service is in full operation, trains of six air-conditioned spacious cars will arrive every four minutes going each way at each of the 16 stations.

The project is being managed by the Communications Ministry's Dhaka Transport Co-ordination Authority, and a consortium of foreign as well as Bangladeshi firms known as NKDM Association is acting as General Consultant (GC). NKDM Association consists of: Nippon Koei Japan, Nippon Koei India, Delhi Metro Rail Corp (India), Mott MacDonald UK, Mott MacDonald India and Development Design Consultants (local consultant-Bangladesh) t.

Conception and Origin

In a view to implement Dhaka City's 20-year long Strategic Transport (STP), Bangladesh Government invited Japan International Cooperation Agency (JICA) to conduct a primary survey and feasibility study on the transport system of Dhaka back in 2009–2010. In 2012 the Government’s Executive Committee of National Economic Council (ECNEC) approved the project. A loan agreement between Bangladesh Government and JICA was signed in January 2013. The same year, Dhaka Mass Transit Company Ltd. (DMTC), the implementing agency of MRT Line-6 project was formed. The General Consultant (GC) namely the NKDM Association (See above) commenced work from February 2014.

In June 2013, Dhaka Mass Transit Company Limited (DMTC) was established by the Government to implement the Metro Rail Lines across the City. The project will be constructed under the supervision of (DMTCL) under the jurisdiction of Road Transport and Highway Division, Ministry of Road Transport and Bridges, Government of Bangladesh. Once complete, metro rail services would be operated by DMTCL.

Project Components, Dates and Progress

During an interview with daily sun, Md Mofazzel Hossain, Project Director of Dhaka Mass Rapid Transit Development Project said that the project will be implemented under eight construction packages (CP). The development components or construction packages include – CP-01 (Depot Land Development), CP-02 (Depot Civil & Buildings), CP-03, CP-04 (Viaduct & Stations, Uttara-Agargaon), CP-05, CP-06 (Viaduct & Stations, Agargaon-Motijheel), CP-07 (Electro-Mechanical Systems) and CP-08 (Rolling Stock & Depot Equipment).

Utility relocation from Mirpur-10 to Agargaon was planned to start August 2016, Other surveys have already been completed during the period of 2014 – October 2016 as mentioned by the project director Topographic Survey, Traffic Survey, Geotechnical Survey, Right of Way (ROW) Survey, Historical Importance/ Archeological (HIA) Survey, Environmental Baseline (EBL) Survey, Soil Electric Resistivity (SER) Survey and Utility Verification Survey.

As of May 2015 [update], soil testing for the line was completed, with construction for the first section having begun on 26 June 2016, and construction for the second section planned to begin in July 2017, for planned public operation by the end of 2019 and sometime in 2020, respectively.

A Japanese firm Tokyo Construction Ltd, is carrying out the depot land development work (CP-01). Tokyu Construction Ltd will develop the depot on a 23.84-hectare of land during the construction period at the cost of around ৳5.67 billion (US$73 million). He said the Pre-Qualification (PQ) of CP-02 has already done and 15 firms are qualified for this. Tender for CP-02 is already floated and the last date of the submission is 6 September this year. While asked about CP-03 and CP-04, he said PQ process has been done on 20 April this year. Tender has been invited and the last date of submission is 8 August 2016. But the date may be extended, he mentioned.

Route Alignment

Tentative alignments have been decided upon for the three initial metro lines. Only Line 6, as of 27 June 2016, has a definite station layout.

MRT Line 6

Legend

- Uttara North
- Uttara Centre
- Uttara South
- Pallabi
- Mirpur 11
- Mirpur-10
- Kazipara
- Shewrapara
- Agargaon
- Bijoy Sarani
- Farmgate
- Karwan Bazar
- Shahbag
- Dhaka University
- Bangladesh Secretariat
- Motijheel

Bangladesh Railway	
Lines	Narayanganj–Bahadurabad Ghat line Tongi–Bhairab–Akhaura line

	Akhaura–Kulaura–Chhatak line Akhaura–Laksam–Chittagong line Chilahati–Parbatipur–Santahar–Darshana line Burimari–Lalmonirhat–Parbatipur line Santahar–Kaunia line Iswardi–Sirajganj line
Defunct Lines	Jessore–Jhenidah Light Railway Kaunia–Dharlla State Railway Khulna–Bagerhat Railway The Cherra Companyganj State Railways
Passenger trains	Barisal Express East Bengal Express East Bengal Mail Maitree Express Bandhan Express Chitra Express Kapotaksha Express Shonar Bangla Express Parabat Express
Railway Bridges	Hardinge Bridge Jamuna Bridge Padma Bridge Rupsha Rail Bridge
Transit points with India	Rohanpur–Singhabad Darshana–Gede Benapole–Petrapole
Defunct transit points with India	Biral–Radhikapur Burimari–Changrabandha Chilahati–Haldibari Shahbajpur–Mahisasan Mogalhat–Gitaldaha
History	Eastern Bengal Railway Assam Bengal Railway Pakistan Eastern Railway
See also	Trans-Asian Railway Dhaka Metro Rail Chittagong Circular Railway

Category
Commons
Portal

Colombo Light Rail; Sri Lanka

From Wikipedia, the free encyclopedia

Overview	
Area served	Western Region Megapolis
Locale	Colombo District/Western Region Megapolis
Transit type	Light Rail/Light Metro/Light Rapid Transit
Number of lines	7 (proposed)[1]
Operation	
Operation will start	After 2021
Character	Elevated or at grade
Train length	4 compartments (2020s-2035) 6 compartments (2035 and beyond)
Technical	
System length	75 km (47 mi)

The **Colombo Light Rail Transit System** (Sinhala: කොළඹ සැහැල්ලු දුම්රිය සංක්රමණ පද්ධතිය. Tamil: கொழும்பு இலகு ரக ரயில் அமைப்பு) (also referred to as the **Western Region Megapolis Light Rail Transit System**) is a metropolitan light rail system under construction serving the designated Western Region Megapolis area within the Colombo District, Sri Lanka.[1] The system is planned to be operated as a public-private partnership between the Government of Sri Lanka and selected private entities.[2]

Contents

Infrastructure[edit]

The system is expected to consist of 7 lines (with a mix of both elevated and at grade) and cover a total distance of 75km.[2] The project's construction is divided into 7 phases, with phase 1 encompassing the construction of part of RTS 1 (Fort to Union Place) and RTS 5 (Battaramulla to Malabe), along with the entirety of RTS 4 (scheduled to begin in late 2018/early 2019), and phases 2 through 7 expanding the network throughout the planned Western Region Megapolis.[2]

Tenders for phases 2 through 6 are scheduled to be called in mid-2018, with construction of the lines taking place simultaneously.[2] All seven phases are expected to be operational by 2023, and cost a total of $6 billion.[2] An extension into the Colombo International Financial City is planned; further expansions beyond 2023 are also planned, with possible extensions of the network to cover Homagama, Horana and Mirigama.[2][3]

Phase 1[edit]

Construction/engineering feasibility studies, an environmental impact assessment and a social impact assessment for phase 1 (carried out by Seoyoung Engineering) began in late November 2017, and are slated for completion by June 2018[2][4]. Tenders are also due to be called for the selection of investors for a central maintenance depot.[2] Phase 1 covers 25km with 16 planned stations on two lines, and a planned travel time of 27 minutes.[2][5]

Stations in Phase 1 of the Colombo Light Rail project

Phase 1, costing $1.25 billion, is funded by a concessionary loan from Japan.[2][6][7]

Lines[1][edit]

					Termini								
Name (temporary)	Map colour	Status	Type	Length	RTS 1	Green	No. Stations	Feasibility study ongoing (Fort	Elevated	15 kilometres (9.3 mi)	For t	For t	*TBD*

Name	Map	Status	Type	Lengt	Termini		No.	
								to Union Place)
RTS 2	Orange	Feasibility study pending	Elevated	11.5 kilometres (7.1 mi)	Fort	Mattakuliya (Western branch) Peliyagoda (Eastern branch)	*TBD*	
RTS 3	Red	Feasibility study pending	Elevated	10 kilometres (6.2 mi)	Dematagoda	Bambalapitiya	*TBD*	
RTS 4	Purple	Feasibility study ongoing	Elevated/at grade	10 kilometres (6.2 mi)	Borella	Battaramulla	*TBD*	
RTS 5	Pink	Feasibility study ongoing (Battaramulla to Malabe)	Elevated/at grade	9.6 kilometres (6.0 mi)	Battaramulla	Kottawa	*TBD*	
RTS 6	Olive	Feasibility study pending	Elevated/at grade	6 kilometres (3.7 mi)	Malabe	Kaduwela	*TBD*	
RTS 7	Grey	Feasibility study pending	Elevated/at grade	10 kilometres (6.2 mi)	Peliyagoda	Kadawatha	*TBD*	

See also[edit]

- Rail transport in Sri Lanka
- Transport in Sri Lanka
- Ministry of Megapolis and Western Development

References[edit]

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Japanese Loan to fund Colombo Light Rail Project; Sri Lanka

01 Aug 2016

SRI LANKA: The Japanese government is to provide a soft loan for the construction of a light rail network in Colombo. The announcement by Western Region Megapolis Project Chairman Ajita de Costa followed the visit of a Japanese delegation led by Vice Minister for Economy, Trade & Industry Hirofumi Katase on July 26-27.

The loan would be used towards the initial 25 km of elevated alignment. Longer-term plans envisage a mix of elevated and at-grade sections covering 75 route-km. There would be three routes in the central business district of Colombo, and a further four lines extending to the suburbs of Kollupitiya, Bambalapitiya, Borella, Maradana, Rajagiriya, Battaramulla and Malabe. Hitachi and Taisei have reportedly expressed interest in the project.

The lines are to be built to support the development of the urban agglomeration centred on Colombo and taking in the Gampaha and Kalutara districts. This is envisaged to have 9·1 million inhabitants by 2035.

External links[edit]

- Official branding and design concepts for the CLR

from "https://en.wikipedia.org/w/index.php?title=Colombo_Light_Rail&oldid=874555623"
Categories:

- Rail transport in Colombo District

METRO NEWSLETTERS
on
URBAN MOBILITY

PUBLIC MULTIMODAL URBAN, SUBURBAN AND INTERURBAN PASSENGER TRANSIT SYSTEMS WITH METRO-BUS, LIGHT-RAIL, METRO-RAIL, REGIONAL RAPID TRANSIT, COMMUTER-RAIL, ROPE-WAY/TRAIN, WATER-METRO, AUTOMATED PEOPLE-MOVER

TRANSPORTATION AND ECONOMIC DEVELOPMENTS IN MODERN URBAN/MEGAPOLIS ENVIROMENT

METRO Newsletter by Dr. F.A. Wingler
METRO 14, January 2019

Integrated Kochi Water Metro, India

PART I: ACTIVITIES FOR URBAN MOBILITY SOLUTIONS IN INDIA

KMRL signs agreement with KfW for Integrated Water Transport Project; India

Kochi Water Metro

Kochi Metro Rail Ltd. (KMRL), the Government of Kerala (GoK) and the German funding agency, KfW signed the Project Agreement at 12.00 noon on 18th June 2016, in the presence of the Hon'ble Chief Minister, Shri. Pinarayi Vijayan at the Kerala House, New Delhi, for implementing the Rs.747 crore Integrated Water Transport project for the Greater Kochi region. The Project Agreement was signed by Shri. Elias George, Addl. Chief Secretary (Transport) on behalf of GoK, Shri. Abraham Oommen, Director (Finance) on behalf of KMRL and Mr. Peter Hilliges, Director on behalf of KfW.

This is the first time in India that such a significant level of investment is being brought in for improving urban water-borne passenger traffic. The city of Kochi will also be the first city in India to have water connectivity as a feeder service to the metro. As a matter of fact, the new boats under the project will provide the same transportation experience as the metro, and will be called `Kochi Water Metros'.

The project would be financed by the Indo-German Bilateral Cooperation, under the 'climate friendly urban mobility' plan.

The total cost of the project is Rs.747 crore, excluding Rs.72 crore for land acquisition, of which KfW would give financial assistance to the extent of 85 million Euros, i.e. approximately Rs. 597 crore as a long term soft loan. Rs.102 crore would be contributed by the Government of Kerala.

The Hon'ble Chief Minister of Kerala, Shri. Pinarayi Vijayan, who is in charge of Kochi Metro had taken a special interest in clearing all formalities on a war-footing so that the Project Agreement could be signed on the 18th of June 2016.

The major part of the project is procurement of modernised boats. Two variants of air-conditioned and Wi-Fi enabled catamaran passenger ferries, with passenger capacity of 50 and 100 respectively are envisaged. The boats would operate at an optimal speed of 8 knots, with the potential to increase up to 12 knots, once the dedicated water transit corridor is established.

Apart from the development of the ferry service, the project also proposes development of the existing and new access roads providing increased accessibility to the jetties and enhanced mobility within the islands, infrastructure for ensuring safety and security to all its users by way of active and well-lit streets & CCTV cameras, promoting use of small occupancy feeder modes such as mini/midi feeder buses & electric rickshaws to access the jetties, promoting property development around the jetties & place making, non-motorised transport infrastructure, facilities and infrastructure enabling smooth disabled-friendly mobility, and public bicycle sharing schemes including development of bicycle docking stations at all the jetty locations.

The major jetties or the main boat hubs shall be developed with Wi-Fi enabled social recreational opportunities around the jetty locations. Tourism is also proposed to be promoted as part of the project. 16 out of 38 jetties would be developed in the first Phase. Intelligent Navigation System and Operation Control Centre (OCC) are proposed to be integrated with the city's intelligent transportation system. The Automatic Fare Collection system being implemented by the Kochi Metro would be extended to the water transport system.

The ultimate objective of KMRL is to make the entire public transportation system one seamless entity, with a single ticketing, a single network and a single `Command and Control' over all modes of transport, including the metro, the buses and the boats. KMRL is confident that with the implementation of this Integrated Water Transport project over the next 4 years, with the creation of the Unified Metropolitan Transport Authority (UMTA), and with seamless interchange between the metro, the buses and the boats, people will migrate from using personal transport like cars towards public transportation, as is the practice in most modern cities across the world.

Narendra Modi opens roll-on roll-off Ferry in Gujarat; India

Narendra Modi has launched a ferry service from Ghogha to Dahej, the Vadodara City command control centre and the Waghodiya regional water supply scheme in Gujarat

Last Published: Mon, Oct 23 2017. 12 56 AM IST

Gyan Varma

Prime Minister Narendra Modi performing 'Poojan' at Ghogha Sea Ferry Point to mark the Inauguration of Ghogha-Dahej Ro-Ro Ferry Service, in Ghogha, Bhavnagar, Gujarat on Sunday. Photo: PTI

New Delhi: Prime Minister Narendra Modi on Sunday said development and the well-being of citizens was the priority of the BJP-led government at the centre and in Gujarat, where assembly elections are due this year
.
Modi was in Gujarat to launch a slew of projects, including a ferry service from Ghogha to Dahej, the Vadodara City command control centre, the Waghodiya regional water supply scheme and the new head office of the Bank of Baroda.

"We are clear in our working. All our resources will be spent towards the well being of every citizen. Our priority is development. The scale of development works being inaugurated in Vadodara is unprecedented," Modi told a public meeting in Vadodara.

The announcement of several development projects is crucial because the assembly polls in Gujarat will witness a direct contest between the Bharatiya Janata Party and the opposition Congress.

"Since I was a child, I was hearing about a ferry service from Ghogha to Dahej. It was not done all these years because development was never a priority for them (Congress). When we (BJP) got a chance to serve we focussed on all-round development and the ferry is operational today," Modi said.

During his visit to Vadodara, Modi also handed over keys of houses to beneficiaries under the Pradhan Mantri Awas Yojana (urban and rural) and laid the foundation stone for several infrastructure and development projects, including an integrated transport hub, regional water supply schemes, housing projects and a flyover.

The prime minister also laid the foundation stone for the capacity expansion of the Mundra-Delhi petroleum product pipeline and a greenfield marketing terminal project of Hindustan Petroleum Corp. Ltd (HPCL).

First Published: Sun, Oct 22 2017. 09 13 PM IST

PART II: ACTIVITIES FOR URBAN MOBILITY SOLUTIONS INTERNATIONAL

METRO – urban and suburban public Transport System – has many Manifestations

Kottawe Hub as multi-modal Relais-Station for Highway-Bus-, City Road-Bus- and Rail-MRT-Service, Colombo Sri Lanka

Wuppertal suspended Sky Train, Germany

Quingdao Sky Train Metro, China

Public Rope-Way Transport System in La Paz, Bolivia

Hamburg public Water Transport System, Germany

Kochi Water Metro, India

Inauguration of public Ferry Transport System in Gujarat

Dubai Airport Underground Metro People Mover

Dual Mode Tram-Train, Karlsruhe-Freudenstadt, Germany

Runs as City Stree-Tram and as regional Intercity Commuter Railway

World's first autonomous 'Skytrain' now in China; is 3X better than Subway Trains; China

According to the report, Chinese engineers say that 'Skytrain' can perform nearly three times better than regular subway trains and can ascend gradients of 100 meters over a distance of 1,000 meters. Designed as a lightweight, intermediate speed, medium traffic volume, and low-cost transport system, the 'Skytrain' reportedly has huge market potential in scenic areas, mountainous regions, and major cities.

In the transport technology, China has recently experimented with an autonomous ‘Skytrain', the elevated monorail, which was put on trial operation in Qingdao, eastern China's Shandong Province, said CGTN report.

According to the report, Chinese engineers say that 'Skytrain' can perform nearly three times better than regular subway trains and can ascend gradients of 100 meters over a distance of 1,000 meters.

Designed as a lightweight, intermediate speed, medium traffic volume, and low-cost transport system, the 'Skytrain' reportedly has huge market potential in scenic areas, mountainous regions, and major cities.

Made by CRRC Qingdao Sifang Co. Ltd, the suspension train will reportedly be able to carry up to 510 passengers in three to five carriages, with the maximum running speed of 70 km per hour.

"This monorail train uses the latest permanent magnet motor technology, which enables it to have the advantages of larger power, smaller physical volume, lower noise, and lighter weight, thus realizing better operating efficiency," Liu Yuwen, technical director of the project, told CGTN. Liu Yuwen further stated that the sky train will be able to provide passengers with a safe and comfortable ride through steep and rugged mountainous regions.

Rollercoaster Railway: New 'Sky-Train' graces the Skies of China's Qingdao; China

Chinese Engineers have begun testing the Country's fastest-ever Suspension Railway, which can carry Commuters to Work at a top Speed of 70kmph

The first trains have started running on China's new suspension railway, the country's fastest-yet elevated railway, which is located in Qingdao, Shandong Province.

The so-called "Skytrain" is able to ascent 100-meter gradients over a distance of 1,000 meters and is suitable for use in both mountainous regions and major cities. It has already broken speed records during testing, project engineers told China's CTGN news.

This monorail train uses the latest permanent magnet motor technology, which enables it to have the advantages of larger power, smaller physical volume, lower noise, and lighter weight, thus realizing better operating efficiency," explained Liu Yuwen, technical director of the project.

The suburban train has a maximum speed of 70km/h and can transport up to 510 passengers in three or five carriages.

The new line in Qingdao is China's second suspended railway after a lithium battery-powered suspended train line was completed in Chengdu last year, where the trains can run at a top speed of 60km/h.

China is the third country in the world to develop suspension railways, after Germany and Japan. The world's first suspension railway was built in the German city of Wuppertal in 1901 and is still operational today.

Japan`s Chiba Urban Monorail, which was built in 1988, is the world's most extensive suspension railway, comprising two lines totaling 15.2km in track length.

Wuppertal Suspension Railway; Germany

Source Wikipedia

Wuppertal Suspension Railway
(Wuppertaler Schwebebahn)

Wuppertal Suspension Railway

Railway logo

Overview	
Locale	Wuppertal, Germany
Transit type	Suspension railway
Number of lines	1
Number of stations	20
Daily ridership	82,000[1]
Operation	
Began operation	1 March 1901; 117 years ago (1901-03-01)
Operator(s)	Wuppertaler Stadtwerke (WSW)
Technical	
System length	13.3 km (8.3 mi)
hideSystem map	

Legend		
		Depot and turning loop
	0.0	Oberbarmen
	0.7	Wupperfeld
		L419 Brändströmstraße
	1.3	Werther Brücke
	2.0	Alter Markt
		7 Friedrich-Engels-Allee
	2.8	Adlerbrücke
	3.3	Loher Brücke
		L433 Loher Straße
	4.1	Völklinger Straße
	5.1	Landgericht
		7 Bundesallee
	5.8	Kluse/Schauspielhaus
		7 Bundesallee
		L70 Morianstraße
		Alte Freiheit
	6.3	Hauptbahnhof
	6.8	Ohligsmühle
		7 Bundesallee
		L427 Tannenbergstraße
	7.4	Robert-Daum-Platz
	8.2	Pestalozzistraße
	8.8	Westende
	9.7	Varresbecker Straße
	10.3	Düsseldorf–Elberfeld railway
	10.4	Zoo/Stadion
	10.5	Former turning loop
	10.6	Start of the Overland section.
		228 Sonnborner Straße

	11.0	Sonnborner Straße
	11.3	46 Sonnborner Kreuz
	11.7	Hammerstein
	12.5	Bruch
		224 Gräfrather Straße
	13.3	Vohwinkel Schwebebahn
		Main workshops, depot and turning loop

This diagram:
view
talk
edit

The Wuppertal Suspension Railway (German: Wuppertaler Schwebebahn) is a suspension railway in Wuppertal, Germany.

Its full name is "Electric Elevated Railway (Suspension Railway) Installation, Eugen Langen System" (Anlage einer elektrischen Hochbahn (Schwebebahn), System Eugen Langen). It is the oldest electric elevated railway with hanging cars in the world and is a unique system.

Designed by Eugen Langen to sell to the city of Berlin, the installation with elevated stations was built in Barmen, Elberfeld and Vohwinkel between 1897 and 1903; the first track opened in 1901. The Schwebebahn is still in use today as a normal means of local public transport, moving 25 million passengers annually (2008).

The suspension railway runs along a route of 13.3 kilometres (8.3 mi), at a height of about 12 metres (39 ft) above the River Wupper between Oberbarmen and Sonnborner Straße (10 kilometres or 6.2 miles) and about 8 metres (26 ft) above the valley road between Sonnborner Straße and Vohwinkel (3.3 kilometres or 2.1 miles).[5][6] At one point the railway crosses the A46 motorway. The entire trip takes about 30 minutes.[6] The Wuppertal Suspension Railway operates within the VRR transport association and accepts tickets issued by the VRR companies.

Contents

History[edit]

The Wuppertal Suspension Railway had a forerunner: in 1824, Henry Robinson Palmer of Britain presented a railway system which differed from all previous constructions. It was a low single-rail suspension railway on which the carriages were drawn by horses. Friedrich Harkort, a Prussian industrial entrepreneur and politician, loved the idea. He saw big advantages for the transportation of coal to the early industrialised region in and around the Wupper valley. Harkort had his own steel mill in Elberfeld; he built a demonstration segment of the Palmer system and set it up in 1826 on the grounds of what is today the Wuppertal tax office. He tried to attract public attention to his railway plans
.
On 9 September 1826, the town councillors of Elberfeld met to discuss the use of a "Palmer's Railway" from the Ruhr region, Hinsbeck or Langenberg, to the Wupper valley, Elberfeld, connecting Harkort's factories. Friedrich Harkort inspected the projected route with a surveyor and a member of the town council. The plans never went ahead because of protests from the transport branch[clarification needed] and owners of mills that were not on the routes.

In 1887 the cities of Elberfeld and Barmen formed a commission for the construction of an elevated railway or Hochbahn. In 1894 they chose the system of the engineer Eugen Langen of Cologne, and in 1896 the order was licensed by the City of Düsseldorf.[6][7] In 2003, the Rhine Heritage Office (Rheinisches Amt für Denkmalpflege des Landschaftsverbandes Rheinland or LVR) announced the discovery of an original section of the test route of the Wuppertal Suspension Railway.

Construction on the actual Wuppertal Suspension Railway began in 1898, overseen by the government's master builder, Wilhelm Feldmann. On 24 October 1900, Emperor Wilhelm II participated in a monorail trial run.

In 1901 the railway came into operation. It opened in sections: the line from Kluse to Zoo/Stadion opened on 1 March, the line to the western terminus at Vohwinkel opened on 24 May, while the line to the eastern terminus at Oberbarmen did not open until 27 June 1903.[5] Around 19,200 tonnes (18,900 long tons; 21,200 short tons) of steel were used to produce the supporting frame and the railway stations. The construction cost 16 million gold marks. The railway was closed owing to severe damage during World War II, but reopened as early as 1946.[5]

Construction of Wuppertal Suspension Railway, 1900

Werther Brücke station in 1913

A GTW 72 train crossing an intersection

A train in Wuppertal in 2010

The Kaiserwagen

Generation 15 train at Vohwinkel depot

Modernization

The Wuppertal Suspension Railway nowadays carries approximately 80,000[1] passengers per weekday through the city. Since 1997, the supporting frame has been largely modernized, and many stations have been reconstructed and brought technically up to date. Kluse station, at the theatre in Elberfeld, had been destroyed during the Second World War. This too was reconstructed during the modernization. Work was planned to be completed in 2001; however a serious accident took place in 1999 which left five people dead and 47 injured. This, along with delivery problems, delayed completion. In recent years (2004), the cost of the reconstruction work has increased from €380 million to €480 million.

On 15 December 2009 the Schwebebahn suspended its operations for safety concerns; several of the older support structures needed to be renewed, a process that was completed on 19 April 2010.

On 10 November 2011 Wuppertaler Stadtwerke (Wuppertal public utility company) signed a contract with Vossloh Kiepe to supply 31 new articulated cars to replace those built in the 1970s. The new cars were built in Valencia, Spain. When they were introduced the line's power supply voltage was raised from 600 to 750 V.

In 2012, the Wuppertal Suspension Railway was closed for significant periods to upgrade the line. The closing times were 7 to 21 July, 6 August to 22 October and weekends in September (15/16) and November (10/11).

The modernization was completed and the line fully reopened on 19 August 2013.

Post 2015 Trains Replacement[

In 2015 a new fleet of Generation 15/GTW 15 trains, assembled by Vossloh España in Valencia, was commissioned to gradually replace the ageing GTW 72 fleet with the first new train entering regular passenger service on 18 December 2016. The new trains feature a light blue livery and have cushioned seating, air conditioning, information displays, LED lights, improved disabled access and induction motors with energy recovery during braking. WSW announced it would not scrap any of the GTW 72 stock but instead offer 21 of the vehicles for sale and three for free as long as they remain in the city of Wuppertal.

Stations[edit]
Oberbarmen – eastern terminus
Wupperfeld
Werther Brücke
Alter Markt
Adlerbrücke
Loher Brücke
Völklinger Straße
Landgericht
Kluse
Hauptbahnhof
Ohligsmühle
Robert-Daum-Platz
Pestalozzistraße
Westende
Varresbecker Straße
Zoo/Stadion
Sonnborner Straße
Hammerstein
Bruch
Vohwinkel – western terminus

Werther Brücke Station

Zoo/Stadion Station

Sonnborner Straße Station

Technology[edit]

Detail of Suspender, Wheel and Motor of a GTW 72 Train

The cars are suspended from a single rail built underneath a supporting steel frame. The cars hang on wheels which are driven by multiple electric motors operating at 750 volts DC, fed from an extra rail.

A vehicle leaving the Wagenhalle Oberbarmen Depot

The supporting frame and tracks are made out of 486 pillars and bridgework sections. When the line was originally built, Anton Rieppel, head of MAN-Werk Gustavsburg, designed the structural system, which he patented. At each end of the line is a servicing depot, including a loop of track to allow the trains to be turned around.

The current fleet consists of 31 articulated cars introduced in November 2011. The cars are 24 metres long and have 4 doors. One carriage can seat 48 with approximately 130 standing passengers. The top speed is 60 kilometres per hour (37 mph) and the average speed is 27 km/h (17 mph).

The Kaiserwagen (Emperor's car), the original train used by Emperor Wilhelm II during a test ride on 24 October 1900, is still operated on scheduled excursion services, special occasions and for charter events.

Incidents

15 January 1917

A train rear-ended another train that had stopped unexpectedly in front of it between Oberbarmen and Wupperfeld, causing the trailing car of the stopped train to fall off the track. There were two minor injuries. Subsequently, a safety device was developed to make derailments nearly impossible.

21 July 1950

The Althoff Circus organised a publicity stunt by putting a baby elephant on a train at Alter Markt station. As the elephant started to bump around during the ride, she fell out of the car and into the river Wupper. The elephant, two journalists, and one passenger sustained minor injuries. After this jump, the elephant got the name Tuffi, meaning 'waterdive' in Italian. Both operator and circus director were fined after the incident.

11 September 1968

A truck crashed into a pillar and caused a section of track to fall. There were no trains in the area at the time. This incident led to the use of concrete walls in pillar anchors.

25 March 1997

A technical malfunction caused a rear-end collision in Oberbarmen station between a structure train and the Kaiserwagen. There were 14 injuries, but no derailment.

Incident of 12 April 1999, near Robert-Daum-Platz Station

12 April 1999

The line's only fatal incident occurred close to Robert-Daum-Platz station during maintenance work in the early morning hours of 12 April 1999. Workers had forgotten to remove a metal claw from the track on completion of scheduled night work. The first eastbound train of the day hit the claw at a speed of around 50 km/h (31 mph), derailed, and fell about 10 metres (33 ft) into the river Wupper, killing 5 passengers. The salvage operation took 3 days and nights to complete. 8 weeks after the incident the Schwebebahn returned to operation. The cost of the damage was approximately 8 million marks.

The judicial proceedings following the incident highlighted that the disaster was not caused by technical defects or system failure, but by negligence by workers having fallen behind in their schedule during the preceding night, and abandoning the work site hastily 10 minutes before the train departed from the depot. Contributing to the circumstances was a lack of control of their activities by site supervisors.

The Works Manager in charge of safety and the workers dealing with the steel claw at the time were acquitted of all charges by the District Court of Wuppertal. The site supervision personnel, having neglected their duties of control, were sentenced for involuntary manslaughter in 5 cases and bodily injury caused by negligence in 37 cases, but let off on probation with verdict 4 StR 289/01 dated 31 January 2002.

Aftermath of the collision with a crane, near Hammerstein Station, 5 August 2008

5 August 2008

A train collided with a crane truck making deliveries under the track, causing a 10-metre-long (33 ft) tear in the floor of one of the cars. The truck driver was seriously injured, and the train driver and some passengers were treated for shock.

17 October 2013

A section of power rail 100 metres (330 ft) long fell from the track onto Federal Route 7, damaging several cars parked there and forcing closure of the road. The city's fire service had to rescue 70 passengers from a stopped train. No one was injured.

In popular Culture

Literature[

The Schwebebahn is alluded to in Theodor Herzl's 1902 utopian novel Altneuland (The Old New Land). For Herzl, the Schwebebahn was the ideal form of urban transport, and he imagined a large monorail built in its style in Haifa.

Film

A sequence in Lyrical Nitrate, using film from between 1905 and 1915, features the Schwebebahn. Rüdiger Vogler and Yella Rottländer use images of the Schwebebahn in

Wim Wenders's 1974 movie Alice in the Cities (Alice in den Städten). It also appears in the 1992 Dutch movie The Sunday Child (De Zondagsjongen) by Pieter Verhoeff, in Tom Tykwer's 2000 film The Princess and the Warrior (Der Krieger und die Kaiserin) and as a background and to a number of outdoor dance choreographies in another Wim Wenders film – 2011's Pina, and some dances are set inside the cars.

The Schwebebahn is both subject and title of video work by the Turner Prize-nominated artist Darren Almond. Produced in 1995, Schwebebahn is the first of three videos that constitute his Train Trilogy.

Other Fiction

Some of the events in Le Feu de Wotan, a Belgian bande dessinée in the Yoko Tsuno series, take place in the Schwebebahn.

The denouement of the episode of the 1972 ITC TV series The Adventurer called "I'll Get There Sometime" takes place on the railway.

The Plane Train People Mover, Atlanta Airport; USA

From Wikipedia, the free encyclopedia

This article is about the underground people mover at Hartsfield–Jackson Atlanta International Airport. For the elevated people mover that serves the airport's rental car center, see ATL SkyTrain.

The Plane Train

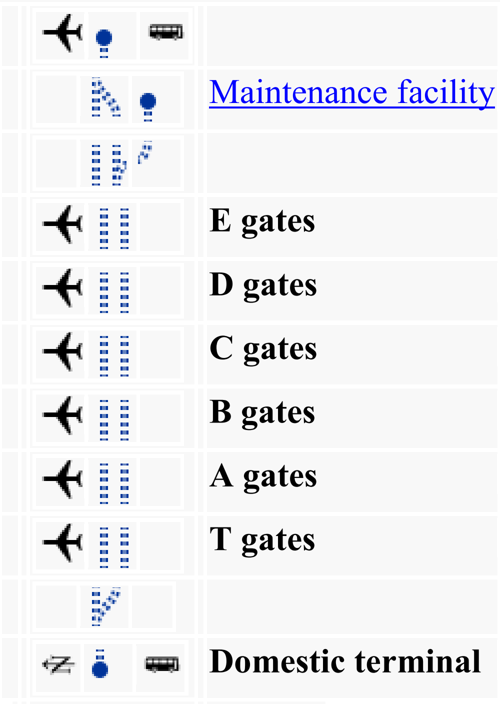
Concourse A Station

Overview	
Type	People mover
Locale	Hartsfield–Jackson Atlanta International Airport
Termini	Domestic Terminal International Terminal
Stations	8
Daily ridership	200,000[1]
Operation	
Opened	September 21, 1980
Character	Underground subway
Rolling stock	59 Bombardier Innovia APM 100 vehicles
Technical	
Line length	2.8 mi (4.5 km)

hide

Route map

Legend



This diagram:

- view
- talk
- edit

The Plane Train is an automated people mover (APM) at Hartsfield–Jackson Atlanta International Airport that transports passengers between the terminals and the airside concourses. The system is the world's most heavily traveled airport APM, with 64 million riders as of 2002.[2]

Contents

History[edit]

Centre Monorail guided Rubber tyred People Mover, Plane Train, Atlanta Airport, USA

The Plane Train opened along with the current airport terminal on September 21, 1980. The system was jointly built by Westinghouse Electric and Adtranz, who supplied the system's initial fleet of C-100 vehicles. The initial system consisted of the six stations from the terminal (now the Domestic Terminal) up to Concourse D.

In 1994, the system was extended with a new station for Concourse E (which was constructed for international flights in preparation for the 1996 Summer Olympics in Atlanta) and trains lengthened from three cars to four.[3]

In 2002, Bombardier Transportation, which had recently acquired Adtranz, replaced the system's original C-100 vehicles with new Innovia APM 100 vehicles.

Having operated without an official name since its opening, the system was officially given its current name of "The Plane Train" on August 10, 2010.[4]

In 2012, the Maynard Holbrook Jackson, Jr. International Terminal and Concourse F opened along with another extension of the Plane Train. Ten additional vehicles were added to the system to accommodate this expansion, bringing the total number of Innovia APM 100 vehicles in the system's fleet to 59.[5]

Operations[edit]

The Interior of the Innovia APM 100 Vehicles

The Plane Train operates in two tunnels bracketing the pedestrian walkway in the airport's Transportation Mall. The system has eight stations that are all within the secure area of the airport, one at each of Concourses A, B, C, D, E, and F (International Terminal), and two in the Domestic Terminal – one at Concourse T, which is also the station for passengers from the Domestic Terminal heading to Concourses A–F, and one at domestic baggage claim and ground transportation.

The Domestic Baggage Claim station, and stations for concourses T, E, and F have island platforms shared between the two tunnels, while stations at concourses A, B, C, and D each have separate platforms servicing each tunnel. Displays on the platforms announce the time of arrival for the next train and its destination. Each door on the platform also has a set of red lights that flash alternately to warn that the doors are closing, a feature present since the 1980s.

Inside the trains, color video displays provide station information in eight languages (English, French, German, Spanish, Japanese, Chinese, Arabic, and Korean) as well as information about dining and shopping options in the concourses. The original displays were English text-only dot-matrix red-LED displays, replaced before the Olympics with larger ones having a smaller dot pitch (and therefore higher resolution) capable of showing eastern Asian CJK characters.

Audible announcements deliver station information and warn passengers of the train's movements. The messages use the NATO phonetic alphabet to identify each concourse station. For example, the message announcing Concourse B says: "Welcome aboard the Plane Train. The next stop is for B Gates. B, as in Bravo." The one exception to this is Concourse D, which uses the APCO radiotelephony spelling alphabet where "David" is used rather than "Delta" to avoid confusion with Delta Air Lines, which operates its main hub at ATL.

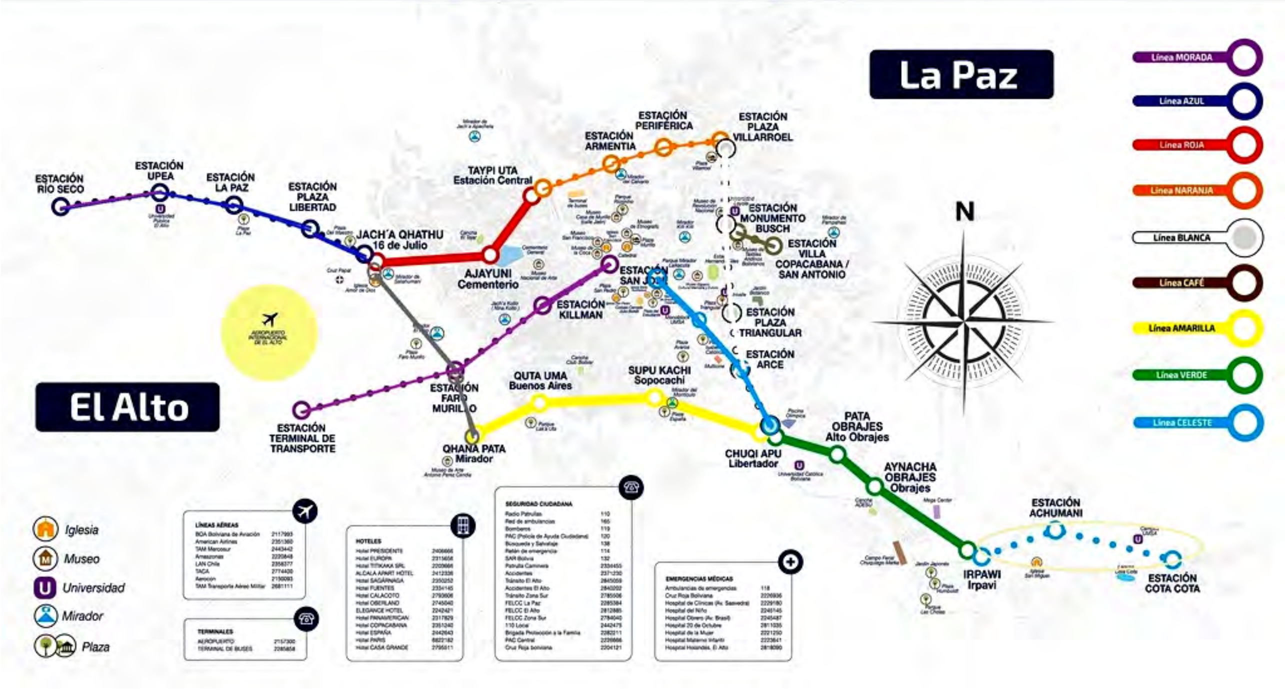
The audio announcements on the Plane Train have been delivered by five different voices throughout its history. Originally, the trains featured a monotone male synthesized voice. This was later replaced with a recorded male voice in conjunction with the extension to Concourse E in 1994; at the same time, sound effects were added. New announcements that debuted in 2002 when the vehicles were replaced did away with the sound effects and were provided by local voice talent Bill Murray[6] (not to be confused with actor/comedian Bill Murray). In 2006, new recordings using the phonetic alphabet were provided using the voice of Susan Bennett, who is the voice of Delta Air Lines gate boarding announcements at the airport and who has since become famous for being the voice of Siri.[7]

The current announcements, which debuted in March 2012, are provided by voice actress Sharon Feingold,[8] who also provides those for the ATL SkyTrain. They are the first to not use the word "concourse", instead referring to the concourse stations with the word "gates", e.g. "A Gates". They also added the name of the train, returned sound effects, and added announcements for the International Terminal and Concourse F.

While the in-vehicle voice changed throughout the years, the male voice continued to be used in the stations (including the Concourse F station when it first opened) during 1995–2002 to alert passengers when the doors close, by stating, "Careful. Doors are closing and will not reopen. Please wait for the next train," after a chime plays. This message has been updated with a new male voice and sound effects similar to the in-vehicle chime.

The end of the line is Concourse F / International Terminal. During peak hours, the trains will stop at the eastbound side of the platform, unload, and then proceed further to a cross-over track to return to the westbound side of the platform. During non-peak hours, trains cross-over prior to reaching the platform and arrive/depart from the westbound Concourse F platform.

Ropeway public Transport System La Paz; Bolivia



Mi Teleférico

From Wikipedia, the free encyclopedia

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Coordinates: 16°30′00″S 68°09′00″W / 16.50000°S 68.15000°W / -16.50000; -68.15000

Mi Teleférico

La Paz–El Alto Cable Car

Red Line cable car connecting La Paz and El Alto

Overview	
Native name	Mi Teleférico
Owner	Empresa Estatal de Transporte por Cable "Mi Teleférico"
Locale	La Paz, Bolivia
Transit type	Gondola lift
Number of lines	9 (2 in planning)[1][2]
Number of stations	27 (5 in planning)[1][2]
Website	www.miteleferico.bo
Operation	
Began operation	30 May 2014
Operator(s)	Empresa Estatal de Transporte por Cable "Mi Teleférico"
Number of vehicles	1255 gondola cars: 10 Person each 109 (Red Line) 169 (Yellow Line) 165 (Green Line) 208 (Blue Line)[3] 127 (Orange Line)[4] 131 (White Line)[5] 155 (Sky Blue Line)[6] 190 (Purple Line) 27 (Brown Line) 117 (Silver Line)

	106 (Gold Line)
Headway	12 sec
Technical	
System length	28 km (17 mi)
Average speed	11.2 mph (18.0 km/h)
Top speed	13.4 mph (21.6 km/h)
hideSystem map	

Mi Teleférico (Spanish pronunciation: [mi tele'feriko], English: My Cable Car), also known as Teleférico La Paz–El Alto (La Paz–El Alto Cable Car), is an aerial cable car urban transit system serving the La Paz–El Alto metropolitan area in Bolivia.[7] As of September 2018, the system consists of 25 stations along eight lines: Red, Yellow, Green, Blue, Orange, White, Sky Blue, and Purple. Another three lines are in planning or construction: Brown, Silver, and Gold.

Upon the completion of the 10-kilometre (6.2 mi) Phase One (Red, Yellow, and Green Lines) in 2014, the system was considered to be the longest aerial cable car system in the world. Based on its master plan, the completed system, which is being built by the Doppelmayr Garaventa Group, is intended to reach a length of 33.8 km (21.0 mi) with 11 lines and 30 stations. While other urban transit cable cars like Medellín's Metrocable complement existing rapid transit systems, Mi Teleférico is the first system to use cable cars as the backbone of the urban transit network. In 2018, Mi Teleférico won a Latam Smart City Award in the category of "Sustainable urban development and mobility".

Mi Teleférico was planned in order to address a number of problems, including a precarious public transit system that could not cope with growing user demands, the high cost in time and money of traveling between La Paz and El Alto, chaotic traffic with its subsequent environmental and noise pollution, and a growing demand for gasoline and diesel fuel, which are subsidized by the state. The Red, Yellow, and Purple lines connect the neighboring cities of La Paz and El Alto, which are separated by a steep slope about 400 m (1,300 ft) tall, and which were previously only connected by winding, congested roads.

Contents

History[, Background[

The neighboring cities of El Alto and La Paz are the second and third most populous cities in Bolivia. Despite their proximity, travel between the two has always been a challenge, due to a difference in elevation of about 400 m (1,300 ft). La Paz, the national capital of Bolivia, is located in a canyon on the Choqueyapu River, while El Alto, a poorer but growing city with a majority indigenous population, is located above it on the Altiplano plateau. Prior to the construction of the cable car, travel between La Paz and El Alto was limited to heavily crowded, winding streets, and the only public transit consisted of buses and minibuses that often got stuck in traffic.] In order to alleviate this situation, the idea of connecting the two cities with a cable car has been proposed several times since the 1970s.

In the 1970s, a team planned an aerial cable car route connecting the neighborhoods of La Ceja in El Alto and La Florida in La Paz.

In 1990, a feasibility study was undertaken for a cable car between La Ceja in El Alto and the Plaza de San Francisco in La Paz. The most controversial aspects of the plan were the fare, the low passenger capacity, and the proximity to the Basilica of San Francisco. During the 1991 municipal elections, the Conciencia de Patria (CONDEPA) party candidate argued against a cable car, claiming it would cost minibus drivers their livelihoods and impact privacy.

In the 1993 municipal elections, mayoral candidate Mónica Medina, also of the CONDEPA party, made aerial transit one of her campaign promises, modifying the original idea of a single line into a system of interconnected cable car lines with a hub on Lainkakota hill.

In 2003, the project returned to the table, but details such as tower placement stalled the work. The planned San Francisco terminal was moved to the Zapata soccer field near the Higher University of San Andrés, but the idea was still too controversial to move ahead.

In 2011, the Municipal Government of La Paz carried out a study on potential ridership demand, and found that the city handles 1.7 million trips per day, including 350,000 trips between La Paz and El Alto.

Phase One

In July 2012, Bolivian President Evo Morales Ayma drafted a bill for the construction of a cable car to connect El Alto with the center and south of La Paz and sent it to the Plurinational Legislative Assembly. Morales called together the mayor of La Paz, Luis Revilla, the mayor of El Alto, Édgar Patana, and the governor of the La Paz Department, César Cocarico, to participate in the project. The project was financed by the country's National Treasury with an internal loan from the Central Bank of Bolivia.

The system's Phase One consisted of the Red Line (Línea Roja), Yellow Line (Línea Amarilla), and Green Line (Línea Verde), which are also the colors of the Bolivian flag. Phase One was inaugurated and began operation on 30 May 2014.

Phase Two

On 1 July 2014, Evo Morales announced five new interconnected lines to be built in the coming years. On 26 January 2015, the law permitting construction of Phase Two was passed, increasing the number of new lines to six and committing US $450 million to the project. A seventh line was announced in February 2016,[14] and an eighth was announced in July 2016. Phase Two will extend the system by over 20 km (12 mi).[17][18] On 13 July 2017, it was announced that the cost of Phase 2 would be increased to US $506 million.

Phase Two began operation in 2017 with the inauguration of the Blue Line (Línea Azul) on 3 March 2017, followed by the Orange Line (Línea Naranja) on 29 September 2017. On 24 March 2018, the White Line (Línea Blanca) and the first section of the Sky Blue Line (Línea Celeste) were opened. The second and final section of the Sky Blue Line was opened on 14 July 2018. The remaining five lines will be the Purple Line (Línea Morada), the Brown Line (Línea Café), the Silver Line (Línea Plateada), and the Gold Line (Línea Dorada). As of March 2018, the Purple and Silver Lines are under construction.

Other Cities

Oruro[

Mi Teleférico contributed to the construction of the Teleférico Turístico "Virgen del Socavón" (Our Lady of the Mines Tourist Cable Car) in Oruro, Bolivia. The cable car connects the city center to the Virgen del Socavón statue and shrine on nearby Santa Bárbara hill, which plays an important role in the city's carnaval celebrations. The cable car, which opened on 7 February 2018, consists of a single 800-metre (2,600 ft) line with two stations and 16 cars. It has a capacity of 1000 passengers per hour, and a one-way trip takes approximately 3 minutes. The project was originally due to open in November 2016, but it suffered repeated delays until Mi Teleférico took over construction work in 2017.

Sucre

As of 2017, the Empresa Estatal de Transporte por Cable "Mi Teleférico" was in the process of planning a cable car system for the city of Sucre.

Lines

Lines in Operation

Yellow Line Cable Cars (view towards Libertador/Chuqui Apu)

Blue Line Station under Construction

The Mi Teleférico system consists of monocable aerial cable car lines. Most lines have a maximum capacity of 3000 passengers per hour, while the Sky Blue Line has a capacity of 4000 passengers per hour. The network has a total of seven lines, with 443 cars on the Red, Green, and Yellow Lines, 208 on the Blue Line, 127 on the Orange Line, 131 on the White Line, and 155 on the Sky Blue Line. Each car seats 10 passengers. Cars depart every 12 seconds, and the network is open 17 hours a day.

According to Mi Teleférico, the Red, Yellow, and Green Lines combined transport between 80,000 and 90,000 passengers per day. Of these, the Yellow and Red Lines, the two lines that link La Paz and El Alto, account for some 70,000 rides. During its opening week, the Blue Line moved 41,000 passengers in one day, and it has increased ridership on the Red Line by 15%.

Line	Terminus stations	Length	Travel time	Stations	Cabins	Capacity	Speed	Towers	Opened
Red Line	16 de Julio/Jach'a Qhathu _	2.4 km (1.5 mi)	10 min	3	109	3000 pphpd	5 m/s	19	30 May 2014

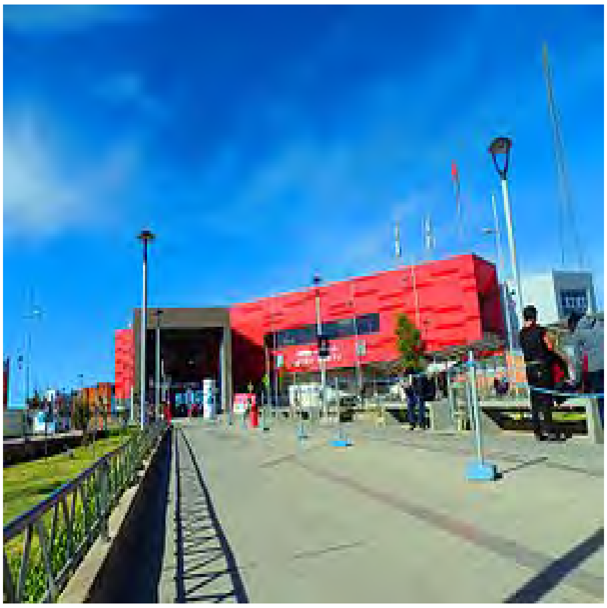
	Estación Central/Taypi Uta								
Yellow Line	Mirador/Qhana Pata – Chuqui Apu/Libertador	3.9 km (2.4 mi)	13.5 min	4	169	3000 pphpd	5 m/s	31	15 September 2014
Green Line	Chuqui Apu/Libertador – Irpawi/Irpavi	3.7 km (2.3 mi)	16.6 min	4	165	3000 pphpd	5 m/s	27	4 December 2014
Blue Line	Rio Seco/Waña Jawira – 16 de Julio/Jach'a Qhathu	4.7 km (2.9 mi)	17 min[35]	5	208	3000 pphpd	5 m/s	38	3 March 2017[3][20][21]
Orange Line	Estación Central/Taypi Uta – Héroes de la Revolución/Villarroel	2.6 km (1.6 mi)[22]	10 min	4	127	3000 pphpd	5 m/s	26	29 September 2017[22]
White Line	Plaza Villarroel – San Jorge	2.9 km (1.8 mi)	13.1 min	4	131	3000 pphpd	5 m/s	26	24 March 2018
Sky Blue Line	El Prado – Chuqui Apu/Libertador	2.6 km (1.6 mi)	11.8 min	4	155	4000 pphpd	6 m/s	26	Section 1: 24 March 2018 Complete Line: 14 July 2018
Purple Line	6 de Marzo – San Jose	4.3 km (2.7 mi)	16.2 min	3	190	4000 pphpd	6 m/s	34	28 September 2018
Brown Line	Monumento Busch – Las Villas[1][18]	0.7 km (0.43 mi)	3.8 min	2	27	2000 pphpd	5 m/s	7	20 December 2018

Future lines[edit]

Line	Terminus stations	Length	Travel time	Stations	Cabins	Capacity	Speed	Towers	Planned opening
Silver Line	16 de Julio/Jach'a Qhathu – Mirador/Qhana Pata[14]	2.6 km (1.6 mi)	11.7 min	3	117	3000 pphpd	5 m/s	21	April 2019
Gold Line	Irpawi/Irpavi – Cota Cota[2][26]	2.2 km (1.4 mi)	7.6 min	3	106	3000 pphpd	5 m/s		2020

Stations[edit]

Irpawi/Irpavi Station on the Green Line in La Paz.



16 de Julio/Jach'a Qhathu Station on the Red Line in El Alto.

Ciudad Satélite/Qhana Pata Station on the Yellow Line in El Alto

All stations have both a Spanish name and an Aymara name.

Red Line (Línea Roja)

Aymara name[1]	Spanish name	Connections	City	Notes
Taypi Uta	Estación Central	Orange Line	La Paz	former central railway station
Ajayuni	Cementerio		La Paz	main cemetery
Jach'a Qhathu	16 de julio	Blue and Silver Lines	El Alto	

Yellow Line (Línea Amarilla)[edit]

Aymara name[1]	Spanish name	Connections	City	Notes
Chuqui Apu	Libertador	Green and Sky Blue Lines	La Paz	
Suphu Kachi	Sopocachi		La Paz	
Quta Uma	Buenos Aires		La Paz	
Qhana Pata	Mirador	Silver Line	El Alto	

Green Line (Línea Verde)

Aymara name[1]	Spanish name	Connections	City	Notes
Irpawi	Irpavi	Gold Line (2020)	La Paz	
Aynacha Obrajes	Obrajes		La Paz	a free funicular provides access from Calle 17 to the station[36]
Pata Obrajes	Alto Obrajes		La Paz	
Chuqui Apu	Libertador	Yellow and Sky Blue Lines	La Paz	

Blue Line (Línea Azul)

Aymara name[35]	Spanish name[21]	Connections	City	Notes
Jach'a Qhathu	16 de julio	Red and Silver Lines	El Alto	
Qhana Thaki	Plaza Libertad		El Alto	
Suma Qamaña	Plaza La Paz		El Alto	
Yatina Uta	Plaza UPEA		El Alto	Universidad Pública de El Alto
Waña Jawira	Río Seco		El Alto	

Orange Line (Línea Naranja)

Aymara name	Spanish name	Connections	City	Notes
Taypi Uta	Estación Central	Red Line	La Paz	former central railway station

Riosinho Pampa	Armentia		La Paz		
Apachita	Periférica		La Paz		
Villarroel	Héroes de la Revolución	White Line	La Paz	underground station	

White Line (Línea Blanca)

Aymara name[24]	Spanish name	Connections	City	Notes
Jalsuri	San Jorge	Sky Blue Line	La Paz	
Kimsachata	Triangular		La Paz	
Qhuirwa Uma	Busch	Brown Line	La Paz	
Inalmama	Villarroel	Orange Line	La Paz	underground station

Sky Blue Line (Línea Celeste)

Aymara name	Spanish name	Connections	City	Notes
Chuqui Apu	Del Libertador	Yellow and Green Lines	La Paz	
Arce	Avenida Poeta	White Line	La Paz	
Cancha Zapata	Teatro al Aire Libre		La Paz	
Prado	Camacho		La Paz	

Purple Line (Línea Morada)

Aymara name	Spanish name	Connections	City	Notes
San José	Edificio Correos	Sky Blue Line	La Paz	
	Complejo de Integración Faro Murillo	Silver Line	El Alto	
6 de Marzo	Terminal de Transporte		El Alto	

Brown Line (Línea Café)

Aymara name	Spanish name	Connections	City	Notes
Qhuirwa Uma	Monumento a Busch	White Line	La Paz	
Las Villas	Villa Copacabana / Villa San Antonio		La Paz	

Silver Line (Línea Plateada)

Aymara name	Spanish name	Connections	City	Notes
Jach'a Qhathu	16 de julio	Red and Blue Lines	El Alto	
	Complejo de Integración Faro Murillo	Purple Line	El Alto	
Qhana Pata	Mirador	Yellow Line	El Alto	

Gold Line (Línea Dorada)

Aymara name[1]	Spanish name	Connections	City	Notes
Irpawi	Irpavi	Green Line	La Paz	
Achumani	San Miguel		La Paz	
Cota Cota	UMSA		La Paz	

Incidents

When the system first opened, riders experienced delays of 2 to 25 minutes, which the government attributed to technical problems and riders holding doors.

On February 14, 2015, a eucalyptus tree fell, striking an empty cabin on the Yellow Line, dislocating the cable and leaving passengers stranded for three hours. Nineteen passengers suffered bruises and other minor injuries, but there were no major injuries, and only minor damage to three cabins.

On May 9, 2016, a tower from the construction of the Blue Line fell, with nine injured and no deaths.

Intermodal Transfers

Beginning in December 2014, the Mi Teleférico and La Paz Bus systems began allowing passenger transfers at the Chuqui Apu station.

Mobile Application[

Mi Teleferico has released a mobile application for Android and Apple with information about existing and future lines.

List of Airport People Mover Systems; International

From Wikipedia, the free encyclopedia
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Tampa International Airport People Movers

This is a list of automated people mover systems located at airport complexes around the world. These systems are used to transport people from one location within an airport to another. Many different types of people movers are used at airports, including automated guideway transit, monorail, and maglev.

Contents

Africa

Country/Region	City	Airport	Transit system
Egypt	Cairo	Cairo International Airport	Cairo International Airport Automated People Mover

Asia

Country/Region	City	Airport	Transit system
China	Beijing	Beijing Capital International Airport	Terminal 3 People Mover
	Hong Kong	Hong Kong International Airport	Hong Kong International Airport Automated People Mover
Indonesia	Jakarta	Soekarno–Hatta International Airport	Soekarno–Hatta Airport Skytrain[1]
Japan	Tokyo	Narita International Airport	Narita Airport Terminal 2 Shuttle System (defunct)
	Osaka	Kansai International Airport	Wing Shuttle
Malaysia	Kuala Lumpur	Kuala Lumpur International Airport	KLIA Aerotrain
Qatar	Doha	Hamad International Airport	Hamad International Airport People Mover
Singapore	Changi	Singapore Changi Airport	Changi Airport Skytrain
South Korea	Seoul	Incheon International Airport	Incheon Airport Maglev
Thailand	Bangkok	Suvarnabhumi Airport	Suvarnabhumi Airport Automated People Mover
Taiwan	Taipei	Taoyuan International Airport	Taoyuan International Airport Skytrain
United Arab Emirates	Dubai	Dubai International Airport	Dubai International Airport Automated People Mover

Europe

Country/Region	City	Airport	Transit system
France	Paris	Charles de Gaulle Airport	CDGVAL
		Orly Airport	Orlyval
Germany	Düsseldorf	Düsseldorf Airport	Düsseldorf SkyTrain
	Frankfurt	Frankfurt Airport	SkyLine

			The Squaire Metro
	Munich	Munich Airport	PTS
Italy	Rome	Rome Leonardo da Vinci Fiumicino Airport	SkyBridge
Russia	Moscow	Sheremetyevo International Airport	Interterminal underground passage
Spain	Madrid	Adolfo Suárez Madrid–Barajas Airport	Madrid Barajas Airport People Mover
Switzerland	Zurich	Zürich International Airport	Skymetro
United Kingdom	Birmingham	Birmingham International Airport	AirRail Link
	London	London Gatwick Airport	Gatwick Airport Transit
		London Heathrow Airport	Transit Train
			ULTra
		London Stansted Airport	Stansted Airport Transit System
	Luton	Luton Airport	Luton DART (planned)

North America

Country/Region	City	Airport	Transit system
Canada	Toronto, Ontario	Toronto Pearson International Airport	LINK Train
Mexico	Mexico City	Mexico City International Airport	Aerotrén
United States	Atlanta, Georgia	Hartsfield-Jackson Atlanta International Airport	ATL SkyTrain
			The Plane Train
	Cincinnati, Ohio	Cincinnati/Northern Kentucky International Airport	Cincinnati Airport People Mover
	Chicago, Illinois	O'Hare International Airport	Airport Transit System
	Dallas/Fort Worth, Texas	Dallas Love Field	Jetrail (defunct)
		Dallas/Fort Worth International Airport	Skylink
			Airtrans APM (defunct)
	Denver, Colorado	Denver International Airport	Denver International Airport Automated Guideway Transit System
	Detroit, Michigan	Detroit Metropolitan Wayne County Airport	ExpressTram
	Houston, Texas	George Bush Intercontinental Airport	Skyway
			Subway
	Las Vegas, Nevada	McCarran International Airport	McCarran International Airport Automated People Movers
	Los Angeles	Los Angeles International Airport	LAX Train (under construction)
	Miami, Florida	Miami International Airport	MIA e Train
			MIA Mover
			Skytrain
	Minneapolis,	Minneapolis-St. Paul	Minneapolis-St. Paul Airport

	Minnesota	International Airport	Trams
	New York City, New York	John F. Kennedy International Airport	AirTrain JFK
		LaGuardia Airport	AirTrain LaGuardia (proposed)
	Newark, New Jersey	Newark Liberty International Airport	AirTrain Newark (monorail)
	Oakland, California	Oakland International Airport	Coliseum–Oakland International Airport line
	Orlando, Florida	Orlando International Airport	Orlando International Airport People Movers (airside systems)
			Orlando International Airport People Movers (Intermodal Terminal system)
	Phoenix, Arizona	Phoenix Sky Harbor International Airport	PHX Sky Train
	Pittsburgh, Pennsylvania	Pittsburgh International Airport	Pittsburgh International Airport People Mover
	Sacramento, California	Sacramento International Airport	SMF Automated People Mover
	San Francisco, California	San Francisco International Airport	AirTrain
	Seattle/Tacoma, Washington	Seattle-Tacoma International Airport	Satellite Transit System
	Tampa, Florida	Tampa International Airport	Tampa International Airport People Movers (airside systems)
			Tampa International Airport People Movers (monorail)
			Tampa International Airport People Movers (SkyConnect)
	Washington, D.C.	Washington Dulles International Airport	AeroTrain

South America

Country/Region	City	Airport	Transit system
Brazil	Porto Alegre	Salgado Filho International Airport	Aeromovel (link to Trensurb)
Colombia	Bogotá	El Dorado International Airport	El Dorado International Airport People Mover (planned)

References

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Categories:

- Airport people mover systems
- Rail transport-related lists

List of worldwide Metro Systems

City	Country	Name	Year opened	Year of last expansion	Stations	System length	Annual Ridership (millions)
Algiers	Algeria	Algiers Metro	2011[11]	2018[12]	19[12]	18.5 km (11.5 mi)[13]	30 (2017)[R 1]
Buenos Aires	Argentina	Buenos Aires Underground	1913	2018[Nb 1][14]	87[14]	54.7 km (34.0 mi)[14]	317.7 (2017)[R 2]
Yerevan	Armenia	Yerevan Metro	1981[15]	1996[16]	10[15]	13.4 km (8.3 mi)[15]	16.2 (2017)[R 3]
Vienna	Austria	Vienna U-Bahn	1976[17][Nb 2]	2017[18]	98[19]	83.3 km (51.8 mi)[17]	453.6 (2017)[R 4]
Baku	Azerbaijan	Baku Metro	1967[20]	2016[Nb 3]	25[20]	36.7 km (22.8 mi)[20]	228.8 (2017)[R 3]
Minsk	Belarus	Minsk Metro	1984[21]	2014[21][Nb 4]	29[22]	37.3 km (23.2 mi)[22]	284.1 (2017)[R 3]
Brussels	Belgium	Brussels Metro	1976[23]	2009[Nb 5]	59[23][Nb 6]	39.9 km (24.8 mi)[24]	151.6 (2017)[R 5]
Belo Horizonte	Brazil	Belo Horizonte Metro	1986[25]	2002[25]	19[26]	28.1 km (17.5 mi)[27]	58.8 (2017)[R 6]
Brasília	Brazil	Brasília Metro	2001[28]	2010[28]	24[29]	42.4 km (26.3 mi)[29]	36.6 (2017)[R 7]
Porto Alegre	Brazil	Porto Alegre Metro	1985[30]	2014[30]	22[31]	43.8 km (27.2 mi)[31]	55.1 (2017)[R 8]
Recife	Brazil	Recife Metro[Nb 7]	1985[32]	2009[32]	28[33]	39.5 km (24.5 mi)[33]	104.2 (2017)[R 9][R 6]
Rio de Janeiro	Brazil	Rio de Janeiro Metro	1979[34]	2016[35]	41[34]	58 km (36 mi)[35]	244.7 (2017)[R 10]
Salvador	Brazil	Salvador Metro	2014[36]	2018[37]	19[38]	32.5 km (20.2 mi)[37][39]	42 (2017)[R 11]
São	Brazil	São Paulo	1974[40]	2018[41]	82[41]	96 km	1295.4

City	Country	Name	Year opened	Year of last expansion	Stations	System length	Annual Ridership (millions)
Paulo		Metro				(60 mi)[41]	(2017)[R 12]
Sofia	Bulgaria	Sofia Metro	1998[42]	2016[43]	34[43]	40 km (25 mi)[43]	89.7 (2016)[R 13]
Montreal	Canada	Montreal Metro	1966	2007[Nb 8]	68[44]	71 km (44 mi)[44]	367.5 (2017)[R 14][R Nb 1]
Toronto	Canada	Toronto subway[45]	1954[46]	2017[46]	75[47]	76.9 km (47.8 mi)[48][49]	304.1 (2017)[R 14][R Nb 1][R Nb 2]
Vancouver	Canada	SkyTrain	1985[50]	2016[51]	53[51]	79.6 km (49.5 mi)[51]	151.4 (2017)[R 14][R Nb 1]
Santiago	Chile	Santiago Metro	1975[52]	2017	107[53]	118 km (73 mi)[53]	685.1 (2017)[R 15]
Beijing	China	Beijing Subway[54][55]	1971[Nb 9]	2017[56]	306[Nb 10]	599.4 km (372.4 mi)[57][Nb 11]	3777.9 (2017)[R 16]
Changchun	China	Changchun Subway	2011	2018[58]	59[Nb 12]	68.8 km (42.8 mi)[Nb 13]	n/a
Changsha	China	Changsha Metro	2014[59]	2016[60]	43[60]	50.2 km (31.2 mi)[60]	233.4 (2017)[R 16]
Chengdu	China	Chengdu Metro	2010	2018[61]	151	196.49 km (122.09 mi)	782.1 (2017)[R 17]
Chongqing	China	Chongqing Rail Transit	2005	2018[62]	154	266.2 km (165.4 mi)[62]	743.1 (2017)[R 17]
Dalian	China	Dalian Metro[63]	2003	2018[64]	69	153.5 km (95.4 mi)	157.2 (2017)[R 16]
Dongguan	China	Dongguan Rail Transit	2016[65]	–	15	37.8 km (23.5 mi)	38.7 (2017)[R 17]
Foshan	China	Foshan Metro[Nb 14]	2010	2015	22	34.4 km (21.4 mi)	n/a[R Nb 3]
Fuzhou	China	Fuzhou	2016[66]	2017[67]	21	24.89 km	49.3

City	Country	Name	Year opened	Year of last expansion	Stations	System length	Annual Ridership (millions)
		Metro				(15.47 mi)	(2017)[R 17]
Guangzhou	China	Guangzhou Metro	1997	2018[68]	199[69]	391.8 km (243.5 mi)[70]	2800 (2017)[R 18]
Guiyang	China	Guiyang Metro	2017[71]	2018[72]	25	34.3 km (21.3 mi)	n/a
Hangzhou	China	Hangzhou Metro[73]	2012	2018[74]	84	117.3 km (72.9 mi)	339.9 (2017)[R 17]
Harbin	China	Harbin Metro	2013[75][76]	2017[77]	21[75][76]	22.9 km (14.2 mi)[75][76]	113.3 (2017)[R 17]
Hefei	China	Hefei Metro	2016[78]	2017[79]	47	52.4 km (32.6 mi)	42.7 (2017)[R 17]
Hong Kong	China	MTR	1979[Nb 15]	2016[Nb 16]	93[80]	174.7 km (108.6 mi)[81]	1767.1 (2017)[R 19][R 20][R Nb 4]
Kunming	China	Kunming Rail Transit	2012	2017[82]	60	87.2 km (54.2 mi)	124.8 (2017)[R 17][R 21]
Nanchang	China	Nanchang Metro	2015	2017[83]	40	44.3 km (27.5 mi)	109.8 (2017)[R 17]
Nanjing	China	Nanjing Metro[84]	2005	2018[84][Nb 17]	159[85]	378 km (235 mi)[85]	977 (2017)[R 22]
Nanning	China	Nanning Rail Transit[86]	2016[87]	2017[88]	43	53.1 km (33.0 mi)[88]	97.1 (2017)[R 17]
Ningbo	China	Ningbo Rail Transit[89]	2014	2016[89]	51	74.5 km (46.3 mi)	112.3 (2017)[R 17]
Qingdao	China	Qingdao Metro	2015[90]	2018[91]	62	102.7 km (63.8 mi)	65.7 (2017)[R 17]
Shanghai	China	Shanghai Metro[Nb 18]	1993	2018	329[Nb 19][92][93]	644 km (400 mi)[92]	3537.6 (2017)[R 16]
Shenyang	China	Shenyang Metro	2010	2018[94]	48	59.7 km (37.1 mi)	319.1 (2017)[R 16]

City	Country	Name	Year opened	Year of last expansion	Stations	System length	Annual Ridership (millions)
Shenzhen	China	Shenzhen Metro	2004	2016[95]	199	286.2 km (177.8 mi)	1654.4 (2017)[R 23]
Shijiazhuang	China	Shijiazhuang Metro	2017	–	26	28.33 km (17.60 mi)	40.4 (2017)[R 17]
Suzhou	China	Suzhou Rail Transit	2012	2017[96]	97	118.9 km (73.9 mi)	248.2 (2017)[R 16]
Tianjin	China	Tianjin Metro	1984	2018[97]	144[98]	219.8 km (136.6 mi)[99]	351.5 (2017)[R 16]
Ürümqi	China	Ürümqi Metro	2018	–	12	16.56 km (10.29 mi)	n/a
Wuhan	China	Wuhan Metro	2004	2018[100]	190	288 km (179 mi)[100]	926.8 (2017)[R 16]
Wuxi	China	Wuxi Metro	2014[101]	2014[102]	45	56 km (34.8 mi)[101][102]	92.3 (2017)[R 17]
Xiamen	China	Xiamen Metro	2017[103]	–	24[103]	30.3 km (18.8 mi)[103]	n/a
Xi'an	China	Xi'an Metro	2011	2016[104]	66	90 km (56 mi)	605.3 (2017)[R 17]
Zhengzhou	China	Zhengzhou Metro	2013[105]	2017[106]	61	93.6 km (58.2 mi)[106]	252.3 (2017)[R 17]
Medellín	Colombia	Medellín Metro	1995[107]	2012[Nb 20]	27[107]	31.3 km (19.4 mi)[107]	208.1 (2017)[R 24]
Prague	Czech Republic	Prague Metro	1974[108]	2015[Nb 21]	58[109]	65.2 km (40.5 mi)[110]	435.6 (2017)[R 25]
Copenhagen	Denmark	Copenhagen Metro	2002[111]	2007[111]	22[112]	20.4 km (12.7 mi)[112]	63.5 (2017)[R 26]
Santo Domingo	Dominican Republic	Santo Domingo Metro	2009	2018[113]	34[113][114][115]	31.0 km (19.3 mi)[114][115]	76.5 (2017)[R 27]
Cairo	Egypt	Cairo Metro[116]	1987	2014[Nb 22]	61	77.9 km (48.4 mi)	1314 (2015)[R 28][R Nb 5]
Helsinki	Finla	Helsinki	1982[117	2017[Nb	25[119]	35 km	67.5

City	Country	Name	Year opened	Year of last expansion	Stations	System length	Annual Ridership (millions)
	nd	Metro	]	23][118]		(22 mi)[120]	(2017)[R 29]
Lille	France	Lille Metro	1983[121]	2000[121]	60[122]	45 km (28 mi)[122]	107.5 (2016)[R 30]
Lyon	France	Lyon Metro	1978[123]	2013[124]	40[125]	32.0 km (19.9 mi)[125]	198.2 (2016)[R 30]
Marseille	France	Marseille Metro	1977	2010	28[126]	21.5 km (13.4 mi)[126]	75.9 (2016)[R 30]
Paris	France	Paris Métro	1900[127]	2013[128]	302[129]	214 km (133 mi)[127]	1518.6 (2016)[R 30][R Nb 6]
Rennes	France	Rennes Metro	2002	–	15	9.4 km (5.8 mi)	34.3 (2016)[R 30]
Toulouse	France	Toulouse Metro	1993[130]	2007[130][Nb 24]	37[131]	28.2 km (17.5 mi)[130]	110.9 (2016)[R 30]
Tbilisi	Georgia	Tbilisi Metro	1966[132]	2017[133]	23[134]	27.1 km (16.8 mi)[134]	113.8 (2017)[R 3]
Berlin	Germany	Berlin U-Bahn	1902[135]	2009	173[135]	151.7 km (94.3 mi)[136]	563 (2017)[R 31]
Hamburg	Germany	Hamburg U-Bahn	1912[137]	2018[138]	92[139]	106.1 km (65.9 mi)[139]	242.5 (2017)[R 32]
Munich	Germany	Munich U-Bahn	1971[140]	2010[Nb 25]	96[140]	95 km (59 mi)[140]	410 (2017)[R 33]
Nuremberg	Germany	Nuremberg U-Bahn	1972	2017[Nb 26][141]	48[142]	36 km (22 mi)[142]	128.85 (2015)[R 34]
Athens	Greece	Athens Metro[Nb 27]	1904[145][Nb 28]	2013[146]	61[147]	84.7 km (52.6 mi)[143]	264.4 (2015)[R 35][R Nb 7]
Budapest	Hungary	Budapest Metro	1896	2014[148]	48	38.2 km (23.7 mi)[148][149]	410.6 (2017)[R 36]
Bengaluru	India	Namma Metro	2011[150]	2017[151]	40[152]	42.3 km (26.3 mi)[152]	109.2 (2018*)[R 37][R

City	Country	Name	Year opened	Year of last expansion	Stations	System length	Annual Ridership (millions) Nb 8]
Chennai	India	Chennai Metro	2015[153]	2018[154]	26[155]	35.3 km (21.9 mi)[154]	n/a
Delhi	India	Delhi Metro	2002[156]	2018[157]	209[Nb 29]	317 km (197 mi)[158]	1007.9 (2017*)[R 38]
Gurgaon	India	Rapid Metro	2013[160]	2017[161]	11[161]	11.7 km (7.3 mi)[161]	2.3 (2014*)[R 39][R Nb 9]
Hyderabad	India	Hyderabad Metro	2017[162]	2018[162]	40[162]	46.5 km (28.9 mi)[162]	n/a
Jaipur	India	Jaipur Metro	2015[163][164]	–	9[164]	9.6 km (6.0 mi)[164][165]	7.2 (2017*)[R 40]
Kochi	India	Kochi Metro	2017[166]	2017[167]	16[168]	18.4 km (11.4 mi)[168]	n/a
Kolkata	India	Kolkata Metro	1984[169]	2013[169]	24[169]	27.2 km (16.9 mi)[169]	206.1 (2018*)[R 41]
Lucknow	India	Lucknow Metro	2017[170]	–	8[170]	8.5 km (5.3 mi)[170]	n/a
Mumbai	India	Mumbai Metro	2014	–	12[171]	11.4 km (7.1 mi)[171]	100+ (2017/2018)[R 42]
Isfahan	Iran	Isfahan Metro	2015[172]	2018[173][174]	20[173]	20.2 km (12.6 mi)[173]	n/a
Mashhad	Iran	Mashhad Urban Railway	2011[175]	2018[176]	32	34.1 km (21.2 mi)	39.3[citation needed]
Shiraz	Iran	Shiraz Metro	2014[177]	2018[Nb 30]	16[177]	22.4 km (13.9 mi)[177]	n/a
Tabriz	Iran	Tabriz Metro	2015[178]	2017	10	7 km (4.3 mi)	n/a
Tehran	Iran	Tehran Metro[Nb 31]	1999[Nb 32]	2017[179]	116[180]	173 km (107 mi)[180]	717 (2015*)[R 43]
Brescia	Italy	Brescia Metro	2013[181]	–	17[182]	13.7 km (8.5 mi)[182]	17.4 (2017)[R 44]

City	Country	Name	Year opened	Year of last expansion	Stations	System length	Annual Ridership (millions)
Catania	Italy	Catania Metro	1999[183]	2017[184]	10[185]	8.8 km (5.5 mi)	3.4 (2017)[R 45]
Genoa	Italy	Genoa Metro	1990[186]	2012[186]	8[186]	7.1 km (4.4 mi)[186]	11 (2012)[R 46]
Milan	Italy	Milan Metro[187]	1964[187]	2015[187]	106[Nb 33]	101 km (63 mi)[187]	569.5 (2017)[citation needed]
Naples	Italy	Naples Metro[Nb 34]	1993	2013[Nb 35]	22[189]	20.5 km (12.7 mi)[189]	42.5 (2017)[R 47][R Nb 10]
Rome	Italy	Rome Metro	1955	2018[190]	73[191]	60 km (37 mi)[192][193]	279 (2012)[R 48]
Turin	Italy	Turin Metro	2006[194]	2011[194]	21[194]	13.2 km (8.2 mi)[194]	41.1 (2015)[R 49]
Fukuoka	Japan [Nb 36]	Fukuoka City Subway	1981[195]	2005[195]	35[195]	29.8 km (18.5 mi)[195]	165.8 (2017*)[R 50][R Nb 11]
Hiroshima	Japan [Nb 36]	Astram Line	1994[196]	2015[197]	21	18.4 km (11.4 mi)[196]	23.7 (2017*)[R 50][R Nb 11]
Kobe	Japan [Nb 36]	Kobe Municipal Subway	1977[196]	2001	25	30.6 km (19.0 mi)[196]	112.9 (2017*)[R 50][R Nb 11]
Kyoto	Japan [Nb 36]	Kyoto Municipal Subway	1981[196]	2008	31[198]	31.2 km (19.4 mi)[196]	141.4 (2017*)[R 50][R Nb 11]
Nagoya	Japan [Nb 36]	Nagoya Municipal Subway	1957[196]	2011[199]	87[199]	93.3 km (58.0 mi)[199]	479.4 (2017*)[R 50][R Nb 11]
Osaka	Japan [Nb 36]	Osaka Metro	1933[200]	2006[200]	100[201]	129.9 km (80.7 mi)[200][202]	870.4 (2016*)[R 51][R Nb 11]
Sapporo	Japan [Nb 36]	Sapporo Municipal	1971[196]	1999	46[203]	48.0 km (29.8 mi)[19	229.2 (2017*)[

City	Country	Name	Year opened	Year of last expansion	Stations	System length	Annual Ridership (millions)
		Subway				6]	R 50][R Nb 11]
Sendai	Japan [Nb 36]	Sendai Subway	1987[204]	2015[205]	29[204]	28.7 km (17.8 mi)[204]	88.4 (2017*)[R 50][R Nb 11]
		Toei Subway	1960[206]	2002[206]	99[Nb 37]	109.0 km (67.7 mi)[206]	1004.5 (2017*)[R 50][R Nb 11]
Tokyo	Japan [Nb 36]	Tokyo Metro	1927[209]	2008	142[210]	195.1 km (121.2 mi)[211]	2709.1 (2017*)[R 50][R Nb 11]
		Tokyo Monorail	1964	2004	8	17.8 km (11.1 mi)	105.4 (2017*)[212]
		Rinkai Line	1996[196]	2002	8	12.2 km (7.6 mi)[196]	90.7 (2016*)[R 52][R Nb 11]
Yokohama	Japan [Nb 36]	Yokohama Municipal Subway	1972[213]	2008[213]	40[213]	53.4 km (33.2 mi)[213]	239.1 (2017*)[R 50][R Nb 11]
		Minatomirai Line	2004[196]	2008	6	4.1 km (2.5 mi)[196]	76.4 (2017*)[R 50][R Nb 11]
Almaty	Kazakhstan	Almaty Metro	2011[214]	2015[214]	9	11.3 km (7.0 mi)[214]	13.8 (2017)[R 3]
Pyongyang	North Korea	Pyongyang Metro	1973	1987[Nb 38]	17	22 km (14 mi)	36 (2009)[R 53]
Busan	South Korea	Busan Metro	1985	2017[Nb 39]	135	139.9 km (86.9 mi)	358 (2017)[R 54][R Nb 12]
Daegu	South Korea	Daegu Metro	1997	2015[Nb 40]	58[215]	81.2 km (50.5 mi)[215]	163 (2017)[R 54]
Daejeon	South Korea	Daejeon Metro	2006	2007[Nb 41]	22	22.7 km (14.1 mi)	39 (2017)[R 54]
Gwangju	South Korea	Gwangju	2004	2008[Nb	20	20.1 km	19

City	Country	Name	Year opened	Year of last expansion	Stations	System length	Annual Ridership (millions)
	Korea	Metro		42]		(12.5 mi)	(2017)[R 54]
Incheon	South Korea	Incheon Subway	1999	2016	55[216]	29.4 km (18.3 mi)[216]	109 (2017)[R 54]
Seoul	South Korea	Seoul Subway (lines 1-9)[Nb 43][Nb 44]	1974[217]	2018[218]	315[219]	340.4 km (211.5 mi)[219][217]	2836.5 (2017)[R 55][R Nb 13][R Nb 14]
		Korail metro lines[Nb 45][Nb 44]	1994[Nb 46]	2016[220]	81	133 km (83 mi)[221]	415.6 (2017)[R 56][R Nb 15]
		Shinbundang Line[Nb 44] (NeoTrans)	2011	2016[222]	12	31.3 km (19.4 mi)[222]	95.7 (2017)[R 56][R Nb 16]
Kuala Lumpur	Malaysia	Rapid KL[Nb 47]	1996	2017[223]	104	142.5 km (88.5 mi)	182 (2017)[R 57]
Mexico City	Mexico	Mexico City Metro	1969[224]	2012[Nb 48]	163[Nb 49]	226.5 km (140.7 mi)[225]	1605 (2016)[R 58]
Monterrey	Mexico	Monterrey Metro	1991[226]	2008[226]	31[227]	32 km (20 mi)[228]	177.6 (2017)[R 59]
Amsterdam	Netherlands	Amsterdam Metro[Nb 50]	1977	2018[229]	39[230]	41.2 km (25.6 mi)	73.7 (2017)[R 60][R Nb 17]
Rotterdam	Netherlands	Rotterdam Metro[Nb 51]	1968	2010	62	78.3 km (48.7 mi)	93 (2017)[R 61]
Oslo	Norway	Oslo Metro[Nb 52]	1966[Nb 53]	2016[Nb 54]	101	85 km (53 mi)[231]	118 (2017)[R 62]
Panama City	Panama	Panama Metro	2014[232]	2015[232]	14[233]	15.8 km (9.8 mi)[233][234]	81.5 (2017)[R 63]
Lima	Peru	Lima Metro	2011	2014[235]	26	34.6 km (21.5 mi)[235]	107.5 (2017)[R 64]
Manila	Philippines	Manila Light Rail Transit	1984[236]	2010[236]	31[237]	33.4 km (20.8 mi)[236][238]	243.6 (2014)[R 65]

City	Country	Name	Year opened	Year of last expansion	Stations	System length	Annual Ridership (millions)
		System					
		Manila Metro Rail Transit System	1999	2000	13	16.9 km (10.5 mi)[239]	158.8 (2011)[R 66][R Nb 14]
Warsaw	Poland	Warsaw Metro	1995	2015[240]	27	29 km (18 mi)[R 67]	187.3 (2016)[R 67]
Lisbon	Portugal	Lisbon Metro	1959[241]	2016[242]	56[242]	44.1 km (27.4 mi)[242]	161.5 (2017)[R 68]
Bucharest	Romania	Bucharest Metro	1979[243]	2017[243][Nb 55]	47[244]	71.4 km (44.4 mi)[244]	179.1 (2016)[R 69]
Kazan	Russia	Kazan Metro[245]	2005	2018[246]	11[247]	16.8 km (10.4 mi)[247]	27.2 (2017)[R 3]
Moscow	Russia	Moscow Metro[248]	1935	2018	223[249]	381 km (237 mi)[249]	2442.4 (2017)[R 70]
Nizhny Novgorod	Russia	Nizhny Novgorod Metro	1985	2018[250]	15[250]	21.6 km (13.4 mi)[citation needed]	27.6 (2017)[R 3]
Novosibirsk	Russia	Novosibirsk Metro	1986	2010[251]	13[247]	15.9 km (9.9 mi)[247]	80.3 (2017)[R 3]
Saint Petersburg	Russia	Saint Petersburg Metro	1955	2018[252]	69[253]	118.6 km (73.7 mi)[253]	726.5 (2017)[R 3]
Samara	Russia	Samara Metro	1987[254]	2015[255]	10[247]	11.6 km (7.2 mi)[247]	14.1 (2017)[R 3]
Yekaterinburg	Russia	Yekaterinburg Metro	1991	2012[256]	9[247]	12.7 km (7.9 mi)[247]	49.3 (2017)[R 3]
Mecca	Saudi Arabia	Al Mashaaer Al Mugaddassah Metro Southern Line	2010	–	9	18.1 km (11.2 mi)	4 (2011)[R 71][R Nb 18]
Singapore	Singapore	Mass Rapid Transit	1987	2017[257]	119[258]	198.6 km (123.4 mi)[258]	1139.5 (2017)[R 72]

City	Country	Name	Year opened	Year of last expansion	Stations	System length	Annual Ridership (millions)
Barcelona	Spain	Barcelona Metro[Nb 56]	1924	2018[259]	131[260]	120.7 km (75.0 mi)[260]	390.4 (2017)[R 73][R 74]
Bilbao	Spain	Metro Bilbao[Nb 57]	1995[261]	2014[262]	41[263]	45.1 km (28.0 mi)[263]	88.2 (2017)[R 75]
Madrid	Spain	Madrid Metro[Nb 58]	1919[264]	2015[265]	241[266]	288.5 km (179.3 mi)[266]	626.4 (2017)[R 73][R 76]
Stockholm	Sweden	Stockholm Metro	1950	1994[Nb 59]	100[267]	108 km (67 mi)[267]	353 (2017)[R 77]
Lausanne	Switzerland	Lausanne Metro[Nb 60]	2008	2008	14	5.9 km (3.7 mi)	30.1 (2017)[R 78][R Nb 19]
Kaohsiung	Taiwan	Kaohsiung Mass Rapid Transit	2008	2012	37[268]	42.7 km (26.5 mi)[268]	63.8 (2017)[R 79]
Taipei	Taiwan	Taipei Metro	1996[269]	2015[270]	108[271][Nb 61]	131.1 km (81.5 mi)[271]	746.1 (2017)[R 80]
Taoyuan	Taiwan	Taoyuan Metro	2017	–	22[272]	53.1 km (33.0 mi)	n/a
Bangkok	Thailand	BTS Skytrain	1999[273]	2018[273]	43[273]	51.3 km (31.9 mi)[273]	241.1 (2017)[R 81]
		Metropolitan Rapid Transit	2004	2017[274]	34[275]	44 km (27 mi)[276]	107.8 (2017)[R 82][R Nb 20]
Adana	Turkey	Adana Metro	2009	2010	13[277]	13.9 km (8.6 mi)[277]	14 (2011)[R 83]
Ankara	Turkey	Ankara Metro	1997	2017[278][Nb 62]	56[279]	64.36 km (39.99 mi)[278][279]	131 (2017)[R 84]
Bursa	Turkey	Bursaray	2002	2014[Nb 63]	38[280]	38.9 km (24.2 mi)[280]	91.3 (2010)[R 85]
Istanbul	Turkey	Istanbul Metro[Nb 64]	1989[281]	2018[282][Nb 65]	89	115.3 km (71.6 mi)[281]	384.9 (2015)[R 86]
İzmir	Turke	İzmir	2000	2014[283	17[283]	20 km	105

City	Country	Name	Year opened	Year of last expansion	Stations	System length	Annual Ridership (millions)
	y	Metro		][Nb 66]		(12 mi)[283]	(2016)[R 87]
Dnipro	Ukraine	Dnipro Metro	1995	–	6[284]	7.1 km (4.4 mi)[284]	7.5 (2017)[R 3]
Kharkiv	Ukraine	Kharkiv Metro	1975	2016	30[284]	38.1 km (23.7 mi)[284]	212.9 (2017)[R 88]
Kiev	Ukraine	Kiev Metro	1960	2013	52[284]	67.6 km (42.0 mi)[284]	498.5 (2017)[R 3]
Dubai	United Arab Emirates	Dubai Metro	2009[285]	2014[Nb 67]	47[285]	74.6 km (46.4 mi)[285]	200.1 (2017)[R 89]
Glasgow	United Kingdom	Glasgow Subway	1896[286]	–	15[286]	10.4 km (6.5 mi)[286]	11.4 (2016*)[R 90]
London	United Kingdom	London Underground[287]	1890[2][Nb 68]	2008[2]	270[288]	402 km (250 mi)[288]	1378 (2016*)[R 91][R Nb 21]
		Docklands Light Railway	1987[289]	2011[289]	45[289]	34 km (21 mi)	122.3 (2016*)[R 91]
Newcastle	United Kingdom	Tyne and Wear Metro[Nb 52]	1980[290]	2008[291]	60[290]	77.5 km (48.2 mi)[292]	37.7 (2016*)[R 92]
Atlanta	United States	MARTA	1979[293]	2000[293]	38[294]	76.6 km (47.6 mi)[294]	67.4 (2017)[R 14][R Nb 1]
Baltimore	United States	Baltimore Metro Subway	1983	1995	14[295]	24.9 km (15.5 mi)[295]	10.8 (2017)[R 14][R Nb 1]
Boston	United States	MBTA Subway[Nb 69]	1901[296][Nb 70]	2014[297]	51[298]	61 km (38 mi)[298]	167.2 (2017)[R 14][R Nb 1]
Chicago	United States	Chicago "L"	1897[299][Nb 71]	2015[300][Nb 72]	145[301]	165.4 km (102.8 mi)[301][Nb 73]	230.2 (2017)[R 14][R Nb 1]
Cleveland	United States	RTA Rapid Transit:	1955[302]	1968[302]	18[303]	31 km (19 mi)[303]	5.9 (2017)[R

City	Country	Name	Year opened	Year of last expansion	Stations	System length	Annual Ridership (millions)
		Red Line					14][R Nb 1]
Los Angeles	United States	Metro Rail[Nb 74]	1993[304]	2000[304][Nb 75]	16[304][Nb 74]	28.0 km (17.4 mi)[304]	44.9 (2017)[R 14][R Nb 1][R Nb 22]
Miami	United States	Metrorail	1984[305]	2012	23[306]	40.1 km (24.9 mi)[306]	19.7 (2017)[R 14][R Nb 1]
New York City	United States	New York City Subway	1904[307][Nb 76]	2017[308]	7002424000000000000♠424[Nb 77]	380.2 km (236.2 mi)[309]	1727.3 (2017)[R 93]
		Staten Island Railway	1925[Nb 78]	2017[310]	21[307][311]	22.5 km (14.0 mi)[309]	8.8 (2017)[R 14][R Nb 1]
		PATH	1908[312]	1911[Nb 79]	13[313]	22.2 km (13.8 mi)[314]	93.0 (2017)[R 14][R Nb 1]
Philadelphia	United States	SEPTA[315][Nb 80]	1907	1973	75[315]	59.1 km (36.7 mi)[316][317]	91.8 (2017)[R 14][R Nb 1]
		PATCO Speedline	1936[318][Nb 81]	1969	13[318]	22.9 km (14.2 mi)[318]	10.8 (2017)[R 14][R Nb 1]
San Francisco	United States	BART[Nb 82]	1972[319]	2017[320]	45[319][Nb 83]	174.8 km (108.6 mi)[319][Nb 84]	129.3 (2017)[R 14][R Nb 1]
San Juan, Puerto Rico	United States	Tren Urbano	2004	2005	16	17.2 km (10.7 mi)	4.8 (2017)[R 14][R Nb 1][R Nb 23]
Washington, D.C.	United States	Washington Metro	1976[321]	2014[322]	91[321]	188 km (117 mi)[321]	229.6 (2017)[R 14][R Nb 1]
Tashkent	Uzbekistan	Tashkent Metro	1977	2001[Nb 85]	29[284]	36.2 km (22.5 mi)[284]	61.6 (2017)[R 3]

City	Country	Name	Year opened	Year of last expansion	Stations	System length	Annual Ridership (millions)
Caracas	Venezuela	Caracas Metro,[Nb 86] Los Teques Metro	1983[323]	2015[Nb 87]	49[324]	63.6 km (39.5 mi)[323]	358 (2017)[R 94][R 95]

Table notes
^* Indicates ridership figures based on the fiscal year rather than the calendar year.
Under construction[edit]
The following is a list of new worldwide metro systems that are currently actively under construction. Note that in some cases it is not clear if the system will be considered a full metro system once it begins operational service.

Location	Country	Name	Start of construction	Planned opening
Sydney	Australia	Sydney Metro[UC 1][UC 2][UC 3]	2014[UC 2][UC 4]	2019[UC 2][UC 3][UC 5][UC 6]
Dhaka	Bangladesh	Dhaka Metro	2016[UC 7]	2021[UC 8]
Montreal	Canada	Réseau express métropolitain	2018[UC 9]	2021[UC 10]
Changzhou	China	Changzhou Metro[UC 11]	2014[UC 11]	2019[UC 11]
Hohhot	China	Hohhot Metro [zh][UC 12]	2015	2020[UC 12]
Jinan	China	Jinan Metro	2013	2019[UC 13]
Jinhua	China	Jinhua Metro [zh][UC 14]	2016[UC 14]	2020[UC 14]
Lanzhou	China	Lanzhou Metro[UC 15]	2014[UC 15]	June 2019[UC 16]
Luoyang	China	Luoyang Metro[UC 17]	2016[UC 17]	2020[UC 17]
Macau	China	Macau Light Rapid Transit[UC 18]	2012[UC 18]	2019[UC 18]
Nantong	China	Nantong Metro	2017[UC 19]	2022
Shaoxing	China	Shaoxing Metro [zh]	2017[UC 20]	2021
Taiyuan	China	Taiyuan Metro[UC 21]	2013[UC 21]	2020[UC 21]
Xuzhou	China	Xuzhou Metro[UC 22][UC 23]	2014[UC 22]	2019
Wenzhou	China	Wenzhou Metro	2013[UC 24]	2018[UC 25]
Wuhu	China	Wuhu Metro[UC 24]	2017	2019[UC 24]
Quito	Ecuador	Quito Metro[UC 26]	2012[UC 26][UC 27]	2019[UC 28]
Thessaloniki	Greece	Thessaloniki Metro	2006[UC 29]	2020[UC 30]
Gandhinagar Ahmedabad	India	Metro-Link Express for Gandhinagar and Ahmedabad	2015[UC 31]	2020[UC 32]
Pune	India	Pune Metro	2017	2021[UC 33]

Location	Country	Name	Start of construction	Planned opening
Navi Mumbai	India	Navi Mumbai Metro[UC 34]	2011	2019[UC 34]
Nagpur	India	Nagpur Metro[UC 35]	2015[UC 35]	2019
Noida	India	Noida Metro[UC 36]	2015[UC 36]	December 2018[UC 37]
Jakarta	Indonesia	Jakarta Mass Rapid Transit[UC 38][UC 39]	2013[UC 38][UC 39]	March 2019[UC 40]
Ahvaz	Iran	Ahvaz Metro	2004	2019?[UC 41]
Karaj	Iran	Karaj Metro [fa]	2006[UC 42]	2019?
Kermanshah	Iran	Kermanshah Metro [fa]	2011	2022[UC 43]
Qom	Iran	Qom Metro[UC 44]	2009	2019[citation needed]
Abidjan	Ivory Coast	Abidjan Metro	2017	2022/2023[citation needed]
Lagos	Nigeria	Lagos Rail Mass Transit	2009	2022[UC 45]
Lahore	Pakistan	Lahore Metro	2015[UC 46]	March 2019[UC 47]
Doha	Qatar	Doha Metro[UC 48]	2012[UC 48]	2019[UC 48]
Chelyabinsk	Russia	Chelyabinsk Metro[UC 49]	1992	unknown (after 2025)[UC 50]
Riyadh	Saudi Arabia	Riyadh Metro[UC 51]	2014[UC 51]	2019[UC 51]
Taichung	Taiwan	Taichung Mass Rail Transit System[UC 52][UC 53]	2009[UC 52]	2020[UC 54]
Honolulu	United States	Honolulu Rail Transit	2012	2020
Hanoi	Vietnam	Hanoi Metro[UC 55][UC 56]	2010[UC 55]	2019
Ho Chi Minh City	Vietnam	Ho Chi Minh City Metro[UC 57][UC 56]	2010[UC 57]	2020[UC 57]

See also[edit]

List of airport people mover systems
List of bus rapid transit systems
List of driverless trains
List of funicular railways
List of monorail systems
Medium-capacity rail transport system
List of premetro systems
List of suburban and commuter rail systems
List of rapid transit systems by track gauge
List of tram and light rail transit systems
List of town tramway systems
List of trolleybus systems
List of North American light rail systems by ridership
List of North American rapid transit systems
List of United States light rail systems by ridership
List of rail transit systems in the United States
List of United States rapid transit systems
List of Latin American rail transit systems

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METRO 15, January 2019

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PART I: ACTIVITIES FOR URBAN MOBILITY SOLUTIONS IN INDIA

Integrated Water Transport System, Kochi; India

KMRL is all set to implement the integrated water transport project at a cost of Rs.747 crore with financial assistance from the German Bank, KfW. Kochi is the first city in the country to have achieved such a milestone whereby water transport has been integrated as a feeder service to the metro. It is also for the first time in India that such a significant level of investment is being brought in for improving water transport.

The project envisages the development of 16 identified routes, connecting 10 islands along a network of routes that span 76km. The project intends to bring in a fleet of 78 fast, fuel efficient, air-conditioned ferries plying to 38 jetties, 18 of which will be developed as main boat hubs, while the remaining 20 will be minor jetties for transit services. More than 100,000 islanders are expected to benefit from the Water Metro, complete with modern watercrafts.

Mumbai revives Sea Transport Plan for daily Commuters

Proposal to ferry commuters from Nariman Point to Borivali could not take off despite tenders being issued twice in the past.

By Ashwin Aghor

Last Updated: Saturday 04 July 2015

Mumbai's much-hyped and talked about water transport project that proposes to link locations along the city's western water front has been revived after three decades. The Maharashtra State Road Development Corporation (MSRDC) has invited tenders to appoint consultant for the project called the Western Corridor, connecting Nariman Point with Borival.

Jaidatta Kshirsagar, minister in charge of public works and chairperson of MSRDC, says work on the project will start soon. MSRDC will construct jetties at various strategic locations along the marine route from Nariman Point to Borivali. "Ferry operators would be roped in to use the jetties," he adds.

The government will develop the infrastructure required for the project like jetties and passenger facilities. "The total cost of the infrastructure required from Nariman Point to Borivali is estimated to be around Rs 1,000crore. We are working out technical and financial details," Kshirsagar says. The consultant is likely to be appointed by December this year. The major stops along the corridor would be Bandra, Juhu, Versova and Marve. The water transport project for the city could not take off earlier because of various hurdles, despite tenders being issued twice over past seven years and numerous studies on the project's feasibility. A group of experts from the state government conducted the first study titled Development of Waterways around Bombay Harbour for Community Traffic, for the project in 1983. In 1995, the City and Industrial Development Corporation (CIDCO), the state-owned infrastructure company, commissioned a study on the technical aspects of the project by Kirloskar Consultants and Consulting Engineering Services (CES) in 1995.

Eastern Corridor Hurdle

Though MSRDC has initiated the process to build the Western Corridor project, the Eastern Corridor, connecting Navi Mumbai with Gate Way of India, still remains a distant dream because MSRDC has asked the state government for a site near Colaba in south Mumbai to build a jetty, instead of Ferry Wharf or Jamshed Bunder in the east coast. These sites are further away (10 km by road) from the main office complexes in Fort area, Colaba and Nariman point.

"Jetties at Ferry Wharf and Jamshed Bunder won't be convenient for the majority of passengers as they will have to take a bus to Colaba and Nariman Point from there. If the government allots a site in Colaba-Nariman Point stretch for a jetty, it will be beneficial for both ferry operators as well as passengers. Thousands of commuters from Navi Mumbai will prefer water transport if the jetty is constructed in the Colaba-Nariman Point area," says a senior MSRDC official. The corporation officials are optimistic that state government will identify the desired spot near Colaba-Nariman Point soon.

A hovercraft service was operational between Navi Mumbai and the Gateway of India for a short span of time in 1992-93, but it was discontinued because of several problems. "We are waiting for the government to make a positive move so that we can begin planning a service from Navi Mumbai to Colaba," says the official. As Gateway of India is quite crowded, the state government wants to start the services on the eastern front from Ferry Wharf. "The train services on the harbour corridor are overburdened. So it has become necessary to think of an alternative—the catamaran services, which are faster than normal ferry boats. Besides, enough Navi Mumbai residents can afford catamarans,'' says a senior official of MSRDC.

The proposal would involve constructing jetties, providing vessels and ensuring safe transport. The time frame of the project will be decided by the government. These vessels won't be used during the monsoon.

According to sources, the Mumbai Metropolitan Region Development Authority (MMRDA) will be entrusted with the task of developing the eastern corridor of water transport as Maharashtra Maritime Board (MMB) and MSRDC have not done anything in this regard. In the first phase, MMRDA will develop water transport connecting Nerul in Navi Mumbai and Ferry Wharf in Mumbai. The matter will soon be put before the state cabinet for final approval, sources in MSRDC say.

There was a catamaran service from Vashi and Belapur in Navi Mumabi to Gate Way of India about a decade ago. The services were closed down later and MMB was assigned the task to create routes on western and eastern water corridor. When MMB did not act on it, MSRDC was roped in though it lacked experience in water transport.

PART II: ACTIVITIES FOR URBAN MOBILITY SOLUTIONS INTERNATIONAL

Construction begins on Suzhou – Shanghai Inter-City Metro Line "*METRO-TRAIN*"; China

Dec. 24, 2018

Written by Keith Barrow

CONSTRUCTION has begun on a new metro line in Suzhou, which will connect the city's urban rail network with the system in neighboring Shanghai.

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The 41.3 km Line S1, which is part of the third phase of the Suzhou metro network, will run east from Yiting Road station in Suzhou Industrial Park to Kunshan City and Kunshan Huaqiao, which has been served by Shanghai metro Line 11 since October 2013.

Services on the 28-station line will be operated by a fleet of six-car Type B **Metro Trains**, which will operate at up to 100 km/h.

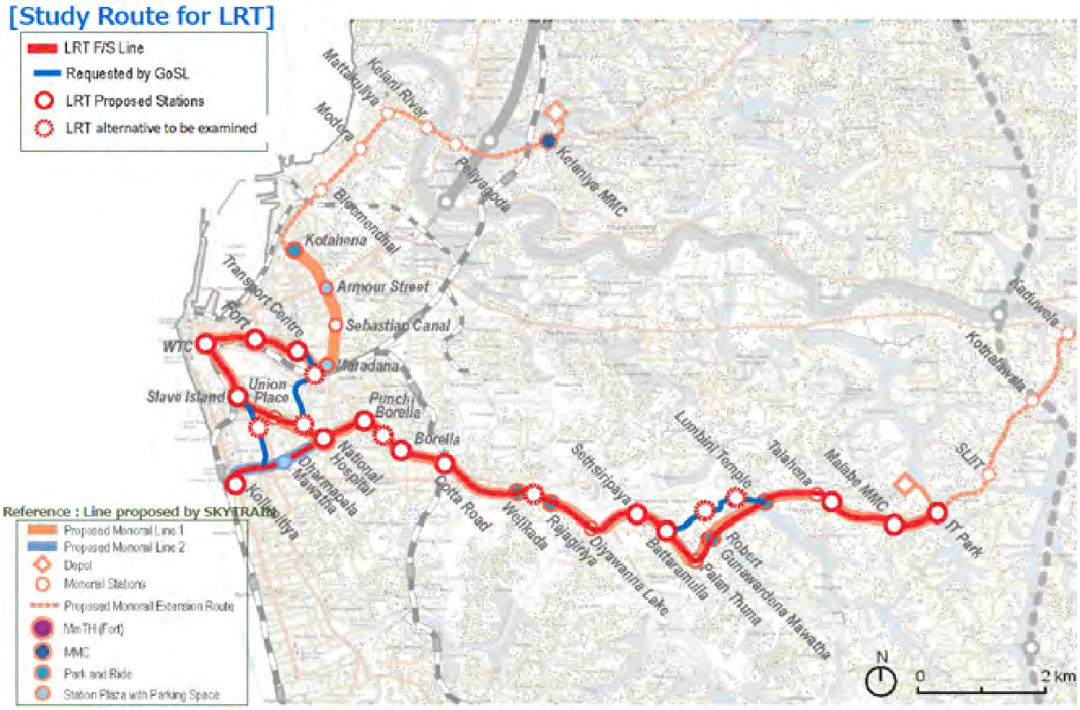
Trial passenger services are expected to begin in December 2023.

Shanghai Shentong Metro Group announced in November that it has signed a partnership agreement with metro operators in Hangzhou and Ningbo which enable users of the Shanghai Metro app to travel on metro networks in other cities in the Yangtze River Delta.

Categories: AsiaMetros

JICA kicks off Study for Colombo-Malabe elevated LRT; Sri Lanka

Author LBO
Posted on March 3, 2017 | Banking and Finance, Featured, Shipping and Transport



Mar 03, 2017 (LBO) – Sri Lanka office of the Japan International Cooperation Agency (JICA) has commenced the preparatory study for the first elevated Light Rail Transit (LRT) line in Sri Lanka between Colombo and Malabe.

JICA said in a statement, the study will address key aspects such as current and projected traffic patterns, environmental and social impacts, economic viability, financial implications, optimization of the route, inter-modal connectivity, implementation schedules and operation and maintenance systems.

The approximately 25km route which would be covered by the study runs through Malabe – Battaramulla – Rajagiriya – Borella – Union Place – Kollupitiya and Fort.

“As much detailed study has been conducted on this route by JICA during the feasibility study for monorail it would be possible to shorten the period of the new study by using the same data to the extent possible,” JICA said.

“The final optimum route would be determined with special focus on environmental and social considerations, and inter-connectivity with other public transport modes.”

Malabe to Fort is a high priority transport corridor which connects the administrative capital to the business district in metro Colombo.

The CoMTrans (Urban Transport Master Plan for Colombo Metropolitan Region & Suburbs) Master Plan study conducted with JICA assistance in 2012 – 2014 has found that this corridor carries the largest number of vehicles and has the lowest speed compared to all other corridors.

It is also the one major corridor currently not served by a rail based public transport mode. The monorail study found this route economically viable if some of the private vehicle users would shift to public transport during the rush hours.

“The various Government agencies which are responsible for different aspects of land transport would need to coordinate and work towards prioritizing public transport to transform Colombo into a more advanced city," Chief Representative of JICA Sri Lanka Office, Kiyoshi Amada said.

"We hope the Government of Sri Lanka will maintain such policy consistency which would be crucial to provide equitable, efficient, environmentally sustainable and safe mode of transport to all citizens."

As evidenced by dynamic cities around the world, improvement and increased usage of public transport systems is the effective and sustainable solution to urban traffic congestion.

JICA expects the study will set a strong foundation to realize this flagship project which will bring economic and social benefits to the entire country.

Intermodal Hub for Highway-Bus, City Road Bus and Rail MRT at Kotawe, Colombo, Sri Lanka

Line 15, Monorail, Sao Paulo, Brazil

Line 15 São Paulo Metro Monorail; Brazil

Line 15 (Silver) is a line of the São Paulo Metro. It is the first system in the world to use the Bombardier Innovia Monorail 300 and is South America's first mass-transit monorail. When completed it will be the largest and highest capacity monorail system in the Americas and second worldwide only to the Chongqing Monorail.[1] The first section, from Vila Prudente to Oratório, opened on 30 August 2014, initially running 10 AM–3 PM on weekends only.[2] As of 26 October 2016[update], the line is operational from 4:40 AM–12 AM.[3] The line has a free connection to Line 2-Green on Vila Prudente station and future connection to CPTM Line 10-Turquoise on Ipiranga station.[4]
Built using completely driver-less technology,[5] the line is currently 7.6 km (4.7 mi) long and has six stations in the stretch between Vila Prudente and Vila União. When complete, it will be approximately 27 kilometres (17 mi) long and have eighteen stations, beginning at Ipiranga and ending at the future Hospital Cidade Tiradentes. The proposed completion of the full line is projected to be 2021.[6]

Line 15 (São Paulo Metro) [show article only]
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São Paulo Metro Line 15 (Silver)

Overview	
Type	Monorail
System	São Paulo Metro
Status	Partially in operation, Partially under construction
Locale	São Paulo, Brazil
Termini	Ipiranga Hospital Cidade Tiradentes
Stations	6 (operational) 18 (planned)
Operation	
Opened	30 August 2014 (between Vila Prudente and Oratorio) 6 April 2018 (between Vila Prudente and Vila União)
Operator(s)	Companhia do Metropolitano de São Paulo
Character	Elevated
Technical	
Line length	7.6 km (4.7 mi) (operational) 27 km (17 mi) (planned)
Track gauge	None (monorail)
Route map	

[show]
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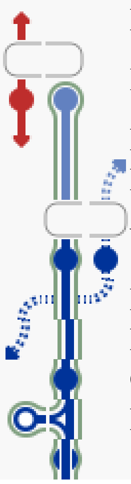
Line 15 (São Paulo Metro)

Legend



Line 10 to Brás

Ipiranga 10

Line 10 to Rio Grande da Serra
Line 2 to Dutra

Vila Prudente 2

Elevated over Line 2
Line 2 to Vila Madalena
Oratório
Link to Oratório rail yard

open

9am – 4pm
São Lucas
5 kilometres (3.1 mi)
open
9am – 4pm
Camilo Haddad
open
9am – 4pm
Vila Tolstói
open
9am – 4pm
Vila União
Under construction
Jardim Planalto
Sapopemba
Fazenda da Juta
São Mateus
Planned
Jardim Colonial
Jequiriçá
Jacu-Pêssego
Link to Raguel Choffi rail yard
Érico Semer
Márcio Beck
Cidade Tiradentes
Hospital Cidade Tiradentes

.
December 2009: Construction initiated
30 August 2014: Vila Prudente-Oratório (2.9 km or 1.8 mi), operating Saturdays and Sundays only, from 10AM to 3PM
20 December 2014: Vila Prudente-Oratório (2.9 km), operating every day from 9AM to 2PM
10 August 2015: Vila Prudente-Oratório, operating every day from 7AM to 7PM
26 October 2016: Vila Prudente-Oratório, operating every day from 4:40AM to 12AM
6 April 2018: São Lucas-Vila União, operating Mondays to Fridays from 10AM to 3PM
Stations[edit]

Code	Station	Platforms	Position	Connections	District
VPM	Vila Prudente	Island platforms	Elevated	Line 2-Green and Urban Bus Terminal	Vila Prudente
ORT	Oratório	Island platforms	Elevated	-	São Lucas

SLU	São Lucas	Island platforms	Elevated -	São Lucas
CAD	Camilo Haddad	Island platforms	Elevated -	São Lucas
VTL	Vila Tolstói	Island platforms	Elevated -	São Lucas/Sapopemba
VUN	Vila União	Island platforms	Elevated -	Sapopemba

LINE 15 SÃO PAULO

Sao Paulo Monorail System with Depot, Brazil

- 
- Monorail Vila Prudentes – Tiradentes São Paulo, Brazil

São Paulo is the capital of the state of São Paulo and the largest city in Brazil. With a population of 11 million people in the municipality of São Paulo and 19.6 million people in the metropolitan area, São Paulo is located 760 meters (231.7 ft) above sea level, has a very mild temperature year around, and a good supply of water. Its municipal area of 1.523-km^2 (588 mi^2) and metropolitan area of 7,943-km^2 (3,066.9 mi^2), are very densely inhabited with 7,216 inhabitants per km^2 (18,688 per mi^2)in the municipality and 2,470 inhabitants per km^2 (6,397 per mi^2) in the metropolitan area.

In 2009, São Paulo Metro decided to implement a monorail solution for the extension of Linha 2 Verde, west to east, between Vila Prudente and Hospital Cidade Tiradentes. The 24-km (14.9 mi)-long line has 17 stations, two maintenance facilities, and numerous switches for the operation of the trains. The project is delivered through a variety of mechanisms. The 2.9-km (1.8 mi) first phase is under construction, and comprises two stations and one maintenance facility being built by Construtora Queiroz Galvão. Once construction began on this section, São Paulo Metro held a Design-Build competition for the project's remaining 10-km (6.2 mi), with eight additional stations leading to Station São Mateus and an11.6-km (7.2 mi) extension to Cidade Tiradentes. The winner of this Design-Build competition was Consórcio Expresso Monotrilho Leste (CEML), a consortium formed by the civil constructors Queiroz Galvão and OAS, and the train provider Bombardier Transportation. Numerous consultants are providing the civil design: Planservi, Proenge, Zamarion, and Millens Consultants. Innova Technologies is the international monorail consultant, delivering overall civil-system coordination and the design and shop drawings for all guideway beams and emergency walkways in the project.

The project is scheduled to commence operation when construction finalizes in the first phase to Oratorio Station; Sao Mateus will be completed by 2014. The extension to Cidade Tiradentes is scheduled to conclude by the end of 2016. To lower capital expenditures, there are four stations in the Sao Mateus-Cidade Tiradente section slated for construction once the project starts operation.

Transportation Engineering, Monorails

World`s first Monorail System ALWEG/HLB, Cologne in the 1960-ties on Test-Run

Teheran Metro System, Iran

Tehran, the capital of Iran, started construction of a metro system already during the reign of the Shah, but due to financing problems the first mass transit line could not open until March 1999. This was the suburban line (shown on maps as Line 5) which links Tehran to the satellite town of Mehrshahr, some 40 km west of Tehran. Meanwhile construction of the first two metro lines also had advanced and the first stretch of **Line 2**, which links the Tehran terminus of the Mehrshahr Line to the city centre at *Imam Khomeini*, started regular service in February 2000. Since then, the network has been gradually expanded by adding more urban lines:

Water Metro; International

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Integrated Water Transport System, Kochi; India

KMRL is all set to implement the integrated water transport project at a cost of Rs.747 crore with financial assistance from the German Bank, KfW. Kochi is the first city in the country to have achieved such a milestone whereby water transport has been integrated as a feeder service to the metro. It is also for the first time in India that such a significant level of investment is being brought in for improving water transport.

The project envisages the development of 16 identified routes, connecting 10 islands along a network of routes that span 76km. The project intends to bring in a fleet of 78 fast, fuel efficient, air-conditioned ferries plying to 38 jetties, 18 of which will be developed as main boat hubs, while the remaining 20 will be minor jetties for transit services. More than 100,000 islanders are expected to benefit from the Water Metro, complete with modern watercrafts.

A new Project Hopes to revive Transport via Waterways in Southwest Asia

World Bank

Bangladesh and neighboring countries suffer from overworked road systems, traffic, and pollution. But with support from the World Bank, a major overhaul of rivers, ports and canals is underway to make water transport a better, and greener, option.

Cotai Water Jet enhances Airport and wifi Services; Hong Kong

5 Jan 2017 by Craig Bright

Hong Kong-Macau ferry operator Cotai Water Jet has begun its new 2017 Promotional Campaign, aimed at facilitating travel between Hong Kong, Macau and Hong Kong International Airport (HKIA).

Travellers between the two Special Administrative Regions will now be able to make use of a suite of enhanced offerings. Among these is a new open check-in option for passengers who purchase Cotai Water Jet air-to-sea tickets, allowing them to board any sailing between Macau and HKIA.

Meanwhile, Cotai First passengers who are unable to make their pre-booked ferry voyage due to a delayed flight arrival can now board any other sailing on the same day as the original ticket.

The ferry operator is also giving away a HK$50/MOP50 (US$6.4) cash coupon for passengers' next travel on City or Airport ferry routes when they purchase a full fare Cotai Water Jet Airport route ticket. The offer runs until the end of 2017.

In addition to enhancing its airport services, the ferry operator has also expanded its on-board wifi offering, which now includes passengers travelling in Cotai Class alongside existing premium services for first class travellers. Wifi connectivity in both classes is now available in more than half of the operator's vessels, with all ferries expected to offer connectivity in both classes by March.

Cotai Water Jet's ferry services run every 30 minutes from 7am to 11:30pm daily.

cotaiwaterjet.com

Tags: Cotai Water Jet, Hong Kong, Hong Kong International Airport, Macau

Thai Prime Minister opens Bangkok Skytrain Extension; Thailand

Dec. 7, 2018

Written by Keith Barrow

THAILAND's prime minister Mr Prayut Chan-o-cha inaugurated the 12.8km southern extension of the Bangkok Skytrain Sukhumvit Line (Green Line) from Samrong to Kheha in Samut Prakan on December 6.

London Overground Extension Construction Contract awarded; UK

Dec. 24, 2018

Written by Kevin Smith

TRANSPORT for London (TfL) has selected a joint venture of Morgan Sindall and VolkerFitzpatrick to construct a 4.5km extension of the London Overground Gospel Oak – Barking line to a new station at Barking Riverside.

The new Station at Barking Riverside

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Nov 28, 2018 | [Commuter Rail]

The contract is worth £196m and includes modifications to tracks at Barking station and on an existing 3km section of Network Rail’s Barking – Tilbury line. The contractors will also build a new 1.5km double-track viaduct from Renwick Road overbridge to the new terminus station.

The new station will serve a 10,000-home development with the developers Barking Riverside meeting £172m of the cost of the scheme. Preliminary work is already complete and main construction will start in May.

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Travel on the eight station extension will be free-of-charge until April, when the initial section of the 18.4km Mo Chit – Khu Kot extension is due to open.

The journey time from Samrong to Kheha is 13 minutes.

Siemens and Turkish partner Bozankaya are supplying 22 four-car trains for the extension of the Sukhumvit Line under a contract awarded in May 2016. Siemens will be responsible for maintaining the fleet for 16 years and a new depot has been built on the extension at Muang in Samut Prakan.

For detailed data on urban rail projects around the globe, subscribe to IRJ Pro.

Categories: AsiaMetros

Shanghai Songjiang Tramway opens; China

Dec. 26, 2018

Written by Keith Barrow

PUBLIC services began operating on the first phase of the Shanghai Songjiang Tramway network on December 26 with the start of operations on the section of Line T2 from Canghua Road to Zhongchen Road.

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Contracts awarded for Parramatta Light Rail
Dec 20, 2018 | Light Rail
Oklahoma City Streetcar opens
Dec 17, 2018 | News

The 13.9 km line serves 20 stations, including an interchange with Shanghai metro Line 9 at Songjiang University Town, with a journey time of 46 minutes between the termini. Trams are initially operating at 10-15 minutes headways.
The line will be operated and maintained by a joint venture of Shanghai Shentong Metro Group (51%) and Keolis' Chinese joint venture, Shanghai Keolis (49%), under a five-year contract awarded earlier this year.

In April 2015, Shanghai Songjiang Tramway Investment and Operation Company awarded a joint venture of Alstom and Shanghai Rail Traffic Equipment Development Company (Satco) a €72m contract to supply 30 Silkworm low-floor LRVs, which are the first in China to be based on Alstom's Citadis platform.

The five-section bidirectional vehicles are 33m long and 2.65m wide and accommodate up to 300 passengers including 56 seated

.Line T1 from Chenta Road to Xinqiao main line station is due to open next year. Line T2 will become a circular line when the link between Zhongchen Road and Jinxi Road is completed, sharing Line T1 tracks between Jinxi Road and North Sanxin Road.

Shanghai Songjiang Tramway operating contract awarded

Categories: AsiaLight Rail
Tags: AlstomChinaKeolisShanghai

The King's Cross Fire; UK

On 18 November 1987, the worst fire in the history of the London Underground began when a match was dropped on the escalators...
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What did it change?

The King's Cross fire claimed the lives of 31 people – including a senior ranked firefighter – and seriously injured many more at King's Cross station.

A public inquiry by Sir Desmond Fennell published in November 1988, made 157 recommendations including:

- Replacing wooden escalators.
- The smoking ban extended to all station areas.
- Radio equipment used by British Transport Police to be compatible with those of the Brigade.
- A review of the Brigade's Personal Protective Equipment (PPE).
- Improvement to the Brigade's radio communications between firefighters below ground.
- Plans to be kept outside stations in locations agreed with the Brigade.
- Review of training and policy.

How did the King's Cross fire begin?

More than 150 firefighters and 30 fire engines were called to a blaze at King's Cross station at on the evening of 18 November 1987.

The blaze, which is thought to have started around 7:25pm, when a lit match fell through a gap on a wooden escalator and set fire to the grease and litter beneath the steps.

Although small to begin with, described by one firefighter as "about the size of a large cardboard box", it became more serious quickly. The flames heated the framework and decking of the Piccadilly line escalator, pre-heating the rest of the wooden staircase before bursting into flames.

ITN footage of the King's Cross fire

What happened?

Investigators labelled this behaviour of the flames lying down in the escalator the 'trench effect'.

Many passengers escaped using an alternative escalator and all trains had been instructed not to stop at the station, however, the ticket hall was still busy with the last of the evening's rush hour crowd when the fireball erupted from the stairwell.

The time shown by the clock at the top of the escalator read 7:45pm – the exact moment when the flames burnt through its wiring.

What was it like on the scene?

A large ball of flame, which was about head height, hit the ceiling in the ticket hall…this was followed almost instantaneously by dense black smoke.

PC Stephen Hanson, British Transport Police officer – speaking at the subsequent inquiry

Hot enough to strip tiles from the walls

The blaze cracked concrete, stripped tiles from the walls and caused molten plastic to drip from the ceiling. The thick smoke engulfed the ticket hall, obscuring the exits and hampering rescue efforts.

The heat from the fire was so intense that firefighters tackling the blaze had to use their hoses to spray the backs of colleagues in a bid to keep the temperature bearable for brief period.

The fire was under control at 9:48pm and was out at 01:46am on 19 November. Search and salvage operations continued throughout the night.

A heroic act

Among those caught up in the fireball was Soho's Station Officer Colin Townsley, who had entered the underground with a colleague, Temporary Sub-Officer Roger Bell, of Clerkenwell Fire Station, to assess the situation.

Crews found the body of Station Officer Townsley beside the badly burned body of a passenger at the steps leading up to the Pancras Road entrance of the station.

Witnesses recalled seeing a firefighter wearing a white helmet just before the flashover telling passengers to get out.

Sir Desmond Fennell's report said all the evidence suggested...

Station Officer Townsley was overcome by smoke and fumes while trying to help the burned passenger … a heroic act.

Footage of Colin Townsley's funeral.

Celebrating a brave man

Watch Thames News Footage of the funeral. Hundreds of firefighters and members of the public paid tribute to fallen comrade Colin Townsley who died in the disaster.

Never forgotten

At Soho Fire Station, Station Officer Colin Townsley's space remains empty in memory of the fallen firefighter – and the members of the public who lost their lives that terrible day.

However, this tragic fire has redefined policy on public transport, and led to changes that keep us all much safer today.

METRO

Evolution of public Transport in urban and suburban metropolitan Area

A short History of World Metro Systems – in Pictures

Composed by F. A. Wingler, revised March 2019

Evolution of public Transport in urban and suburban Metropolitan Area

FROM THE FIRST CITY STEAM UNDERGROUND RAIL-WAY TO THE MODERN CITY SKY ROPE-WAY AND BOTTOM CABLE-LINER

A short History of World Metro Systems - in Pictures

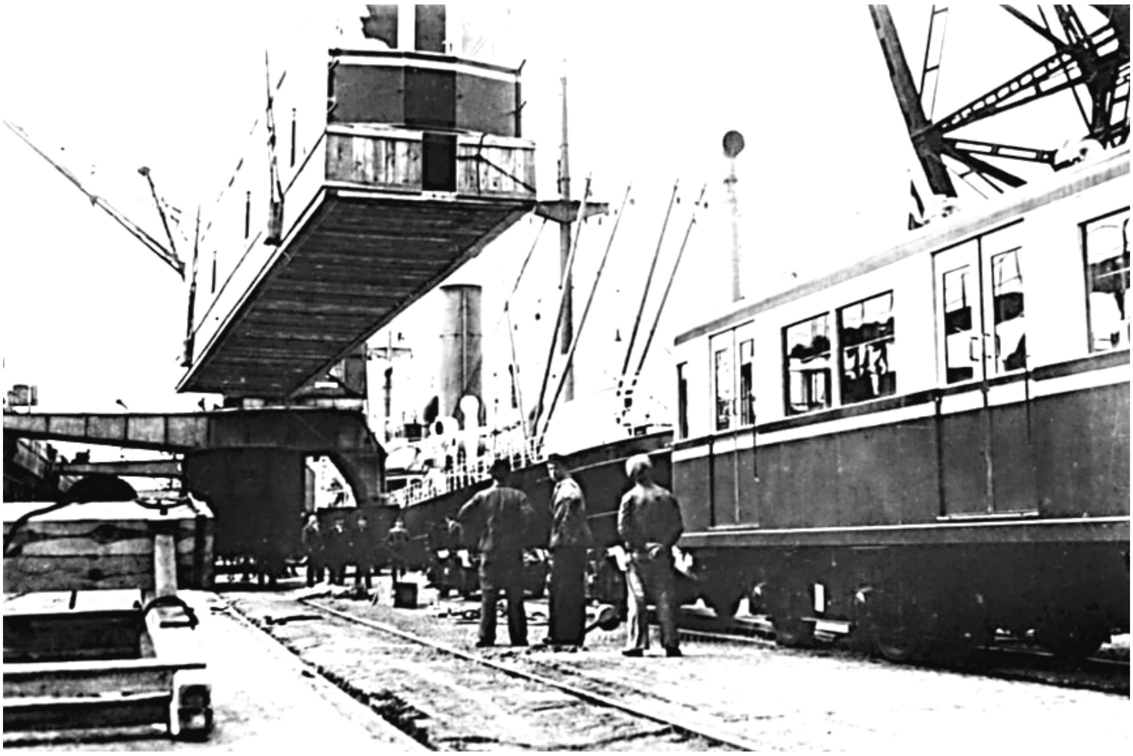
From the world's first steam-railway subway system, the London Underground, to the metropolitan ropeway system in La Paz.

Composed by F. A. Wingler, revised March 2019

The London Underground, which opened in 1863, was the World's first Underground Steam Railway System. More than 30,000 Passengers tried out the "Tube" on the opening Day and it was hailed by the Times as "the great engineering triumph of the day"; **England;** pictured: William Gladstone on an Inspection of the first Underground Line. Photograph: Hulton Getty

https://www.theguardian.com/cities/gallery/2014/sep/10/-sp-history-metro-pictures-london-underground-new-york-beijin...

The New York City Subway is now over 110 Years old; pictured: A Workman caulks Joints with Lead to make them waterproof during the Construction of the 6th Avenue Subway Tunnel in June 1939**; USA;** Photograph: NY Daily News via Getty Images



Opened in 1913, the Buenos Aires Metro **in Argentinia** is the oldest in Latin America; pictured: Wooden Subway Cars are unloaded in 1934. Photograph: Keystone-France/100% Keystone

Moscow's Metro is famed for the grand Designs of its Stations, sometimes dubbed the People's Palaces; pictured: Novoslobodskaya Metro Station**; Russia;** Photograph: Linda Nylind for the Guardian

A Moment between Trains in Kosmonavtlar (Cosmonauts) Station, Tashkent Metro, Uzbekistan; the Stop is famous for its dreamlike Portraits of Cosmonauts

After the ban on photographing the Tashkent Metro in Uzbekistan was lifted this summer, Amos Chapple, RFE/RL's photographer went underground to reveal the art, architecture and nuclear-blast protection in Central Asia's oldest subway system.

Rail guided inflated Rubber Tire Carriageway Metro System in Santiago de Chile - an Underground Road-Bus Railway Hybrid

Jaipur Metro-Railway on elevated Structure in India, touted as one of the fastest built Metro Systems

The World`s first Experimental Mono-**R**ail, System ALWEG/HLB, Cologne, Germany, in the 1960-ties

ALWEG was founded by Swedish industrial magnate Dr. Axel Lennart Wenner-Gren in January 1953 as ***Alweg-Forschung, GmbH*** (Alweg Research Corporation), based in asuburb of Cologne, Germany. The company was an outgrowth of the ***Verkehrsbahn-Studiengesellschaft*** (Transit Railway Study Group), which had already presented its first monorail designs and prototypes in the previous year. The ALWEG name is an acronym of Dr. Wenner-Gren's name (**A**xel **L**ennart **WE**nner-**G**ren).

Turnout System of Straddle-Beam Mono-Rail, Okinawa; Japan

Autonomous Dubai Airport Underground People Mover running with guided inflated Rubber Tires on a **Roll-Way; Emirates**

An old Carriage decorated for Christmas on the urban Overground Tram Metro-System of Zurich, Switzerland

The Swiss metropolitan towns, Zurich, Basel and Bern have decided not to go underground but overground with their city tram-way transit systems.

Funicular as Part of the **M**etropolitan public Transport System of Graz**;** Austria

Dual Mode combined City-Tram and Railway-Train **"TRAM-TRAIN"** System, Karlsruhe**;** Germany

In several European cities the Transits are running in the city underground and overground as a tram and outside as a railway-train on the grid of the national railway.

Suspended Sky Train in Quingdao**, System *SAFEGE*;** China

120 Years old suspended Sky**-**Transit in Wuppertal**;** Germany**-**

Autonomous **Centre guided** Skyline People Mover running with inflated Rubber Tires on elevated **Roll-Way**, Frankfurt Airport**;** Germany

Autonomous **Cantilever** suspended Sky-Train People Mover at Dusseldorf Airport**, System Siemens/SAFEGE;** Germany

Public Transport with Maglev-Train, System Transrapid, Shanghai; China

“Low Speed” 90 kmph experimental Maglev-Train for public urban and suburban Transport System, System M. Bögl; Germany

This system can run like a roller coaster in hilly terrain.

Lahore, Pakistan, Metro-Bus on dedicated Lanes

Istanbul, Turkey, Metro-Bus on dedicated Lanes

Fully autonomous Volvo Bus operates in Singapore

Metro-Bus on the Flange-guided O-Bahn Busway Route in Adelaide; Australia

"Right-of-Way" Center-Rail Guided People-Mover Bus on elevated Roll-Way, Los Angeles, Airport; USA

"Right-of-Way" Center-Rail Guided People-Mover Bus, Los Angeles, Airport; USA

Autonomous last Mile People-Mover Road Shuttle

Waterway-Metro, Kochi; India

Kochi should become in India the first city, where the entire public transport with the metro-railway, the buses, the boats, the auto-rickshaws and the taxies work together as a seamless integrated system with a common timetable, common ticketing and a centralised `command and control'.

Metro Waterway public Transport in Istanbul; Turkey

Sky Ropeway-Metro in La Paz**, System Doppelmayr;** Bolivia

Bottom operated Cable pulled CLS *"CABLE-LINER"* Train "Bolivariano" rolling on an elevated Guidway in Caracas; Bolivia; System Doppelmayr

Underground *"CABLE-LINER"* Sheremetyevo International Airport Moscow; Russia; System Doppelmayr

Multi-modal Transport Hub at Kottawa-Makumbara, Colombo, connecting Highway-Bus, Town-Bus, Taxi and MRT-Railway **for an integrated Metropolitan Transport System; Sri Lanka**

Envisaged integrated multimodal Metro-Hub-System for Indore; India

FAZIT:

METRO has be understood today as a mean of integrated different modes for public transport in urban and suburban metropolitan area for **URBAN MOBILITY.** The term **METRO** is derived from Metropolis and has nowadays become a synonym for integrated urban and suburban puplic transport in metropolitan area.

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IRJ

Renew and expand

Incoming Brazilian president sets the agenda for rail freight development

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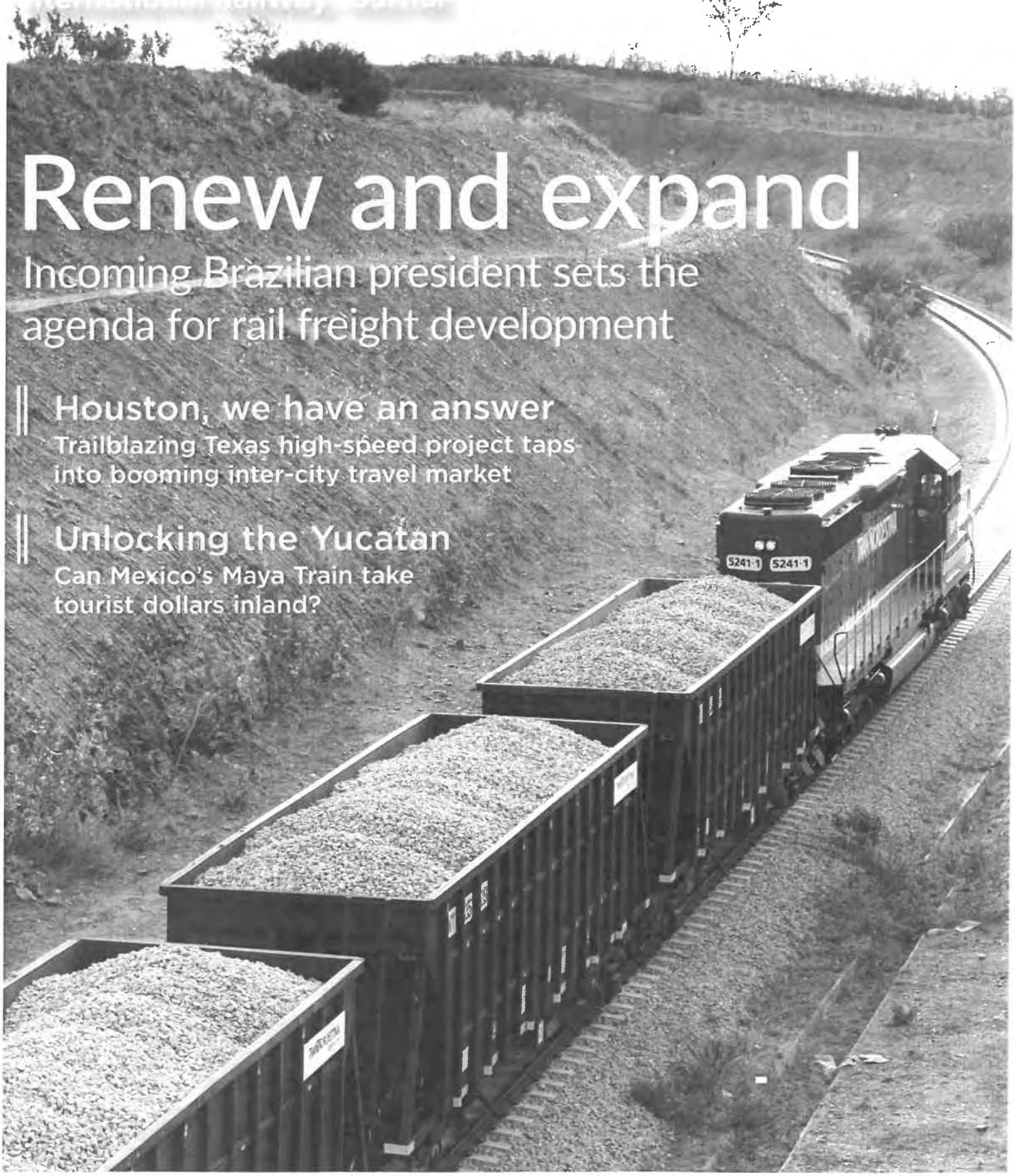


Sheffield - Rotherham tram-train finally opens

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

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

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

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

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

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

Palermo to expand tramway network

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

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

The seven schemes are ranked in order of priority:

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

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

Berlin to establish S-Bahn vehicle pool

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

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

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

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

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

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

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

Transport for London and Siemens sign Piccadilly Line fleet renewal contract

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

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

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

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

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

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

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

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

Barranquilla LRT project moves forward

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

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

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

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

Delhi metro network reaches 300km

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

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

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

Milwaukee launches The Hop Streetcar

Photo: David Wilson

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

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

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

In brief

Almaty

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

Berlin

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

Bern

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

Budapest

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

Düsseldorf

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

London

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

Montreal

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

Munich

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

Turin

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

Urumqi

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

Zaragoza

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

São Paulo targets rail expansion

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

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

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

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

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

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

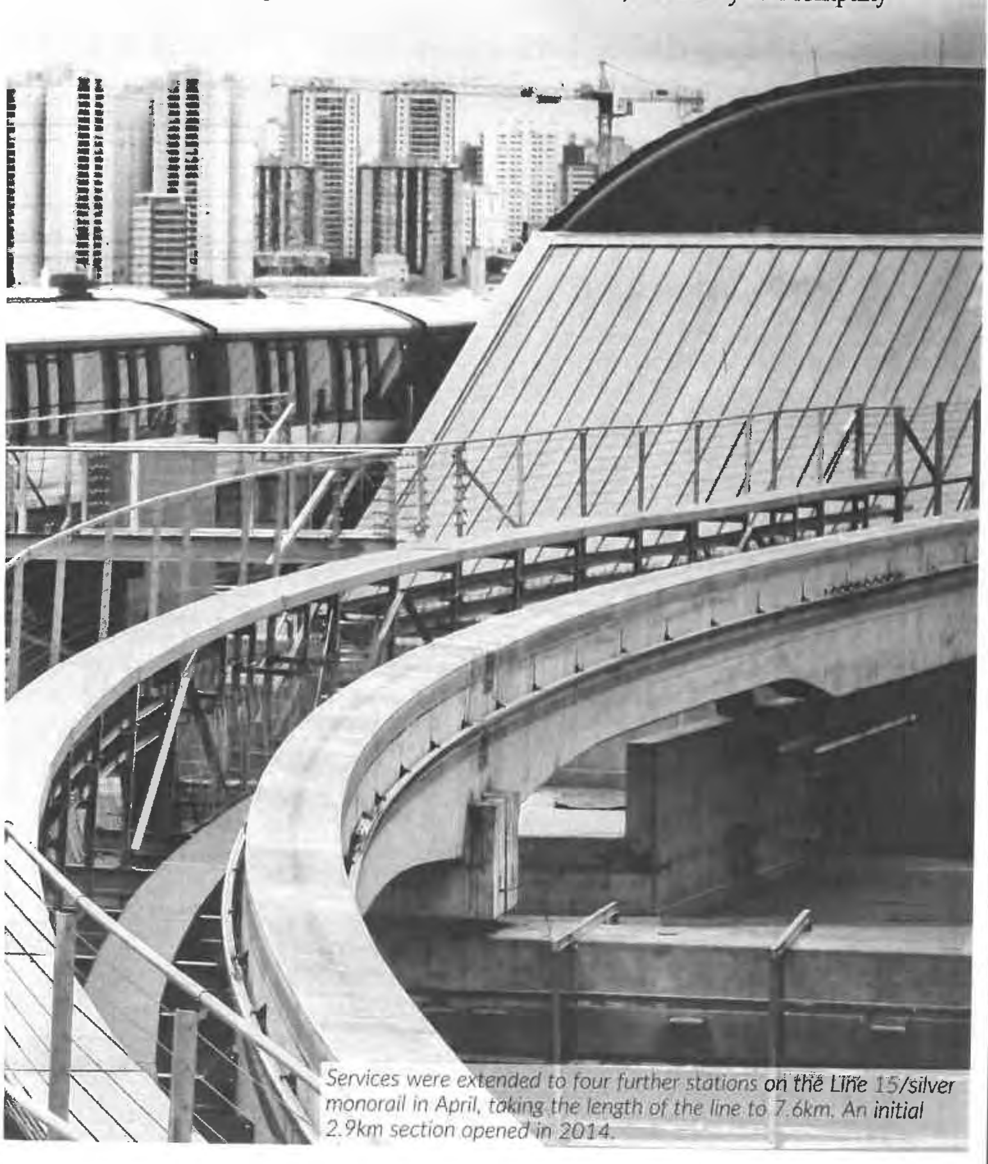
Marchesi says. "It follows a more liberal economic line and investment will be reinforced mostly with the support of the private sector. We also have a very high expectation for medium-speed regional trains."

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

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

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

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



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

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

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

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

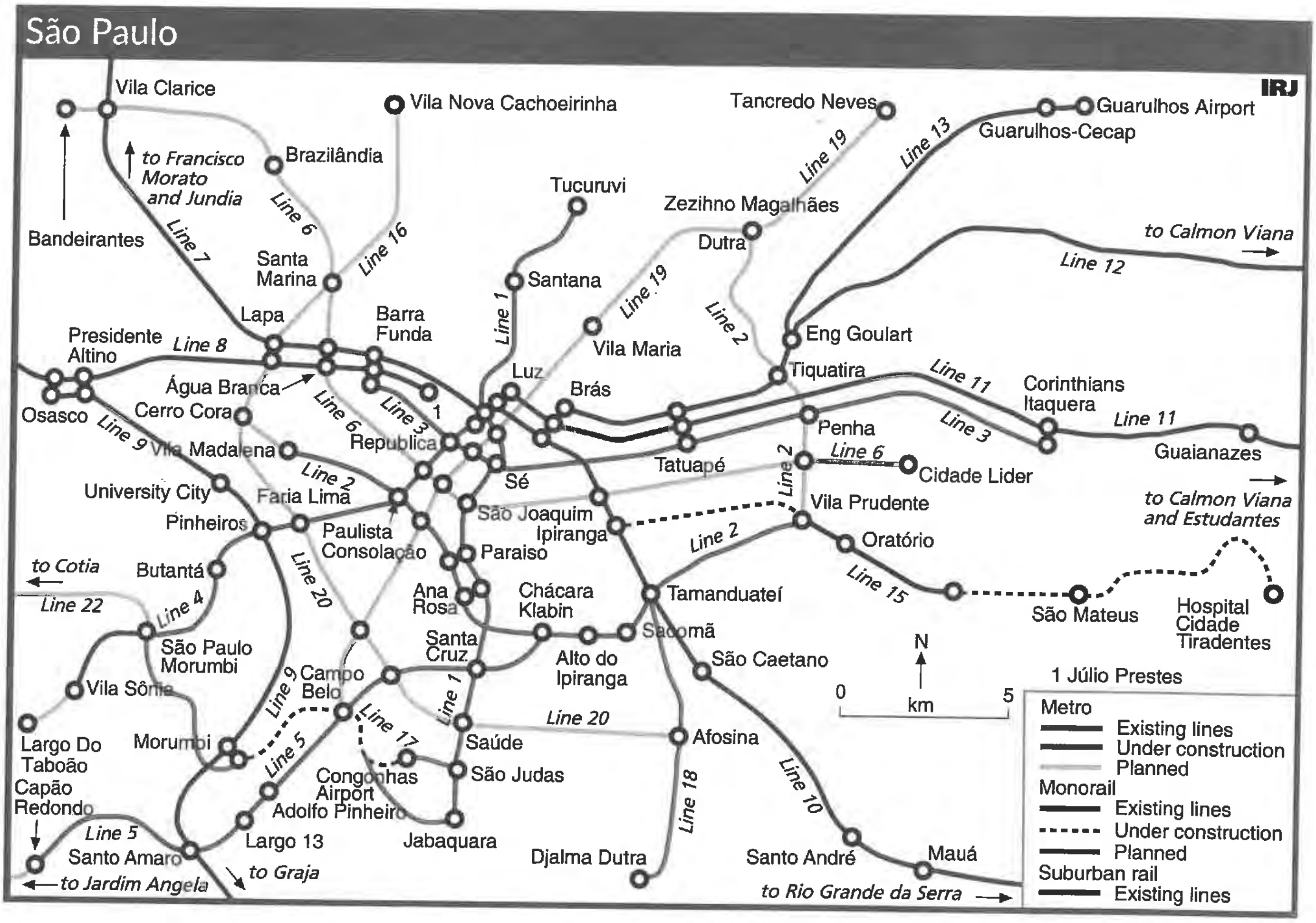
There is also a direct stopping service between Brás and Guarulhos Airport, which currently only operates in the early morning and early evening. A half-hourly service is also available, but passengers have to change between lines 12 and 13 at Engineer Goulart. The Temoinsa-Sifang consortium is currently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

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

Line 4 is 11.3km long and has 10

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

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



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

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

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

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

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

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

CBTC

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

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

São Paulo inter-city project gains momentum

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

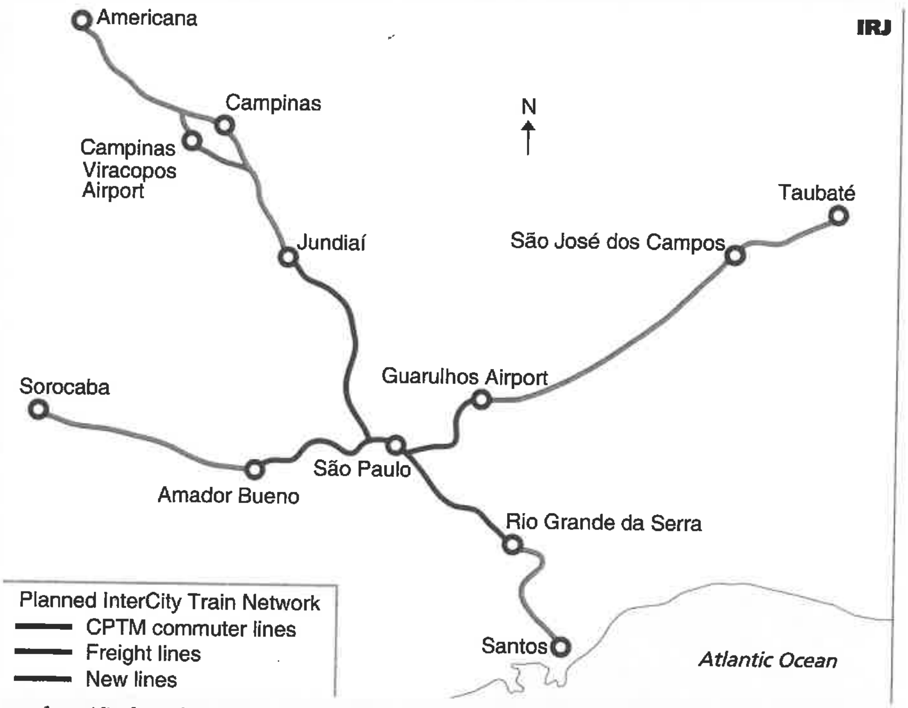
The two lines will intersect in São Paulo and will serve 24 stations. The north-south line will connect Americana with Santos while the east-west line will run from Sorocaba to Taubaté. The network should directly and indirectly serve 173 cities and carry more than 170,000 passengers a day.

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

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

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

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



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

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

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

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

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

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

Light rail

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

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

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

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

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

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

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

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

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

Automating Switzerland's Waldenburg Railway

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

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

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

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

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

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

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

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

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

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

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

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

Red mile

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

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

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

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

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

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

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

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

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

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

The infrastructure analyses and the findings of the studies of regulations

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

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

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

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

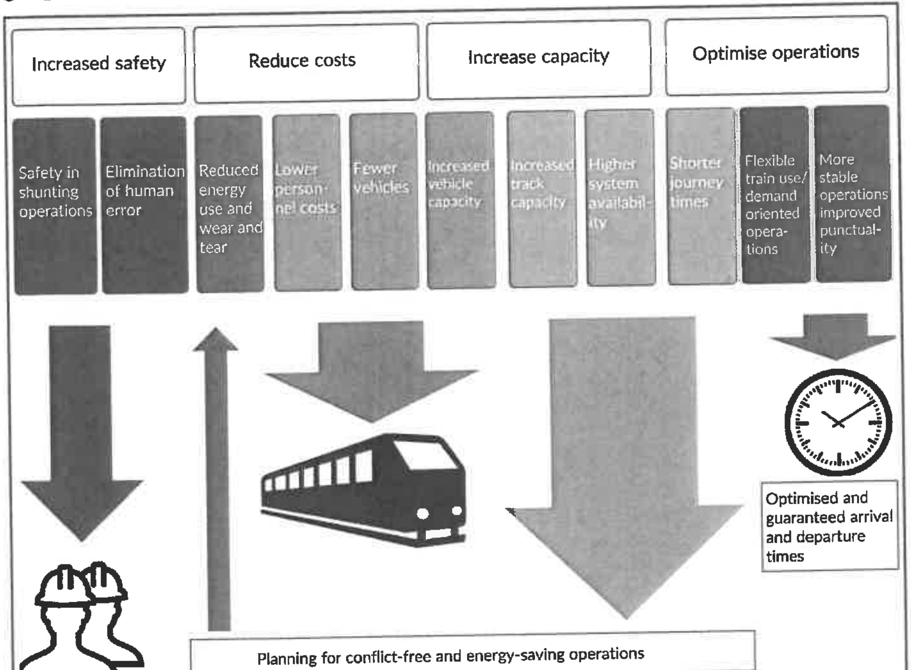
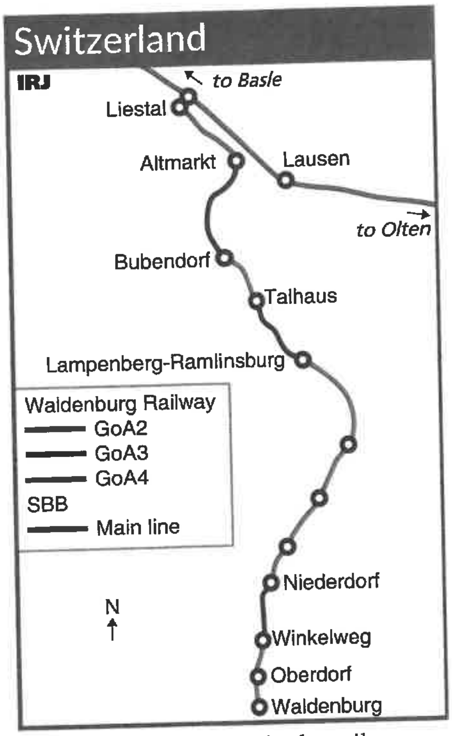


Figure 1: The benefits and impact of automated rail operations.



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

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

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

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

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

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

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

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

Rendezvous

January 2019

29-30—London, Britain
NEW: Transport Ticketing Global Exhibition & Conference
⏩ Clarion, London, Britain.
www.transport-ticketing.com/

February 2019

3-4—Cairo, Egypt
NEW: 2030 Mega Projects Conference
⏩ IPG, Cairo, Egypt.
⏩ Pyramids, Cairo, Egypt.
www.megaprojectsconf.com/

8-9—New Delhi, India
NEW: Exporail India Exhibition
⏩ Inter Ads Brooks, Haryana, India.
www.exporailindia.com/english/

20-22—Frankfurt, Germany
NEW: 7th International Railway Summit
⏩ IRITS, London, Britain.
www.irits.org/irs7/

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

27-28—Berlin, Germany
NEW: Fire Protection of Rolling Stock Conference
⏩ Arena, London, Britain.
www.arena-international. com/fprs/

March 2019

4-5—Melbourne, Australia
NEW: Light Rail 2019 Conference
⏩ Informa, Sydney, Australia.
www.informa.com.au/event/conference/light-rail/

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

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

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

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

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

26-28—Lille, France
NEW: Sifer 2019 Exhibition
⏩ Mack Brooks, St Albans, Britain.
www.sifer2019.com

26-28—Utrecht, Netherlands
Railtech Europe
⏩ Promedia, Breda, Netherlands.
https://events.railtech.com/europe2019/

26-28—São Paulo, Brazil
21st NT-Expo - Business on Rails
⏩ UBM, São Paulo, Brazil.
www.ntexpo.com.br/en/

April 2019

10-12—Izmir, Turkey
Eurasia Rail Exhibition
⏩ ITE, Istanbul, Turkey.
http://eurasiarail.eu/Home

14-17—Graz, Austria
Modern Rolling Stock Conference
⏩ Schienenfahrzeugtagung, Graz, Austria.
www.schienenfahrzeugtagung.at/en/

May 2019

10-12—Kuala Lumpur, Malaysia
Rail Solutions Asia Conference & Exhibition
⏩ TDH, Cranleigh, Britain.
www.tdhrail.co.uk/rsa/

14-16—Birmingham, Britain
Railtex Exhibition
⏩ Mack Brooks, St Albans, Britain.
www.railtex.co.uk/2019/english/

14-16—Moscow, Russia
NEW: ElectroTrans Exhibition
⏩ Rusgortrans, Moscow, Russia.
www.electrotrans-expo.ru/en

22-23—Munster, Germany
NEW: IAF Digitilisation and Infrastructure Congress
⏩ VDEI, Frankfurt, Germany.
www.vdei.de/aktuelles/veranstaltungsuebersicht/icalrepeat.detail/2019/05/22/3024/-/3-iaf-kongress-bahnbau

28-29—Munich, Germany
NEW: The Rise of IoT & Big Data in Rail 2019 Conference
⏩ Rotaia, Ashford, Britain.
www.iotandbigdatainrail.com/

June 2019

4-7—Munich, Germany
NEW: Transport Logistic Exhibition
⏩ Messe Munich, Munich, Germany.
www.transportlogistic.de/index-2.html

METRO NEWSLETTERS
on
URBAN MOBILITY

PUBLIC MULTIMODAL URBAN, SUBURBAN AND INTERURBAN PASSENGER TRANSIT SYSTEMS WITH METRO-BUS, LIGHT-RAIL, METRO-RAIL, REGIONAL RAPID TRANSIT, COMMUTER-RAIL, ROPE-WAY/TRAIN, WATER-METRO, AUTOMATED PEOPLE-MOVER

TRANSPORTATION AND ECONOMIC DEVELOPMENTS IN MODERN URBAN/MEGAPOLIS ENVIROMENT

METRO Newsletter by Dr. F.A. Wingler
METRO 18, January 2019


Dharamshala Ropeway People Mover Project; India

PART I: ACTIVITIES FOR URBAN MOBILITY SOLUTIONS IN INDIA

Himachal Pradesh HC seeks fresh Status Report on Shimla Ropeway Project; India

Anand Bodh | TNN | Updated: Jul 16, 2018, 09:31 IST

SHIMLA: The Himachal Pradesh high court has sought a fresh status report on the construction of ropeway project connecting Inter State Bus Terminus, Tutikandi, with the Mall Road in Shimla. The HC has directed the chairman of committee constituted by it to file the report in terms of its June 13 order.

During the last hearing, the court had directed the additional chief secretary to convene a meeting of all the stakeholders in two days to fix the timeline and milestones required to be adhered by all (stakeholders). It had asked the committee to file the report in two weeks.

On June 13, the court had observed that several steps needed to be taken by various authorities on an urgent basis and had set up a committee headed by additional Chief Secretary Ram Subhag Singh. Other members of the committee included the Shimla deputy commissioner; the commissioner of Shimla municipal corporation; the principal chief conservator of forests, Himachal Pradesh; the director, town and country planning, Himachal Pradesh; and representative of the project proponent and or any other person or authority, who may be found necessary. Recommended By Colombia During the hearing on July 12, a division bench of acting Chief Justice Sanjay Karol and Justice Sandeep Sharma appointed senior advocate Jyotsna Rewal Dua as amicus curiae. Advocate general Ashok Sharma stated that proposal for forest clearance, complete in all respects, shall be forwarded to the central authorities withintwo days.

Assistant solicitor general of India Rajesh Kumar Sharma stated that the proposal shall be processed expeditiously in terms of June 13 order. The counsel for the company executing the project said complete files for seeking permission and no objection certificate (NOC) for “crossover forest area” shall be submitted to the municipal corporation within a week. Files shall be processed and forwarded to agencies and departments concerned within a week thereafter, said municipal corporation counsel Naresh Gupta.

Latest Comment

Project execution also has become part of the courts now. We have become so lethargic that unless the order is from court we shall not even move!S Chopra See All Comments Add Comment Sharma said they shall personally take up the matter with all the departments concerned and ensure that files are processed and decision taken thereupon expeditiously and not later than two weeks thereafter. Advocate General said that in the event of project proponent facing any difficulty, he shall personally take up the matter with the department concerned. During the last hearing, the project proponent had informed the court that delay was on account of non-submission of documents and proposal and according permission by the authorities under various environmental laws. On this, the court had observed that there has been inordinate and unexplained delay in executing the work.

ISBT Ropeway to be Reality soon; India

It will link Firhill to Shimla ISBT, Rani Jhansi Park on The Mall and Jodha Niwas

Pratibha Chauhan
Tribune News Service
Shimla, June 19

The Tourism Department on Tuesday decided to clear all hurdles coming up in the ISBT-Jodha Niwas ropeway project by holding a single public hearing and expediting the forest clearances required for the long-pending project to take off. It will be aimed at reducing the traffic congestion in the capital.

Additional Chief Secretary (Tourism) Ram Subhag Singh chaired a meeting with all stakeholders to expedite the project. The meeting was attended by Usha Breko representatives, who are executing the project, and officials from the Forest, Revenue, Tourism, Town and Country Planning and Public Works Departments.

The MoU for the ropeway was signed on June 17, 2015, between Usha Breko and the Shimla Municipal Corporation (SMC). The length of the project is 3.5 km with a total of four stations. The stations will be Tourist Information Centre near the bypass, Firhill, Lift and Jodha Niwas.

“With the company having been asked to reduce the number of trees that were to be axed from 1,200 to 600, the height of towers and land requirement of the company has gone up,” said Singh. A deadline of one week has been fixed for the submission of the revised forest clearance, which will be done online. A small working group comprising the DFO, SDM and company representatives has been formed to ensure the approvals.

The completion period of the project was three years while the concession period was fixed at 40 years. The ropeway will link Firhill from the outskirts of the town to the ISBT and later to Rani Jhansi Park on The Mall and finally at Jodha Niwas. The annual income of Rs 10.62 crore that the MC will get from the project will help the cash-strapped SMC to improve its financial health.

The ropeway will help reduce traffic congestion as most of the small vehicles entering the town will be parked on bypass near the ISBT and people will travel by the ropeway. However, following several glitches, work has been delayed on the project. The High Court too has directed the government to grant all sanctions and expedite it as it will greatly help reduce traffic congestion in the town.

About the Project

- The then Himachal Pradesh Chief Minister, Virbhadra Singh, had laid the foundation stone of a ropeway connecting the Inter-State Bus Terminus (ISBT) to The Mall in 2015.
- The passenger ropeway will have four stations along its total length of 3,600 metre. The project was expected to be completed within three years of the stone-laying ceremony.
- The project is being undertaken by Usha Breko, and will cater to 1,000 passengers per hour per direction.

Rs 150-200 cr is the project cost
3.5 km is length of the project
Rs 10.62 cr annual income for MC
3 years is completion period

Ropeways and Cable-Cars are Future of public Transport in India: Nitin Gadkari

By
Rajat Arora

Gadkari called for the use of alternate fuels in transport sector. He said, by use of methanol, ethanol and electric sources, the country can make huge savings on petroleum imports.

Minister for Road Transport, Shipping and Water Resources Nitin Gadkari has said that the country needs futuristic technology for developing its transport sector.

He stressed upon the need to cut down congestion and resultant pollution in cities. Reiterating his commitment for promoting transport innovations that are pollution free and cost effective, he said that ropeways, cable cars, funicular railways can be very useful means of transport for hilly and difficult terrains and as last .

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Reiterating his commitment for promoting transport innovations that are pollution free and cost effective, he said that ropeways, cable cars, funicular railways can be very useful means of transport for hilly and difficult terrains and as last mile connectivity options in congested cities. He said these transport options would also be very useful for tier two cities and hoped these would motivate people to shift from personal to public transport.

Gadkari was speaking in New Delhi today at the MoU signing between WAPCOS and Doppelmayr for providing end-to-end solutions for passenger ropeway projects. WAPCOS is a leading engineering consultancy organisation of the Government of India, which has grown into an Indian multinational with projects in over 45 countries across the world. Doppelmayr, Austria are the world's largest ropeway manufacturers with cutting-edge ropeway technologies. It has set up more than 15,000 ropeway installations across the world.

The MoU includes the entire gamut of preparing feasibility studies, detailed project reports, construction, equipment supply, operation and maintenance, etc. It will enable development of ropeway projects in various states using globally accepted standards for passenger safety and reliability. These projects will not only reduce traffic congestion and pollution, but will also contribute towards development of tourism destinations and provide impetus to employment generation in the country.

Gadkari again called for the use of alternate fuels in transport sector. He said, by use of methanol, ethanol and electric sources, the country can make huge savings on petroleum imports.

Read more at:
//economictimes.indiatimes.com/articleshow/66513505.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst

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- **L&T Metro Rail (Hyderabad) Limited**
- **Hyderabad Metro Rail**
- **Project Highlights**
- **Rolling Stock**

About L&T Metro Rail Limited; India

Larsen and Toubro Limited was awarded the Hyderabad Metro Rail Project by the then Government of Andhra Pradesh. L&T incorporated a Special Purpose Vehicle (SPV) - L&T Metro Rail (Hyderabad) Limited ("The Company") to implement the Project on Design, Built, Finance Operate and Transfer (DBFOT) basis. The Company signed the Concession Agreement with the then Government of Andhra Pradesh on 4th September, 2010 and completed the financial closure for the Project on 1st March, 2011 in a record period of six months. A consortium of 10 banks led by State Bank of India has sanctioned the entire debt requirement of the project. **This is the largest fund tie-up in India for a non-power infrastructure Public Private Partnership (PPP) Project.**

Rolling Stock

Rolling Stock Features:

- Metros around the world are there to give comfort to the commuter and at a price which is easy on the pocket. India's millions and the especially the denizens of Hyderabad will be in for this experience in a few years from today.
- The specification for standard gauge rolling stock is based on light weight stainless steel/Aluminum- bodied three-car formations, having a trailer car between two motored

driving cars. Internal wide gangways will provide ease of passenger movement and assist load distribution. Trains will be air- conditioned throughout with designated space for differently abled persons. LCD screen type route map indicators over all the doors and LCD TVs at suitable locations inside cars shall be provided for infotainment. Safety of commuter and operations is paramount for us and the trains will have foolproof safety features and on-board fire & smoke detection as well.

- These trains will have CCTV cameras in and outside the cars, mobile and laptop charging sockets inside the car, better humidity control, microprocessor-controlled brakes, secondary air-suspension for better ride comfort and will be capable of maintaining an average speed of 33 km/h and maximum operating speed of 80 km/h. The trains will be using regenerative electric braking thereby converting the momentum into electrical energy and feeding back to power supply system while braking. As a contribution towards the CDM this will reduce the energy requirement from the grid.
- The maximum capacity per three car train will be approximately 965 including longitudinal seating, giving a high proportion of the floor area to standing passengers. Each car will have longitudinal seats for approximately 40 persons.
- Total 171 cars for 57 Trains will be procured for the first phase of the project. Although with many automated functions, the ATO enabled trains will be under driver control.
- Having all salient features which will add to the comfort and safety of the commuter, it is aesthetics combined with comfort and safety which will win the metro-user and make them addicted. Hyundai Rotem (Korea), were chosen based not only on latest technology and price but also on cost of maintenance, service and availability of spares.. Our endeavor is to have an improvement on the existing Metro-Rail trains.

Salient Features of Rolling Stock

Train Set	3 Cars train set (DMC-TC-DMC) Extendable to 6 Cars train set (DMC-TC-MC-MC-TC-DMC)
Gauge	Standard Gauge (1435 mm)
Traction	25 kV AC Overhead Catenary, Single phase and 50 Hz frequency
Maximum Design Speed	90 kmph
Maximum Operating Speed	80 Kmph
Average Speed	33 Kmph

Head way between two trains	3 minutes during peak and 15 minutes during lean hours
Dwell Time	20 seconds at stations
Maximum Axle Load	17 Ton with 8 Passenger/Square metre in standing area
Safety features	Automatic Train Protection (ATP)/ Automatic Train Operation (ATO)
	Automatic Train Supervision
	Passenger Emergency Alarm
	Passenger Addressing System
	CCTV in cars
	Saloon Door opening and closing Alarm
	Fail Safe Pneumatic Emergency Air Brake
	Provision of Dead man safety feature on the Traction-Brake controller handle
	Wheel Slip/Slide Protection
	Crash-Worthy design of Cars
	Derailment Guard on rails

	Smoke and Fire detectors in Driver's Cab and Saloon Car
	Fire extinguishers inside cars and driver's cab
	Emergency brake application in a moving train if unintended partings of the cars occur.
	Platform screen door enable features in Rolling Stock
Car Body	Light Weight Stainless Steel/Aluminium
Energy Efficient	Energy regeneration during electro dynamic braking.
Interior	Dedicated space to accommodate wheelchair (for people with reduced mobility)
	Longitudinal Seats, Grab Poles and Rails for standing passengers
	Air-conditioned with Humidity Control
	Mobile and Laptop Charging Points
	LCD TVs for Entertainment, information and advertisement
	LCD Dynamics Route Display
Exterior	Modern and Aesthetic, unpainted, covered with vinyl sheet for advertisement

Current Collection System	Overhead Pantograph
Doors	Externally hung, sliding bi-parting Doors for Saloon
Windows	Double Glazed Laminated glass with PVB film pasted in between
Brakes	a) Electro-pneumatic friction brake system (EP) b) Electric-regenerative brake system c) Spring applied air-release parking brake system d) Electro-pneumatic friction emergency brake system e) Brake-pipe controlled back-up security brake system
Couplers	Automatic and Semi Permanent Couplers
Air-conditioner	Two Roof mounted VAC for Saloon and One for Driver Cab
Propulsion System	25kV AC Single phase, IGBT based VVVF Control
Bogie	Bolster less with Secondary Air Spring
Train Control	Train Integrated Management System (TIMS)
Battery Back-up	Battery Back-up upto one hour for emergency loads i.e Lights, PA/PIS etc.

Kochi Metro; India

About Us

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Vision

To enrich the quality of life for everyone in Kochi by facilitating better connectivity between people, between people and places, and between people and prosperity.

Mission

To make Kochi a more liveable and pleasant city for residents and visitors alike, where public transportation would be used by all – connecting people and places safely, seamlessly, reliably and comfortably.

Towards an integrated Transportation System

Five years ago, Kochi Metro Rail Limited was started with the objective of building and running a metro line, but later we decided to use KMRL as an opportunity to migrate citizens from personal vehicles to public transport and change the face of transportation and mobility in the process. KMRL is trying to build itself as Kerala's urban transport solutions provider. By being the first metro system in the country with an integrated multimodal transport system, Kochi Metro will not only give the city a much-required face-lift but also provide an end-to-end connectivity.

Our objective is to make Kochi the first city in the country, where the entire public transport system: The metro, the buses, the boats, the auto-rickshaws and the taxies work together as a seamless integrated system; with a common timetable, common ticketing and centralised `command and control'.

Strategic Goals

- To introduce a world-class metro system in Cochin to enhance the quality of life for the Greater Kochi metro area by improving regional connections and reducing overcrowding, traffic congestion, transit time, air and noise pollution.
- To adopt a stakeholder approach to improve connectivity and quality of life by coordinating and consulting with important stakeholder groups, such as community

groups, business groups, environmental groups, state and central governments, architects and planners, and various regulatory agencies.

- To connect metro with the Cochin International Airport to create seamless transition, transit, and interconnectivity.
- To plan and extend the metro to Fort Cochin.
- To create transport hubs with metro, bus and rail links.
- To increase the economic vitality of the region by improving infrastructure resulting in the further development of the greater Kochi area as an economic, transportation, and tourism hub.
- To be accountable for our actions.

Values

- **Safety and Service**: We commit to provide a safe, reliable and customer-friendly transportation experience.
- **Community Involvement**: We value being a part of the greater Kochi community and strive to contribute to the economic growth and development of the area.
- **Stakeholder Engagement**: We pledge to work with all the stakeholders, including customers, employees, local businesses, local community, civic societies and appropriate state and federal governmental authorities, in our operations.
- **Cultural and Environmental Sustainability**: We believe in sustainable economic development where infrastructural, economic and ecological concerns are integrated into smart growth
- **Employee Empowerment**: We commit to a work environment where employees are treated with respect, they take responsibility for results and their teamwork is rewarded.
- **Fiscal Responsibility & Accountability**: We pledge to being fiscally responsible as well as being accountable for our actions.

Operational Goals

- To ensure that the planners reflect the socio-cultural, economic, and environmental impact of the proposed system.
- To link investments in public transportation systems with land-use planning.
- To minimize property acquisition and other displacements in the implementation of the project.
- To support existing and planned economic activities.
- To encourage an environmentally sustainable approach to planned development.
- To build a metro system with rider security and comfort as the most important considerations.
- To achieve economic feasibility and cost-effectiveness in the implementation of the strategic objectives.

Board of Directors

1. **Shri Durga Shanker Mishra**, Chairman – Secretary, Ministry of Housing and Urban Affairs, Room No.122 C, Nirman Bhavan, New Delhi – 110011
2. **Shri Mukund Kumar Sinha**, Nominee Director, OSD (UT) & Ex-officio Joint Secretary, Ministry of Housing and Urban Affairs, Room No.138 C, Nirman Bhawan, New Delhi – 110011
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5. **Shri D.K. Saini**, Nominee Director, Director (Projects), Delhi Metro Rail Corporation, Metro Bhawan, Fire Brigade Lane, Barakhamba Road, New Delhi – 110001
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13. **Shri D.K. Sinha**, Director (Systems), Kochi Metro Rail Ltd., 8th Floor, Revenue Tower, Kochi – 682011
14. **Shri Kumar K.R.**, Director (Finance), Kochi Metro Rail Ltd., 8th Floor, Revenue Tower, Kochi – 682011

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Why Kochi Metro

- Ministry of Urban Development predicts an average city speed of 6 to 8 kmph by 2030, which is the speed of a morning walker, if urban transport is not properly planned and developed now.
- The present transport facilities are inadequate to handle every day demands.
- Gridlocks and congestion are routine now; they result in wastage of manpower, fossil fuels, increase pollution and act as dampeners to economic development.
- The traffic snarls force people to spend time on the road which they would otherwise spend with their friends and families.
- Further road development is very limited owing to geographical and demographical limitations.
- Therefore alternate modes of urban mass transport and multimodal integration have to be planned.
- The Kochi Metro Rail Project is the first move in such a direction in Kerala.
- Accessing jobs, education, livelihoods and other social needs from the outskirts into the business centre of the city would become less time-consuming and quality of life will increase for the urban population.

- The average citizen would get a reliable, safe, economic, comfortable, user-friendly and punctual mode of transport at affordable rates.

Indore and Bhopal Metro Rail Projects approved by Modi-led Cabinet! All you want to know about the Infra Noost; India

By: Devanjana Nag | Published: October 4, 2018 11:18 AM

The Cabinet, chaired by the Prime Minister Narendra Modi, has approved two big metro projects in a bid to improve the metro rail connectivity in two prominent cities of Madhya Pradesh - Bhopal and Indore.

Envisaged Indore and Bhopal METRO as an integrated multi-modal urban and suburban public Transport System

The tenders for first civil work package have been invited already and work on the metro projects will start soon. (image: Madhya Pradesh Metro Rail Co Limited website)
Big Boost to metro connectivity in Madhya Pradesh: The Cabinet, chaired by the Prime Minister Narendra Modi, has approved two big metro projects in a bid to improve the metro rail connectivity in two prominent cities of Madhya Pradesh – Bhopal and Indore. For the implementation of the metro projects in both these cities, an SPV namely Madhya Pradesh Metro Rail Co Ltd. (MPMRCL) has been constituted. A press release stated that the tenders for first civil work package have been invited already and work on the metro projects will start soon.

Indore Metro Rail Project

For Indore city, the Cabinet has approved the implementation 31.55 km long Ring line from Bengali Square – Vijay Nagar – Bhawarsala – Airport – Patasia – Bengali Square. The Ring line is likely to connect major public nodes and city cluster areas of Indore. The Ring line, which will cover 30 stations, is being developed at a cost of Rs 7500.80 crore. The Indore Metro Rail Project is also likely to be completed in four years.

After the completion of the Indore Metro Rail Project, population of 30 lakh of the city will be benefited as it will provide connectivity to all the densely populated areas of the city with the new developing areas along with railway station, airport and ABD under the Smart City project. Also, the metro project will provide eco-friendly as well as sustainable public transport to residents, regular commuters, students, office workers visitors and travelers. Bhopal Metro Rail Project.

To improve the metro connectivity across the state capital, the Cabinet has approved the implementation of two corridors of total length 27.87 km including the stretch from Karond Circle to AIIMS of 14.99 km and the 12.88 km long stretch from Bhadbhada Square to RatnagiriTiraha. The Karond Circle to AIIMS corridor will cover 16 stations while Bhadbhada Square to RatnagiriTiraha corridor will cover 14 stations. For the development of the Bhopal Metro Rail Project, around Rs 6941.40 crore will be spent and it is likely to be completed in four years.

The government is hopeful that once the project is complete, the entire population of Bhopal will get the benefit from what it says will be an affordable, reliable, safe, secure and seamless transport system.

One of the interesting factors about these corridors is that they will be having multimodal integration with railway stations as well as BRTS stations, and also they will have feeder network of bus services, intermediate public transport and non-motorised transport.

The Cabinet informed that the metro projects will have non-fare box revenue from rental and advertisement as well as Value Capture Financing through mechanism of Transit Oriented Development and Transfer of Development Rights.

PART II: ACTIVITIES FOR URBAN MOBILITY SOLUTIONS INTERNATIONAL

JICA proposes underground Railway for Yangon; Myanmar

Clare Hammond 11 Aug. 2015

Yangon's Circular Commuter Railway is in for an Upgrade as Part of JICA's ambitious Plans for Yangon Transit. Photo: Aung Htay Hlaing / The Myanmar Times

JICA proposes Underground Commuter Railway

Japan International Cooperation Agency (JICA) will invest US$250 million to upgrade Yangon's circular railway and has also proposed building two underground railway lines, as well as a light rapid transit system to improve the flow of traffic around the city.

Such large-scale infrastructure investment is necessary, as Yangon's population is projected to double from 5.1 million to 10 million by 2040 – or 1.5 million more people than are currently living in Bangkok, said Shigehiko Sugita, deputy director of JICA's Southeast Asia and Pacific Department, to *The Myanmar Times*.

Unless drastic action is taken to upgrade the city's creaking infrastructure, in five years' time residents are likely to look back with nostalgia on the traffic jams of today, according to JICA research, which forecasts that vehicle use in Yangon could rise 22-fold over the next 25 years.

"Bangkok didn't develop proper urban transport which is why it is so congested," said Mr Sugita. "The good news is that Yangon – like London or Tokyo or Moscow – already has a circle line. This shows potential."

On July 4, Japanese Prime Minister Shinzo Abe pledged to modernise Yangon's 46-kilometre (28-mile) circular railway and committed to a $250 million soft loan. The

Japanese government, through JICA, will upgrade the infrastructure, including new trains and signalling, said Mr Sugita. Myanma Railways will be responsible for upgrading the track and tendering the existing 38 stations for redevelopment.

In the longer-term, however, Yangon faces a much bigger problem. Even if the circular railway is upgraded to an international standard with fast and frequent trains, it will not be able to support a population of more than 10 million, said Mr Sugita.

Beyond this, there are three main options – Light Rapid Transport (LRT) such as a tram or a monorail, Metro Rapid Transport (MRT) and Bus Rapid Transport (BRT), he said.

“In our Yangon comprehensive masterplan we have proposed all three, but we cannot do all of them at once. BRT is the easiest to start with as you can just use the existing route.”

In May, the government announced a modern bus system called “BRT Lite” based on a 2013 plan by JICA, which will be funded through a public-private partnership. New bus lanes will be laid out and new buses imported.

Myanma Railways believes the city needs another railway line, said Mr Sugita, adding that the authority had the idea of installing a monorail from the north to the south of the city, along the western bank of Inya Lake.

JICA is also supporting a new tram line from Kyeemindaing to Strand Hotel. “After this pilot project we will extend the line, and we are considering perhaps building a small circular tram line. LRT is easier and cheaper than MRT but it will also not be sufficient to support the entire population,” said Mr Sugita.

It costs roughly three times more to build an underground railway than to build a monorail, he said, but in the longer term an MRT would yield much better results. “They built an LRT in Manila and it’s very crowded. It’s worse than Japan. So in Yangon we are also pushing for an MRT – it’s much stronger,” he said.

“We would like to build two metro lines – one from the north to the south of Yangon and another from east to west, as well as a line to Dala and to Thilawa,” he added.

“JICA may consider funding an MRT – the master plan is now under discussion,” he said, adding that Korea and China are also interested and that both countries have already put forward proposals to the government.

In the meantime, work on the circle line upgrade will begin in 2016, following a year of planning, and the entire project is due for completion in 2020, said Mr Sugita.

The first stage of the upgrade will cover the track running through the most densely populated part of the city, from Danyingone in western Yangon to the central railway station downtown. JICA will also offer technical assistance for an extension of the circular railway which will run to the Thilawa special economic zone to the southeast of Yangon.

“Our target is for air conditioned trains to run every 10 minutes, at an average speed of 30 kilometres [19 miles] per hour,” he said – the same average speed as trains in Tokyo. Trains will be able to run up to a maximum of 80km per hour. Currently in Yangon, rickety trains without air conditioning or cushioned seats run every 10 to 40 minutes, at an average speed of 15km.

Initially JICA considered an elevated railway. “But we failed, as the centre of Yangon is on a hill and the soil is very weak. We would have had to dig 40 to 50 metres into the ground every 100m to support the track, which would have been too expensive,” said Mr Sugita.

For the circular railway upgrade, too, there are several challenges to overcome. For example, residents living along the side of the tracks have been asked to make way. “There are some houses and vegetable plantations very close to the track. The residents won’t have to move to a new location, but we have asked them to move back,” he said.

However, unlike in cities such as Manila and Phnom Penh, because the railway tracks are already in place relatively few people will need to move, he said. “Still, we have discussed the social considerations with Myanma Railways.”

Myanma Railways initially wanted the trains to be electrified but, while this is the long-term plan, the trains will initially run on diesel. “Electrification is the future goal, but if we did this now and there were still houses without power there would be some conflict, so Myanma Railways was kind enough to give up the idea,” said Mr Sugita.

Yangon Subway System

http://viss.wordpress.com/2012/03/03...subway-system/

Plans for a Yangon Subway System?

____

April 23rd, 2012, 06:31 PM #2

SeeMacau
Moderator

The online community has been abuzz about potential plans for a Yangon subway system, when a map showing different lines connecting Yangon emerged late last last year.

Join Date: Sep 2002
Posts: 29,082
Likes (Received): 1915

On February 15 this year, Reuters made this report:

"We are now talking with international companies for the construction of both a skytrain and underground train system for the commercial capital Yangon," the minister, Aung Min, told Reuters in an interview.

"There is no such project planned for Naypyitaw," he said, referring to the small, newly built capital.

Aung Min said the train systems in Bangkok and Beijing were models for the planned Yangon system.

"The (interested) companies are Singaporean, Japanese and Germany and American … We are now talking with them." Asked how long it might take to build the system, he said: "We will implement this on a build, operate and transfer policy, so it depends on the terms."

The Irrawaddy added that Siemens (which built Bangkok's SkyTrain system) may be among the prospective contractors.

Earlier in February, local media, such as The Voice, reported that a Ministry of Rail Transport said this:

The online map has nothing to do with the Ministry. An outsider drew this plan.

This [map] may just be part of a scheme by businessmen to speculate and manipulate the market prices of Yangon's real estate nowadays.

The article also notes that plans for a subway system are in special economic zone proposals for Yangon city's economic plan (perhaps referring to the 30-year Yangon Concept Plan). Minister Aung Min also confirmed these plans at a recent parliamentary hearing. And the quoted ministry official did say this:

"The plan must be done. [...] We've started to negotiate with the Japanese and Norwegians. But we're only in the stage of stage of preliminary discussions."

But, in August of last year, Russian media reported that Russian contractors were in plans to construct a 50 kilometer subway line in Naypyidaw. A month later, the Ministry of Rail Transportation shelved such plans, considering them economically unfeasible and unnecessary for the enormous 7,000 square kilometer city (the size of Delaware, an American state and almost 7× the size of Yangon). And yet building Naypyidaw, at an estimated cost of $4-5 billion USD was a necessary expense.

There's even a Facebook page 'Yangon Subway Project', with already 1,074 fans. Its about page says this:

Officials of the Railway Transport Ministry have said that there are Yangon Subway plans. This FB page intends to relay news relating to the Burmese railways, news on Yangon's developments, stories about international subways as well as imaginary plans, as seen fit.

____

	Strip Over 20 hotels under construction with more than 60,000 rooms, Shopping Centers, Entertainment Facilities and Casinos.

Experts stress need for public transport

Experts stress Need for public Transport in Mandalay; Mayanmar

Si Thu Lwin 07 Jul. 2015
Experts stress need for public transport

French public transport experts predict that the population of Mandalay will double within the next 10 years – and that a public transport system is required to serve them. The report by Fonds d'étude et d'aide au secteur privé (FASEP), an infrastructure fund administered by the French government's Ministry of Finance, spoke of "deep anxiety" if public transport needs were not met.

The report said Mandalay needed a metro system and a mass-transit bus network in order to promote the city's sustainable development.

"Mandalay has a population of 1.4 million, but that is likely to double over the next 10 years. Urban transportation is a key challenge. But the city still requires to develop a public transit system," said a FASEP official.

FASEP suggests a public transit system including two metro lines, railways and a bus network.

Buses with a high level of service, or BHLS, should connect with other means of transport, the report says.

The system would require 19 bus stations and a terminal for 20 buses.

Daw Khin May Htay from Mandalay City Development Committee told *The Myanmar Times*, "They pointed out what is necessary for public transportation. The situation will only get worse later on unless something is done. Both external and internal investment will be needed to implement this project. Air pollution is getting worse because of the mass of private cars and motorcycles in the city. Living standards must be improved."

The proposed BHLS buses would run at a speed of 20 kilometres an hour, taking 39 minutes for the route and arriving every five minutes. FASEP estimates that 45,000 passengers will use the route daily in 2020.

New Taipei Light Rail Line opens; Taiwan
Dec. 27, 2018

Written by Keith Barrow

TRIAL passenger operation began on the first phase of the Danhai light rail network in New Taipei on December 24 with a month of free rides on the 7.3km Green Mountain Line.

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The 11-station line connects Hongshulin station on the Taipei Metro Red Line with Danhai New Township.

During the initial phase of operations trams are running at 15-minute headways between 06.30 and 22.00.

Services are operated by a fleet of 15 Warrior trams built by Taiwan Rolling Stock Company (TRSC).

The LRVs, which are the first modern light rail vehicles to be built in Taiwan, were developed for TRSC by Voith Engineering Services at its Competence Centre for Rail Vehicle Development in Chemnitz, Germany.

Each 34.5m-long five-section bidirectional vehicle accommodates 265 passengers and has a maximum speed of 70 kmph

.A three-station branch to Danshui Fisherman's Wharf, which will be known as the Blue Ocean Line, is due to open next year.

Categories: AsiaLight RailNews
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Santiago de Chile Metro; Chile

This system runs with inflated rubber tires on a Roll-Way, guided by Flange Rails as a Hybrid Road-Bus Railway

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on
URBAN MOBILITY

PUBLIC MULTIMODAL URBAN, SUBURBAN AND INTERURBAN PASSENGER TRANSIT SYSTEMS WITH METRO-BUS, LIGHT-RAIL, METRO-RAIL, REGIONAL RAPID TRANSIT, COMMUTER-RAIL, ROPE-WAY/TRAIN, WATER-METRO, AUTOMATED PEOPLE-MOVER

TRANSPORTATION AND ECONOMIC DEVELOPMENTS IN MODERN URBAN/MEGAPOLIS ENVIROMENT

METRO Newsletter by Dr. F.A. Wingler
METRO 19, January 2019

Integral Maka Gondola Metro, Istanbul; Turkey

PART II: ACTIVITIES FOR URBAN MOBILITY SOLUTIONS INTERNATIONAL

Integral Multimodal Public Metropolitan Transport in Istanbul; Turkey

Source WIKIPEDIA

Public Transport in Istanbul is an integral and interactive metropolitan transport service comprising bus network on dedicated lanes, various rail systems (tram, underground, railway), funiculars, gondolas and maritime-seaway (sea-bus) services to serve the more than 13 million inhabitants of the city spread over an area of 5712 km².

Transportation today

Metro

Main article: Istanbul Metro

Osmanbey Station of the Istanbul Metro

The first line (M1) began service on 3 September 1989 between Aksaray and Kartaltepe. The line was further developed step-by-step and reached Atatürk Airport on 20 December 2002. The line has 18 stations and is 19.6 kilometres (12.2 mi) long. As of 2012, daily ridership was 416 journey and 210,000 passengers. Even if its numbered as the first line, actually the line is a LRT system with many common characteristics with the T4 line, including the rolling stock. Though they are categorized differently by the operator.

The construction of the underground railway in Istanbul began in 1992. The *first line* (M2) between Taksim and 4th Levent went into service on September 16, 2000. This line is 8.5 km long and has 6 stations, which all look similar but are in different colors.

A northern extension from 4th Levent to Atatürk Oto Sanayi station in Maslak (Ayazağa) entered service in 2009, as well as a southern extension from[5] Taksim to Şişhane station in Beyoğlu, near the northern entrance of Tünel. Last northern extension for short term, Hacı Osman was opened in 2011. The rest of the southern section of the metro, which will run to Yenikapı, across the Golden Horn on a bridge and underground through the old city, is also under construction. The southern extension of M2 from Şişhane to Yenikapı over the new Golden Horn Bridge is opened in 2013 permitting the line to reach the Yenikapı Transfer Center. Finally the Airport (M1A) and Bağcılar (M1B) lines' eastern terminus was extended from Aksaray to this transfer center in 2014.

On the Asian side, 26.5 km (16.5 mi) long M4 line opened on 17 August 2012 up to Kartal. The line will have a total of 19 stations when the second section as far as Kaynarca opens. A connection to Sabiha Gökçen Airport is proposed.

Construction has also begun on the M5 which will link Üskudar, Ümraniye and Çekmeköy on the Asian side.

Currently there are 124 Hyundai-Rotem (M2) and 120 CAF[6] (M4) trains in service. A trip along the entire line takes 27 (M2) and 32 (M4) minutes.

All lines are operated by Metro Istanbul (the new name of Istanbul Ulaşım A.Ş.) which belongs to the Municipality of Istanbul.

Tram

Main article: Istanbul Tram

Istanbul inaugurated horse trams in 1872 and these served the people of Istanbul until 1912. Following this date, electric trams were put in place and they were the main means for urban public transport until 1966. Many routes were built step by step, and it reached their most widespread network in 1956 with 108 million passengers in 270 shuttles in 56 lines. Tramcars were not modernized for many decades, and some of the 1911 electric cars were still running in the 1960s. At that time modern buses provided faster and smoother journeys. Because of those negative issues, tram system closed in mid-1960s.

From the early 1970s, traffic congestion worsened. By the mid-1980s, Istanbulians realized that the uncontrolled extension of motorization & closure of the tram network had been a mistake. Other cities around the world, e.g. Tunis and Buenos Aires, also understood that error, and like them, Istanbul also planned the return of tramway.

As an experiment, Istanbul first opened a heritage tram at European side in 1990. Due to increasing popularity, they opened a modern tram system starting in 1992, also at European side. Now, the Asian side has a heritage tram system, whereas the European side has both a heritage tram and a modern tram system.

The modern tram consists of lines T1 and T4, initially operated with 55 low-floor Bombardier Flexity Swift and 32 Alstom Citadis.[8] The other line (T4) was opened in 2007 between Edirnekapı and Mescid-i Selam. There are 22 stations and length is 15,3 km . Since March 2009, the line works between Topkapı and Hapibler Service is operated with LRT vehicles built by SGP in 1989. As of 2012, daily ridership was 380 journey and 100,000 passenger.

Commuter Rail

Starting from June 2013, suburban lines on both sides of the city (Istanbul suburban and Haydarpaşa suburban) were closed for rehabilitation works as well as for their fusion into a single line by the means of an undersea tunnel through the Bosphorus as part of the Marmaray project.

As of August 2016, only the underground parts of the Marmaray between Kazlıçeşme and Ayrılık Çeşmesi are operational, the rest of the line being still under re-construction.

Funicular

Operated by İETT, the *Tünel* (1875) in Istanbul was the first underground railway line in continental Europe, and the second subterranean railway line in the world after London's *Underground* (1863).

Istanbul is served by two underground funicular railways, of very different ages and styles.

The older of these lines is the Tünel. This line is the oldest underground metro line in continental Europe, and the second in the world after London. The Tünel is 573 m long with an altitude difference of 60 m and no intermediate stations between Karaköy and Tünel Square. It has been continuously in service since 1875. It was originally steam-powered with two wooden trains serving parallel tracks. It was modernized in 1971. Today the line is single-track with a passing loop, electrically powered and runs on rubber tyres with rebuilt ex-RATP MP 55 vehicles. A trip takes approximately 1.5 minutes. About 15,000 people use the line each day. Unlike the modern one below which runs at strictly five-minute intervals, this one has a less regular schedule.

Opened in June 2006, a second modern funicular line, the Kabataş-Taksim Funicular, is operated by Ulaşım A.Ş.] and connects the Seabus port and tram stop of Kabataş with the metro station at Taksim Square. It is about 600 meters long and climbs approximately 60 meters in 110 seconds.

Bus Rapid Transit (BRT)

Metrobüs BRT in Istanbul

The bus rapid transit (BRT) system in Istanbul is called *Metrobüs*. The construction of the Metrobüs BRT line began in 2005. The first line runs between Avcılar and Söğütlüçeşme. This line is 41.5 km long and has 35 stations, which are located on Istanbul's Main Highway, called the D 100. It is currently operated with Mercedes Capacity, Mercedes-Benz Citaro, and some Phileas buses. Daily ridership is 715.000 passenger.

An extension to Beylikdüzü opened in 2012.

Ferryboats

The commuter Ferry *Emin Kul*

Ferryboats sail on 15 lines serving 27 seaports on the shores of Bosphorus and Sea of Marmara. The 20 older ferryboats carry 61 million passengers yearly.[In the 1980s 150 million people were transported.

Today, there are 3 types of ferry in İstanbul; Sea Busses (İDO), Vapur's (traditional name for commuter ferries) and private motorboats.

The first steam ferries appeared on the Bosphorus in 1837 and were operated by private sector companies. On 1. January 1851, the *Şirket-i Hayriye* (literally *The Goodwill Company*, as the Istanbul Ferry Company was originally called) was established by the Ottoman state. The *Şirket-i Hayriye* continued to operate the city's landmark commuter ferries until the early years of the Republican period; when they went under the direction of *Türkiye Denizcilik İşletmeleri* (*Turkish State Maritime Lines*). Since March 2006, Istanbul's traditional commuter ferries have been operated by municipality.

The current design of the Istanbul ferries, as we know them today, was largely created by the Fairfield Shipbuilders of Glasgow, Scotland, which also built the largest amount of Istanbul ferries since 1851. The companies which designed and built the traditional commuter ferries of Istanbul include the White Shipbuilders of East Cowes, England (models of 1854-1860); the M. Wigram Shipbuilders of London, England (models of 1863-1869); Maudslay & Sons of London, England (models of 1870-1872); R. & H. Green Shipbuilders of London, England (models of 1872-1890 and 1894–1896); J. W. Thames of London, England (models of 1890-1893); Napier, Shanks & Bell of Glasgow, Scotland (models of 1893-1894); Fairfield Shipbuilders of Glasgow, Scotland (models of 1903-1906, 1910–1911, 1914–1929, and 1938–1962); Armstrong Shipbuilders in Newcastle and Glasgow, United Kingdom (models of 1905-1907); Atl. & Chantiers de France in Dunkerque, France (models of 1907-1911); Hawthorn Leslie and Company in Newcastle, England (models of 1911); Kinderdijk L. Smith & Zoon Ltd, Holland (models of 1951); Cantieri Navali di Taranto SPA, Taranto, Italy (models of 1952); and Hasköy, Camialtı, and İstinye Shipyards in Istanbul(models of 1929-1938 and 1962–1989).

Seabus

On 16 April 1987 the Municipality of Istanbul established a company to provide fast sea transport with catamaran-type *seabuses*. With the first ten vessels purchased from Norway, modernization of sea transportation was achieved. Today, the company İDO serves 29 terminals with a fleet of 28 catamarans, including six fast car ferries.

Aerial Lift

Maçka Gondola Tandem C**abins at Taşkışla Terminal**

.

There is a short gondola lift line above the Democracy Park in the valley between Taksim and Maçka, the Maçka Gondola (Turkish: *Maçka-Taşkışla Teleferiği*), built in 1993. It connects the hotels Hilton Istanbul Bosphorus on one side with Parksa Hilton and Swissotel The Bosphorus on the other side. The cable line is 333 m (1,093 ft) long and transports in two cabins with six seats each around 1,000 passengers daily. The trip takes three minutes.

A second aerial lift line, the Eyüp Gondola (Turkish: *Eyüp-Piyerloti Teleferiği*) was opened in 2005 between the historical district of Eyüp and the Pierre Loti Hill. The gondola lift, built by the Italian Leitner Ropeways Co. of Leitner Group was the most expensive cable car line in Turkey costing 5 million Euros.

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METRO Newsletter by Dr. F.A. Wingler
METRO 20, December 2019

New Taipei Light Rail Transit (LRT), Taiwan

PART I: ACTIVITIES FOR URBAN MOBILITY SOLUTIONS IN INDIA

Metro Rail current Developments in India; India

- Around 650 km of metro rail projects are at various stages of implementation in Delhi & NCR, Kolkata, Bangalore, Chennai, Kochi, Jaipur, Mumbai (including State initiatives by MMRDA), Hyderabad, Nagpur, Ahmedabad, Lucknow, Pune, Noida, Bhopal and Indore.
- About 750 km of metro rail systems and 373 km of Rapid Rail Transit Systems (RRTS) are under planning in various cities.
- In 2018 (from January, 2018 to till date), about 110 km of metro rail lines have been commissioned in Delhi & NCR, Hyderabad and Chennai

First Metro Train for Ahmedabad finally arrives; India

Himanshu Kaushik | TNN | Updated: Jan 1, 2019, 14:21 IST

AHMEDABAD: The first metro train of three coaches with a carrying capacity of 90 passengers finally arrived in the city on Tuesday. The first train had been shipped from South Korea in first week of December and had arrived at Mundra Port on December 28.

According to Gujarat Metro Rail Corporation officials the first train of three coaches of Ahmedabad Metro Project (MEGA) moving from Hyundai Rotem local port facilitates from South Korea will make it trail run from January 15 after which the state is expected to take a call on the inauguration.

Recommended by Colombia

The train according to Metro-Link Express for Gandhinagar and Ahmedabad will be ready to be rolled on the six km elevated corridor between Vastral Gam and Apparel Park in Maninagar by March end of April. After the trial run the train will have to be cleared for safety measures by various department of the Union Government.

Prime Minister Narendra Modi is likely to flag of the train. GMRC officials says the Urban Development department has been conveyed that the MEGA will be ready by January 15 and they can plan the inauguration accordingly. The six km stretch will have four other station apart from Apparel park and Vastral Gam. The other station includes Nirant Cross roads, Vastral, Rabari Colony and Amraiwadi. The officials said that from Apparel park the metro will go underground and will be underground till Shahpur.

The mock coach has arrived in October and has been on display at the river front for public viewing. The officials said that the second train is likely to arrive by March end or early April. The officials further said that the authorities plan to start the second stretch on the APMC to Motera stretch also by April this year.

Foundation Stone for Vizag Metro Rail Project to be laid by February next Year; India

27 December, 2018 by Team - Rail Analysis India
Team - Rail Analysis India

Date of Post: 27 Dec, 2018

Visakhapatnam: The state government has speeded up the process for the 42.55 km long Vizag (Visakhapatnam) Metro Rail (VMR) project. On Wednesday, Principal secretary, urban development R Karikal Valaven and municipal administration held a review meeting on the project in Visakhapatnam. The metro project is estimated to cost around Rs 8,300.

More Information:

- VMR managing director M P Ramakrishna Reddy, VMRDA commissioner Basanth Kumar, commissioner of GVMC M Hari Narayan, and other senior officials took part in the meeting.
- As many as 38 stations were planned with covering the 3 corridors in the project.
- The 3 corridors are — Gurudwara to Old Post Office (5.25 km), Kommadi to Gajuwaka (30.8-km) and Thatichetlapalem to Chinna Waltair (6.5 km).

- The VMR is the biggest project proposed under the public- private partnership mode.
- The government was ready to provide 250 acre land, on Amaravati Metro Rail project.
- Foundation stone for the Vizag Metro Rail project will be laid by February next year.
- 92.4% of the land required for the project belongs to the government and there would be no problem to acquire the remaining land, Reddy said.
- Already, the railways has sanctioned permission and NOC from National Highway Authority of India was awaited.
- As many as 2 depots were proposed for the Metro Rail.
- He added that the VPT is giving its land for 1 depot near Airport and revenue officials are working to allot land near Hanumanthawaka for the 2nd depot.
- MLA P Vishnukumar Raju asked the officials to extend the project to Anandapuram as there is a many engineering colleges located their.

To know more about recent developments of Railways –

07 Dec, 2018: Visakhapatnam Metro Update: Special meeting conducted to discuss progress of Visakhapatnam Metro project

05 Jul, 2018: Vizag Metro Update: Andhra Pradesh CM urges Amaravati Metro Rail Corporation To Expedite Work on Visakhapatnam Metro Project

28 Feb, 2018: Visakhapatnam Metro Update: 5 Firms Submit Bids For 43 km Long Visakhapatnam Metro Rail Project

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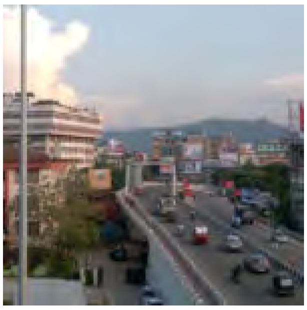
- 
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Center approves Worth Rs 5,900 Crore Faridabad-Gurugram Metro Project; India

27 December, 2018 by Team - Rail Analysis India
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Date of Post: 27 Dec, 2018

The Central government on Monday approved a Metro line between Faridabad and Gururgram, Union Minister of State, Krishan Pal Gurjar informed. There will be 7 metro stations on this route. The project is expected to open to public in April 2021, he said.

More Information:

- The stations on the metro route will be – Barkal Enclave, Bhati Mines, Sushant, Mandi, Pali Stone Crescent, Sector-45 and Sector-54.
- The project would cost around 5,900 crores including 3,777 crores for land acquisition, he further informed.
- A detailed report will be shared within 6 months, he added.
- The metro will have a top speed of 110 kmph, but it will be allowed to run at a speed 100 kmph.
- Meanwhile, Delhi government has approved the Phase-4 project of Delhi Metro rail.
- The Phase-4 project will have 79 new stations over 104 kms route.

- Out of the 104, 31.47 km will be underground while 64.39 km tracks will be elevated corridor.
- The project is expected to be completed by 2024.

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26 Dec, 2018: Delhi Metro Update: CMRS inspects Lajpat Nagar-Mayur Vihar Pocket-1 corridor of Pink Line

26 Dec, 2018: Delhi Metro Rail Completes 16 Years Of Its Journey

24 Dec, 2018: JICA to offer loan assistance of Rs 20,196 crore for phase-2 of Chennai Metro Rail project

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Delhi Metro Update: CMRS inspects Lajpat Nagar-Mayur Vihar Pocket-1 Corridor of Pink Line; India

26 December, 2018 by Team - Rail Analysis India
Team - Rail Analysis India

Date of Post: 26 Dec, 2018

New Delhi: The 9.7-km Lajpat Nagar-Mayur Vihar Pocket 1 corridor of the Delhi Metro's Pink Line was on Monday inspected for safety, paving way for its opening, officials said. The new segment of the 59-km-long Pink Line, which spans from Majlis Park to Shiv Vihar, is part of the Phase-3 of the DMRC network.

More Information:

- A senior DMRC official said,"The Commissioner of Metro Railway Safety (CMRS) on Monday inspected the Lajpat Nagar-Mayur Vihar Pocket 1 corridor of the Pink Line. The 9.7-km segment has 5 stations, 3 underground and 2 elevated."
- The 5 stations are-
    - Vinoba Puri
    - Ashram
    - Hazrat Nizamuddin
    - Mayur Vihar Ph-I
    - Mayur Vihar Pocket-1
- The official said, Mayur Vihar Ph-I and Mayur Vihar Pocket-1 are elevated stations.
- The DMRC on Monday also inaugurated an exhibition in the upper area of the foyer of Rajiv Chowk station, on completion of 16 years of its operations.
- Former Prime Minister late Atal Bihari Vajpayee had inaugurated the DMRC's first-ever corridor – an 8.2-km stretch between Tis Hazari and Shahdara stations of the Red Line – on December 24, 2002.
- The 3.2 km long Escorts Mujesar-Raja Nahar Singh (Ballabhgarh) section of the Violet Line was opened to public in November, taking the entire span of the Delhi Metro network to 317 km.
- While the Shahdara-Tis Hazari section had 6 stations, DMRC now boasts of 231 stations, with an average daily ridership of about 28 lakh.
- As part of Phase-IV of the DMRC, a 103 km-long project has been proposed and Delhi Metro will continue to serve people with greater amenities and efficiency, the official said.
- The DMRC had also launched its Twitter account On December 20, which now has over 3,200 followers.

To know more about recent developments of Delhi Metro-

26 Dec, 2018: Delhi Metro Rail Completes 16 Years Of Its Journey

20 Dec, 2018: Delhi government approves much-awaited Phase-IV project of Delhi Metro

04 Dec, 2018: Delhi Metro Update: Dilshad Garden to New Bus Adda corridor of Red Line to open on December 25

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JICA to offer Loan Assistance of Rs 20,196 crore for Phase-2 of Chennai Metro Rail Project; India

24 December, 2018 by Team - Rail Analysis India
Team - Rail Analysis India

Date of Post: 24 Dec, 2018

Chennai: The JICA (Japan International Cooperation Agency) will offer loan assistance of Rs 20,196 crore for the 52.01km phase-2 of Chennai Metro Rail project, the Tamil Nadu government said. JICA has approved funding for the phase-2, which would cost an estimated Rs 40,941 crore, a state government release said.

More Information:

- The release added that it is aimed at extending Metro rail connectivity between Madhavaram and Sholinganallur (35.67 km) and from Madhavaram to Chennai Mofussil Bus Terminus (CMBT) (16.34 km).
- Union Finance ministry, additional secretary, C S Mohapatra and Japan Ambassador to India, Kenji Hiramatsu formally exchanged documents at an event in New Delhi, on Friday.
- The loan agreement for providing the first tranche under the Official Development Assistance (ODA) of 75,519 million Japanese Yen (about Rs 4,770 crore) was also signed between Mohapatra and JICA, chief representative, Katsuo Matsumoto.
- On the occasion, additional chief secretary, TV Somanathan and Chennai Metro Rail, managing director, Pankaj Kumar Bansal were also present.
- The funding would further enhance Metro Rail connectivity to various parts of the city.

To know more about recent developments of Chennai Metro-

22 Dec, 2018: Japan to lend 75.5 billion yen for Chennai Metro's phase-2 project

19 Dec, 2018: Chennai Metro Update: Metro services between AG DMS and Washermenpet to start by January-end 2019

15 Dec, 2018: Chennai Metro Update: CMRS to conduct final inspection on AG-DMS to Washermanpet stretch in January next year

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NMRC gets Approval to launch commercial Operations of Aqua Line; India

22 December, 2018 by Team - Rail Analysis India
Team - Rail Analysis India

Date of Post: 22 Dec, 2018

Noida: The Noida Metro Rail Corporation (NMRC) gets the approval to launch commercial operations of the Aqua Line. A final and mandatory safety inspection report has given the NMRC the approval to launch commercial operations of the Aqua Line, officials said on Friday.

More Information:

- The NMRC has now written to the Uttar Pradesh government to finalise the date of inauguration of the much-awaited Aqua Line.
- The Aqua line would run between Sector 71 station in Noida and the Depot Station in Greater Noida, covering 29.7 km through 21 stations.
- NMRC Executive Director PD Upadhyay said,"The Commissioner of Metro Rail Safety (CMRS) report has been received and it has its sanction for the commercial operations of the metro service."
- The report also praised the civil and track work of the metro system, Upadhyay said.
- NMRC's managing director has written to the state government for finalizing the date of inauguration, said Upadhyay, who was in Lucknow on December 21, handed over a letter to Chief Secretary Anup Chandra Pandey.
- The fares of the Aqua Line would be decided in the NMRC Board meeting scheduled on December 28, he also said.
- He added,"Chairman Sanjay K Murthy, the additional secretary to the Ministry of Housing and Urban Affairs will chair the meeting."

To know more about recent developments of Noida Metro –

12 Dec, 2018: Noida-Greater Noida Metro corridor to open for public on Christmas

24 Nov, 2018: PM Modi to Inaugurate Noida-Greater Noida Metro corridor and Delhi Metro's Red Line extension on December 25

22 Nov, 2018: Tenders floated for E-rickshaw service at all 21 stations on Noida-Greater Noida Metro Corridor

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Lucknow Metro Starts Energisation Work of receiving Sub Station (RSS) at Mahila Polytechnic, Munshipulia; India

22 December, 2018 by Team - Rail Analysis India
Team - Rail Analysis India

Date of Post: 22 Dec, 2018

Lucknow Metro Rail Corporation has started the energisation work for the Receiving Sub Station (RSS) at the Mahila Polytechnic, Munshipulia. This sub-station will feed power supply to the traction and all the Metro stations of the balanced section from KD Singh Stadium to Munshipulia part of the 23 km long North-South Corridor (Phase 1A) This is another milestone which has been accomplished by the LMRC towards the commissioning of this corridor which is much ahead of its scheduled deadline with the most advanced equipment.

This RSS is designed to feed 25kV traction power and 33kV auxiliary power to the Metro corridor of Phase 1A of the Lucknow Metro Rail Project. It is a state-of-the-art 220kV/33kV/25kV Receiving Sub Station (RSS) cum Auxiliary main Sub Station cum Traction Sub Station.The RSS will receive power at 220 kV through double circuit underground cables laid from grid sub – station of UPPTCL at Chinhat. Approximately 7.5 kilometers of double circuit of 220 kV EHV cables have been laid by LMRC between Chinhat GSS to Mahila Polytechnic RSS of LMRC.

100% redundancy has been provided through the alternate circuit to improve the reliability. The distribution of the 220kV power to the transformers is through a modern technology of 220kV Gas Insulated Switchgear, which has resulted in substantial reduction in the requirement of the land for the 220 kV yard. Gas Insulated Switchgear has been installed for 25kV traction power distribution also.

33kV indoor type switchgear has also been provided for the auxiliary power supply distribution. Sub Station automation based on Intelligent Electronic Devices (IEDs) has been provided for Control and Protection of substation equipment. Supervisory Control and Data Acquisition System (SCADA) has been provided at the Operational Control Center (located at the Transport Nagar Metro Depot) through which all the power supplies equipment's can be monitored and controlled.

These two Receiving Sub-stations are designed in such a way that they can cater to the traction and auxillary power requirement of whole North-South corridor of Lucknow Metro ie. From CCS Airport to Munshipulia, in case of failure of any of these Sub-Stations.

Delhi Metro Yearender for 2018; India

26 December, 2018 by Team - Rail Analysis India
Team - Rail Analysis India

The year 2018 was a historic year for the Delhi Metro Rail Corporation (DMRC). This year, a record, 86.72 kilometres of new sections were opened by Delhi Metro. E-Rickshaws were also launched from some stations as part of efforts to enhance the last mile connectivity from the stations.

2nd January: The Delhi Metro started the test runs on the Noida – Greater Noida Corridor on 2nd January. The train was flagged off by Dr. Mangu Singh, Managing Director, DMRC and Mr. Alok Tandon, Managing Director, NMRC.

14th March: The Majlis Park – Durgabai Deshmukh South Campus Pink corridor of the Delhi Metro was formally inaugurated for passenger services by the Union Minister of State (Independent Charge) for Housing and Urban Affairs, Sh. Hardeep Singh Puri and the Chief Minister of Delhi, Sh. Arvind Kejriwal in the presence of Union Minister for Science and Technology, Earth Sciences, Environment, Forests and Climate Change, Dr. Harsh Vardhan and many senior dignitaries.

28th May: The 24.82 kilometre long Kalkaji Mandir – Janakpuri West Metro corridor was flagged off on 28th May, 2018 (Monday) by the Hon'ble Union Minister of State (Independent Charge), Ministry of Housing and Urban Affairs, Sh. Hardeep Singh Puri and the Hon'ble Chief Minister of Delhi, Sh. Arvind Kejriwal from the Nehru Enclave Metro station.

24th June: The 11.18 kilometre long City park (Bahadurgarh) – Mundka Metro corridor was flagged off via remote by the hon'ble Prime Minister, Sh. Narendra Modi on 24th June, 2018. Bahadurgarh became the third city in Haryana to be connected by the Delhi Metro.

3rd August: Hon'ble Lt. Governor of Delhi, Shri Anil Baijal flagged off a fleet of 100 e-rickshaws, called SmartE, from Dwarka Sec-10 Metro station to boost the last mile connectivity service in Dwarka sub-city for Metro commuters. These E-rickshaws ply from 8 Metro stations of Dwarka sub-city namely, Dwarka, Dwarka Sec-14, Sec-13, Sec-12, Sec-11, Sec-10, Sec-9 and Sec-8 from 6 AM to 11 PM.

6th August: The 8.10 kilometre long Durgabai Deshmukh South Campus – Lajpat Nagar Metro corridor was formally flagged off on 6thAugust for passenger operations by Sh. Hardeep Singh Puri, Union Minister of State (Independent Charge), Housing and Urban Affairs and Sh. Arvind Kejriwal, Chief Minister, National Capital Territory of Delhi in the presence of the Sh. Anant Kumar, the Union Minister for Chemicals & Fertilizers and Parliamentary Affairs.

16th September: The Delhi Metro introduced QR code based ticketing facility for travel on Airport Express Line from 16th September. With the introduction of this facility, commuter's using Delhi Metro's Airport Express Line can use the QR Code generated on their smart phones instead of smart cards or tokens to travel.

31st October: The 17.8 kilometre long Trilokpuri Sanjay Lake – Shiv Vihar Metro corridor was formally flagged off on 31st October for passenger operations by Sh. Hardeep Singh Puri, Union Minister of State (Independent Charge), Housing and Urban Affairs and Sh. Manish Sisodia, Deputy Chief Minister, National Capital Territory of Delhi.

19th November: The 3.2 km long Raja Nahar Singh (Ballabhgarh) – Escorts Mujesar extension of the Kashmere Gate – Escorts Mujesar corridor (Violet Line) of Delhi Metro was formally flagged off via remote by the hon'ble Prime Minister of India, Sh. Narendra Modi on 19th November, 2018.

Year End Review 2018 – MMRDA; India

28 December, 2018 by Team - Rail Analysis India
Team - Rail Analysis India
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The Mumbai Metropolitan Region Development Authority (MMRDA), in the year 2018, has once again showcased its commitment and intent to undertake many a mega infrastructure projects and paved way forward towards completing them on a war footing. A cursory look at the progress it has achieved in the year 2018 is proof enough of its credibility –

- The two Metro corridors – 18.5-km Dahisar-W to DN Nagar Metro-2A (Rs.6,410 crore) and 16.5-km Andheri-E to Dahisar-E Metro-7 Corridor (Rs.6,208 crore) – are being implemented on a war footing. Both projects are looking at completion of civil construction in 2019.
- The Authority has also begun the construction of the 23.5-km DN Nagar to Mankhurd Metro2B (Rs.10,986 crore) and 32-km Wadala-Ghatkopar-Mulund-Thane-Kasarvadavali Metro-4 Corridor (Rs.14,549 crore). The work on 14.5-km Swami Samarth Nagar-JogeshwariKanjurmarg-Vikhroli Metro-6 corridor (Rs.6,672 crore) has also started this year.
- Very recently, The Authority approved Detail Project Reports (DPRs) for Gaimukh to Shivaji Chowk (Mira Road) Metro-10 (Rs.4,476/- crore), Wadala to Chhatrapati Shivaji Maharaj Terminus Metro-11 (Rs.8,739 crore) and Kalyan-Taloja Metro-12 (Rs.4,132/- crore) corridors. All the three DPRs will now be recommended to the State Government for approval.
- The establishment of Mumbai Metro Operation Corporation Ltd. is another step forward as the State expects to throw open Andheri (East) to Dahisar (East) Metro-7 and Dahisar to DN Nagar Metro-2A corridors next year. The Corporation will be an autonomous body and will deal with operation and maintenance of Metro Lines as also Monorail. In addition, decision to create more than 1,000 posts has also been taken.
- The crucial decision of establishing Project Implementation Unit (PIU) to implement the Multi-Modal Navghar to Belavli corridor was taken in view of the various daunting tasks, such as land acquisition, resettlement and rehabilitation of the project affected families, appointment of contractors, handling legal hassles, coordination with different state and central government entities for various permissions, security arrangement etc.
- The Authority also appointed MMRDA as the Special Planning Authority for the Mumbai University's Kalina Campus. MMRDA is constructing two roads, A 2-km long elevated road connecting BKC and Hans Bhugra marg and the other 690-meter road to facilitate entry/exit from and to Bandra-Kurla Complex, which construction will require some land owned by the University.
- The Chief Minister also released a series of heritage circuit maps covering heritage properties (built/natural) within the Mumbai Metropolitan Region (MMR). The task was commissioned by the MMR-Heritage Conservation Society. These maps represent perhaps the first such attempt to record and make accessible to the public heritage properties and natural sites in the MMR, several of them relatively unknown and neglected.
- The Authority further widened its region by including the entire Palghar Taluka, remaining region of Vasai Taluka, Alibaug, Pen, Panvel and Khalapur in Raigad District in the MMRDA's jurisdiction. This decision will help develop these regions in a planned way. "These areas have tremendous development potential and prone to fast unplanned growth if left as it is. This decision will now see these regions not only develop in a planned manner but also sustain the development on its own", said the Chief Minister. There will be emphasis on development of "Growth Centers", which will work as catalyst for development of the region.
- Hon. Chief Minister also inaugurated the "War-Room and Innovation Center" at MMRDA much on the guidelines of a war-room that is set up in Mantralaya by himself. War Room's need was felt by the Metropolitan Commissioner keeping in mind the large number of projects undertaken by MMRDA. The War-Room will be busy not only to streamline mega projects, discuss and take quick decisions with regard to any and all emergencies, it will also undertake critical research activities to pave way towards "total development" of the city and its metropolitan region.

- MMRDA, in the month of September 2018, successfully restarted the first phase of Monorail from Chembur to Wadala and will start operations of the second phase in the next year.
- MMRDA successfully conducted the bid process and received lowest quotes for coaches, lifts, escalators and auto fare collection machines.
- This year the Authority inaugurated 1.4-km Ghansoli-Talavli flyover and 575-m long flyover from Savita Chemicals towards Belapur. The Bhoomipujan for the 796-m ROB at Kopri, Thane; and 3.5-km Road connecting Thane-Belapur Road was also performed.
- The New MMRDA Logo was launched by the Chief Minister which is indicative of the nature of varied projects the Authority has been implementing in the recent past. “The change in Logo was pertinent in the wake of the changed and enhanced scope of work undertaken by MMRDA over a period of time. It conveys the diverse development activities MMRDA undertakes today and the way forward the Authority has planned”, expressed Mr.Fadnavis.

Besides Metro-2A & 7 MMRDA is looking at completing many other projects in 2019 –

- After taking over the operations of the Monorail, MMRDA has been running it quite successfully and is now aiming completion of phase-2 of Monorail. MMRDA, in the larger public interest, has terminated the contract with M/s. LTSE for their failure to perform and fulfill contractual obligations, in turn, causing great inconvenience to the Monorail commuters. The Monorail is expected to carry many more number of commuters daily once the second phase from Wadala to Sant Gadge Maharaj Chowk is commissioned.
- Nearer home, MMRDA is keen to introduce smart parking in the Bandra-Kurla Complex with the help of RTO and Traffic Police. There will be parking patrolling vans operating within the complex to deter illegal parking which invariably causes traffic chaos in the peak hours.
- There are three more projects that MMRDA has vowed to complete in 2019. The first is 1.6km long Bandra-Kurla-Chunabhatti (EEH connector) of which the estimated cost is Rs.156 crore. This Connector crosses Mithi, LBS road, Central and Harbour Rail tracks to help motorists save 30 minutes and 3-km drive. Motorists will be able to avoid traffic congestion and pollution in Sion-Dharavi area.
- Then there are two flyovers (Estimated cost Rs.163 core) and a road coming up to clear BKC Junction. The total length of the two flyovers – one from BKC to the Sea Link and two Sea Link to BKC is 1,888 meters. Also planned is a 300-meter long and 12 feet wide road running through the government land to streamline traffic from Dharavi to Sea Link.
- MMRDA is also working on a war footing to de-congest BKC and SCLR junctions by constructing two roads at an estimated cost of Rs.449 crore. The 1.3-km elevated road running from MTNL junction to LBS Flyover will clear Bandra-Kurla Complex and another 3.89-km elevated road from Kurla (Kapadia Nagar) to Vakola near Western Express Highway will help decongest SCLR junction.
- Yet another project that MMRDA intends to undertake is improvement of signages on Western and Eastern Express Highway as also in the Bandra-Kurla Complex. While implementing this project MMRDA will pay special attention to the positioning, placement and information on the signages.
- Two other projects that are at final stage are – The 650-meter long Mankoli bridge and 655meter long Rajnli bridge (Rs.121 crore). These two bridges will prove crucial to clearing congestion and road rages at Mankoli and Rajnoli junction on the Mumbai-Nasik National Highway and provide faster connectivity. After terminating the contracts with the contractors for their failure to perform and fulfill contractual

obligations, the new contractors are in the process of being appointed and these two much awaited bridges will be thrown open to public by the end of 2019.

In the year 2019, MMRDA also is looking at undertaking the “Access Control System” to achieve signal-free WEH for which MMRDA will be interacting with consultants in the field. There are suggestions to break down a flyover or two to make the WEH congestion free. The consultants may also suggest a few elevated roads and or underpasses at particular junction. MMRDA is keen to undertake this project

Delhi Government approves much-awaited Phase-IV Project of Delhi Metro; India

20 December, 2018 by Team - Rail Analysis India

Date of Post: 20 Dec, 2018

New Delhi: The Delhi government on Wednesday approved the much-awaited Phase-IV project of the Delhi Metro. In a first, the government has also decided to construct elevated roads under 3 metro corridors – Rithala-Bawana-Narela, Janakpuri West-R K Ashram and Mukundpur-Maujpur — of the total 6 under the 103km long Phase-IV.

Among the projects chosen under Phase-IV are:

- Rithala-Bawana-Narela (21.73 km, elavated)
- Janakpuri West-RK Ashram (28.92 km, 21.18-km elevated)
- Mukundpur-Maujpur (12.54 km, elevated)
- Inderlok-Indraprastha (12.58 km, underground)
- Aero City-Tughlakabad (20.2 km, 5.58-km elevated)
- Lajpat Nagar-Saket G Block (7.96 km, 5.89-km elevated)

More Information:

- The approval, given at a cabinet meeting chaired by Chief Minister Arvind Kejriwal, comes around 2-and-a-half years after it had given in-principle nod to the Phase-IV project.
- The Phase-IV project is expected to be completed by 2024.
- “The cabinet has approved the Phase IV of Delhi Metro. It will boost public transport in Delhi,” Deputy Chief Minister Manish Sisodia said.
- The government would give its share of Rs 9,707 crore towards the construction work under the project, which is estimated to cost around Rs 45,000 crore, Sisodia said.
- The operating losses, if any, would be shared between the government and the Centre at a ratio of 50:50 for the project.
- In the financial year 2018-19 the government will release Rs 1,100 crore, followed by Rs 1,707.50 crore the next fiscal, Rs 1,773.50 crore in 2020-21, Rs 1,731.50 in 2021-22, Rs 16.2 crore in 2022-23 and Rs 1,208 crore in 2023-24.
- The cabinet approved construction of the elevated roads on Rithala-Bawana-Narela, Janakpuri West-RK Ashram and Mukundpur-Maujpur.
- Sisodia said that the corridors will be constructed by the DMRC (Delhi Metro Rail Corporation) and the entire cost would be borne by the government.

To know more about recent developments of Delhi Metro-

04 Dec, 2018: Delhi Metro Update: Dilshad Garden to New Bus Adda corridor of Red Line to open on December 25

29 Nov, 2018: New Subway to connect IGI Airport domestic terminal with Delhi Metro

24 Nov, 2018: PM Modi to Inaugurate Noida-Greater Noida Metro corridor and Delhi Metro's Red Line extension on December 25

**Author:**

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Complete Summary: India's fastest 'Train 18' to be flagged off on 29 December; India

27 December, 2018 by Team - Rail Analysis India
Team - Rail Analysis India

The fastest train from Indian Railways' stable, 'Train 18' will be flagged off by Prime Minister Narendra Modi on 29 December likely from Varanasi, sources said. The country's first engineless train will replace Shatabdi trains and will run between Delhi and Varanasi, the sources said.

- Train 18 recently became India's fastest train by hitting speeds of over 180 kmph during trial-run on a section of the Delhi-Rajdhani route.
- The train will start at 6 am from New Delhi station and is expected to reach Varanasi around at 2 pm, according to the tentative plan.
- In the return journey, train will start at 2.30 pm from Varanasi and reach New Delhi at 10.30 pm on same day.
- Railway Minister Piyush Goyal has recently asked ICF to build 4 more similar rakes in the present financial year.

Train 18 Gets CCRS Clearance for commercial Run

The Chief Commissioner of Railway Safety (CCRS) has given his clearance for the commercial run of India’s first ‘Train-18’, which recently had a successful trial run at speeds of up to 160 kmph. However, the CCRS, while giving the green signal for the launch of the ‘Train 18’, has also recommended the fencing of tracks at vulnerable locations to ensure safety.

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  - “Based on documents submitted, along with the application and inspection and speed trial, the case is being forwarded with recommendation for the sanction of central government for operation of Train-18 up to a maximum speed of 160 kmph on Indian Railways tracks,” CCRS S K Pathak has stated in his order dispatched to the Railway Board on December 21.
  - Taking note of the inspection of the train on December 19 at Safdarjung station in the capital and thereafter a speed trial between Safdarjung and Agra on December 20, the CCRS order has recommended certain precautionary measures like fencing and regular greasing of all the curves on the route.
  - The letter stated,“For speeds beyond 130 kmph and up to 160 kmph, the provision for sturdy fencing all along the track shall be ensured.”
  - The Train 18 is likely to be launched between Delhi and Varanasi on December 29.
  - “For 160 kmph, fencing is a must. But to begin with, Train-18 will be running at a maximum speed of 130 kmph like the Rajdhani service. Once the fencing work is complete, the speed will go up to 160 kmph,” a official said.
  - Rail fencing is essential for 160 kmph speeds to prevent trespassing of people or cattle on the tracks.
  - The Railways had already successfully conducted a speed trial of the Train-18 at the Moradabad and Kota sections.

- During Trials, the train clocked 180 kmph between Kota and Kurlasi on December 2.

Time Line:

Dec 02, 2018: ‘Train 18’ sets new speed record-

India’s first indigenously developed semi-high speed train, known as Train 18, breached the 180 kmph speed limit during a test run on 02.12.2018, a senior railway official said. Manufactured at Integral Coach Factory (ICF) in Chennai, when this Rs 100-crore train is made operational, it will become the country’s fastest train.

- Sudhanshu Mani, General Manager of ICF, said,”Train 18 breached the 180 kmph speed limit in the Kota-Sawai Madhopur section. The major trials are now over, with just some more remaining. Based on the reports, fine tuning would be done if needed. As of now no major technical problem has cropped up.”
- Officials said that the Train 18 is capable of touching 200 kmph provided the rest of Indian Railways’ system such as tracks and signals permit.
- On October 29, the high-tech, energy-efficient, self-propelled (engine-less) train was flagged off in Delhi by Railway Board Chairman Ashwani Lohani.

- With 16 coaches, the train will have the same passenger carrying capacity as that of the Shatabdi Express.
- It has aerodynamically designed driver cabins at both ends for quicker turn-around at destinations.
- The train sports an advanced regenerative braking system which saves power.
- Officials said that the fully air-conditioned train offers better passenger comfort and safety, as all equipment are fixed under the carriage, so that more space is available on board.

Nov 26 2018: ‘Train 18’ successfully runs at 115 kmph

On Nov 26 2018, the trial run of indigenously developed semi-high speed train 'Train 18' was successfully conducted up to 115 kmph on tracks in Moradabad division of Northern Railway, the RDSO (Research Designs and Standards Organisation) said.

"The Train 18 has successfully completed its running and performance trials up to the speed of 115 kmph on nominated track stretches in Moradabad division having defined track geometry parameters, curved alignments of specific radius and station yard zones," M.Z. Khan Executive Director RDSO in a statement said.

The performance of the newly built train has been satisfactory and that the trials are progressing as per the schedule, he said.

Railways will be initiating the process for obtaining necessary approvals from the designated authorities for induction of the Train 18 into commercial service after completion of the trials in Kota division, he said.

Nov 18 2018: First Trial Run conducted successfully

The first trial run of indigenously developed engineless train, the "Train 18" was successfully conducted on tracks at Moradabad-Rampur section of Northern Railways on Nov 18 2018. During the trial run, the train was made to run at different speeds and its breaking was also checked.

Train 18" was first scheduled to set-in-motion on Moradabad-Bareilly section for the first trial. However, due to some blockade on the stretch, the authorities took the decision to change the trial track at the eleventh hour. The train was made to run at 3 different speeds of 30 kmph, 50 kmph and 60 Kmph respectively, according to Railways.

The maximum speed of the "Train 18" is 220 Kmph.

Assistant Operations Manager (AOM), Coaching, DP Singh said,"The train was tested at different speeds during the trial run. An eye was also kept on the functioning of its breaks apart from other parameters over which the train was tested." During its trial run members of various dedicated teams were present.

RDSO (Research Design and Standards Organisation) also created a working desk inside the train to keep a vigil on train speed, jerking and other features, according to officials.

Train 18 – "Made In India" Semi-High Speed Train

Being developed at the Integral Coach Factory (ICF) in Chennai "Train 18" , the country's first engine-less train with a seating capacity of 1128 passengers in 16 coaches/chair cars, comes with super-comfortable seating, automatic doors, vacuum toilets, space for wheelchairs & disabled friendly restrooms.

These trains will have loco pilot cabins on both ends. This will prevent the need to reverse the locomotive which will save time. As these are EMU train sets, the time and distance taken to accelerate and decelerate will reduce, enabling the train to travel at top speed for more distance. Each coach will be fitted with traction motor so the train will be self propelled.

The rake of Train 18 will have 16 coaches consisting of 2 Executive Chair Cars and 14 AC Chair Cars.

History :

It has been the endeavor of Indian Railways to improve the quality of travel for every customer and in this direction the Tejas, Humsafar, Antyodaya and Deen Dayalu coaches have been put into service. Indian Railways plans to turn out state of the art Train18 train sets which will revolutionize rail travel.

A train-set as the name suggests is a self propelled train like the EMU and DEMU stock in service today. It has the inherent advantage of faster acceleration and turn around as compared to a conventional train since no reversal of locomotive is required as there is a driving cab at either end. This initiative by team ICF in the high speed travel will improve passenger satisfaction and help Indian Railways reclaim its modal share in the passenger segment.

Technology :

Driven by a self-propulsion module sans a separate locomotive, the semi-high speed train, comes with technical features for enhanced quick acceleration.

Train 18 will be capable of speeds of upto 160 kmph equivalent of the Gatiman express the only semi-high speed train being run today. The propulsion system will be under slung and all coaches will be inter-connected with fully sealed gangways. This will be run in a 16 car formation consisting of four sets of four cars each. Each electrically powered set will consist of a driving trailer car (DTC), a motor car (MC),a trailer car(TC) and another motor car.

In a configuration of 16 coaches there will be eight motor coaches and this shall ensure faster acceleration. The driving coaches will have a seating capacity of about 44 whereas the trailer coaches will seat 78. The first class executive class shall have 56 seats.

The FRP based aerodynamic profile will ensure energy efficiency. The bogies will have fully suspended traction motors and wheel mounted disc brakes. The train will be very safe with centralized electro-pneumatic brake system with bogie control. The coaches and toilets will have space for wheelchair and access for persons with reduced mobility (PRM).

ICF has developed this technology with the help of European partners. It has a potential to travel up to the speed at 160 kmph as against 130 kmph of Shatabdi and would result in the travel time being reduced by around 15% once the tracks are fit to suit Train 18's speed.

Features :

The Train-18 have features which Include-

- Inter-connected fully sealed gangways
- Automatic doors with retractable footsteps
- Onboard Wi-Fi and infotainment
- GPS-based passenger information system
- Modular toilets with bio-vacuum systems
- Rotational seats which can be aligned in the direction of travel (available only in the executive class)
- Roller blinds
- diffused LED lighting
- Disabled-friendly toilets

The footstep in a coach's doorway slides outward when the train stops at a station enabling passengers to alight safely with comfort in view of the variation in height between a train's floor and the platform.

About Integral Coach Factory (ICF), Chennai

Integral Coach Factory is a premier Production Unit of Indian Railways manufacturing railway passenger coaches. ICF is versatile in manufacturing coaches for main line, suburban, metro, self propelled, luxury, special purpose coaches like Emission Test Car, accident relief train etc.

ICF is World's No.1 coach manufacturer in terms of quantity and varieties of coaches made so far with over 55000 coaches in more than 500 variants passing through the portals of ICF. ICF's USP covers design, development, manufacture and design validation of various types of coaches for Indian Railways, non-Railway customers and for export.

Today, the coach factory produces more than 2500 coaches of more than 50 variants in a year. ICF has started manufacturing stainless steel coaches in a big way. Coaches for Kolkata Metro, DEMU and EMU train sets are also made out of stainless steel. ICF has also been foraying into exports and adoption of cutting edge technology.

ICF has exported large number of coaches to Afro-Asian countries, including Diesel Electrical Multiple Units recently to Sri Lanka. Self propelled Diesel Train sets and Electric Train sets with 3-phase state-of-the-art technology are currently under manufacture.

All Image Credit: ICF

PART II: ACTIVITIES FOR URBAN MOBILITY SOLUTIONS INTERNATIONAL

Metrobus; Istanbul, Turkey

From Wikipedia, the free encyclopedia

Overview	
Locale	Istanbul
Transit type	Bus Rapid Transit (BRT)
Number of lines	1
Number of stations	45
Daily ridership	800,000 [1]
Website	Metrobus
Operation	
Began operation	2007
Operator(s)	IETT
Number of vehicles	334 [2]
Technical	
System length	50 km (31.1 mi)

Metrobus (Turkish: *Metrobüs*) is a 50 km (31.1 mi) bus rapid transit route in İstanbul, Turkey with 45 stations which follows the city's ring-road via Avcılar, Zincirlikuyu and the Bosphorus Bridge to Söğütlüçeşme using dedicated bus lanes for much of the route.[3]

The busway, the first section of which opened in 2007 after two years of construction, is used by a number of Metrobus lines which operate within this ‘closed’ system carrying 800,000 people daily. The Turkish authorities have since assisted with the development of a similar system in Lahore, Pakistan, which opened in 2013. The name Metrobüs was coined by the transit agency to suggest that this system is a hybrid between a metro train (Turkish: *metro*) and a bus (Turkish: *otobüs*).

Lahore Metrobus; Pakistan

From Wikipedia, the free encyclopedia
Jump to navigationJump to search

Lahore Metrobus
لاہور میٹرو بس

PUNJAB MASSTRANSIT AUTHORITY
Government of The Punjab

Overview	
System	Lahore Metrobus
Operator	Punjab Mass Transit Authority
Began service	11 February 2013

The **Lahore Metrobus** (Urdu: لاہور میٹرو بس) is a bus rapid transit service operating in Lahore Punjab, Pakistan.[3] Lahore Metrobus service is integrated with Lahore Transport Company's local bus service to operate as one urban transport system, providing seamless transit service across Lahore District with connections to neighboring suburban communities. The Lahore Metrobus was designed to be opened in stages, with the first stage opening on 11 February 2013 stretching from Gajumata to Shahadra. The 27 km stretch was opened during a ceremony by Punjab Chief Minister Shahbaz Sharif along with Deputy Prime Minister of Turkey Bekir Bozdağ. The second and third stages have been put on hold, as proposals have been put forth to convert the remaining stages to light rail. The Orange Line of the Lahore Metro was initially planned as a BRT.

History

Lahore Transport Company was established in 1984 to ease the traffic conditions of Lahore and improve bus services. LTC got all the transport responsibilities of traveling in Lahore in December 2009. A BRTS fleet of 650 Buses was introduced. It was given name "Lahore Bus Company". However, the BRTS did not have dedicated lanes and had to share roads with regular traffic with no right of way privileges. This resulted in a system that was a BRTS only in name.

Planning

After 20 years of discussion, the ambitious Lahore Metro, which had first been proposed in 1991 was abandoned in favour of a bus transit system, inspired by the successful TransMilenio of Bogotá, Colombia and Istanbul Metrobus system. Plans were developed in the last quarter of 2011 by both local and Turkish experts.

Construction

Construction of the project was divided into different packages and was awarded to different contractors. Given to Haji Muhammad Aslam (HMA) and sons crange, for all major heavy steel and pillar work this also included digging into the ground to develop the foundations of the project, and M/s Zahir Khan & Brothers in Joint venture with M/s Reliable Engineering Services (Pvt.) Limited constructed the Flyover part including two elevated rotaries for BRTS.Habib Construction Services construct the down ramp to taxali gate of flyover.[4] Construction project started in March 2012 and buses entered service in February 2013. The system, which was constructed by the Traffic Engineering and Planning Agency (TEPA), a subsidiary of the Lahore Development Authority (LDA) at a cost Rs 29.65 billion.[5] The system was built on the build–operate–transfer basis via the collaboration between the Punjab and the Turkish government.

The system was inaugurated by Punjab, Chief Minister, Mian Shahbaz Sharif on February 11, 2014, in a ceremony attended by Turkish Deputy Prime Minister Bekir Bozdağ, Prime Minister and PML-N ex-chief Nawaz Sharif, as well as ambassadors from a number of other countries. The Mayor of Istanbul, Kadir Topbaş, also announced a gift of 100 buses.[6] It is Pakistan's first bus rapid transit system.

Operation

Lahore MBS currently operates a fleet of 66 buses. The buses run on a single 28.7 km long Ferozepur Road corridor with two other corridors being planned. Buses on the current route have an average speed of 26 km/h.[7] The system uses e-ticketing and Intelligent Transportation System wand. System operations are managed by the Punjab Metrobus Authority (PMBA), though IT services are handled in coordination with Punjab IT Board.

Following the initiation ceremony, use of the system was to be free during the first month. However, following a week of chaos and overcrowding, a fare of Rs. 20 (US$0.2) was imposed irrespective of the destination.[8]

According to the Lahore Transport Company, the daily ridership of the Metrobus exceeds 180,000[1] with the peak hourly ridership being 10,000 passengers per hour per direction (p/h/d). Studies conducted by the transport company claim that this figure will increase by

222% to 20,000 p/h/d in 2021.[7] To keep the cost affordable for everyone Punjab Government has to pay Rs 40 as subsidy on each Re 20 ticket.[9][10][11]

Design

The Lahore **Metrobus** meets the criteria laid out by the Institute for Transportation and Development Policy. It has barrier-controlled, automated off-board fare collection, a service interval of less than 2 minutes during peak hours, stations with well-designed signage and information systems and a precision bus docking system (See: *Guided Bus*). The terminal approach system has escalators and underground, subway-styled approach tubes. Due to these approach tubes, prospective passengers don't have to cross high-speed roads to get to the stations, but go below them instead, an example of a segregated Right-of-way.[12] The stations have parking spaces for motorbikes and cycles while the two terminals provide car-parking facilities as well.[13]

Each Company in Lahore Metro Bus Project received Rs1bn per Kilometer; Pakistan

Mahnoor Sheikh (@mahnoorsheikh03) 9 months ago Fri 20th April 2018 | 12:59 PM

Journalist reveals NAB has received all the records of payments made to several companies in Lahore Metro Bus Project

Lahore (UrduPoint / Pakistan Point News - 20th Apr, 2018) Senior journalist Chaudhry Ghulam Hussain while talking on a tv program has said that NAB has received all the records of payments made to several companies in Lahore Metro Bus Project.

Hussain said that investigation sources in NAB reveal that the companies were paid Rs 1 billion per kilometer.

He said that it is the same project that was being praised.

Only four firms in Punjab get these contracts, including a firm by Alam Khan, Habib Construction Services, Waseem Afzal, Zahir Khan and Reliable Company.

New Taipei light Rail Line opens; Taiwan

Dec. 27, 2018

Written by Keith Barrow

TRIAL passenger operation began on the first phase of the Danhai light rail network in New Taipei on December 24 with a month of free rides on the 7.3km Green Mountain Line.

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Delhi opens Pink Line extension
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Great Western electric operation extends west
Dec 31, 2018 | Infrastructure

The 11-station line connects Hongshulin station on the Taipei Metro Red Line with Danhai New Township.

During the initial phase of operations trams are running at 15-minute headways between 06.30 and 22.00.

Services are operated by a fleet of 15 Warrior trams built by Taiwan Rolling Stock Company (TRSC).

The LRVs, which are the first modern light rail vehicles to be built in Taiwan, were developed for TRSC by Voith Engineering Services at its Competence Centre for Rail Vehicle Development in Chemnitz, Germany.

Each 34.5m-long five-section bidirectional vehicle accommodates 265 passengers and has a maximum speed of 70km/h.

A three-station branch to Danshui Fisherman's Wharf, which will be known as the Blue Ocean Line, is due to open next year.Categories: AsiaLight RailNews

METRO NEWSLETTERS
on
URBAN MOBILITY

PUBLIC MULTIMODAL URBAN, SUBURBAN AND INTERURBAN PASSENGER TRANSIT SYSTEMS WITH METRO-BUS, LIGHT-RAIL, METRO-RAIL, REGIONAL RAPID TRANSIT, COMMUTER-RAIL, ROPE-WAY/TRAIN, WATER-METRO, AUTOMATED PEOPLE-MOVER

TRANSPORTATION AND ECONOMIC DEVELOPMENTS IN MODERN URBAN/MEGAPOLIS ENVIROMENT

METRO Newsletter by Dr. F.A. Wingler
METRO 21, December 2019

Commuter Rail Mumbai, India

PART I: ACTIVITIES FOR URBAN MOBILITY SOLUTIONS IN INDIA

Second driverless Line takes Delhi Metro over 250 km; India

15 Mar. 2018

INDIA: Passenger services on the first phase of Delhi metro Line 7 began on March 14, taking the city's network to 252 route-km with 185 stations.

The route between Majlis Park and Durgabai Deshmukh South Campus is 21·6 km long with 12 stations. When completed, Line 7, also known as the Pink Line, will form a 58·4 km U-shaped route from Mukundpur to Shiv Vihar.

Services are operated with six-car driverless trainsets supplied by Hyundai Rotem. The Rs41·8bn order placed in 2013 covers 52 six-car trains for Line 7 and 29 six-car trains for Line 8.

The first 12·6 km section of Line 8 was inaugurated on December 25. As with Line 7, Line 8 is being built as part of the metro's Phase III expansion programme. To date 62 km of Phase III has been opened, with 98 km still to come.

Related news

- 02 Jan 2019 - Seventh Delhi metro extension of 2018 opens
- 20 Nov 2018 - Delhi metro Violet Line extension inaugurated
- 01 Nov 2018 - Next phase of Delhi metro Line 7 inaugurated
- 08 Aug 2018 - Next phase of Delhi metro Line 7 opens
- 25 Jun 2018 - Delhi Metro Green Line extended
- 29 May 2018 - Line 8 completed in Delhi
- 26 Dec 2017 - Modi inaugurates Delhi orbital metro line
- 22 Dec 2017 - Test running begins on Delhi metro's Bahadurgarh extension
- 30 May 2017 - Delhi Metro opens heritage corridor extension
- 20 May 2016 - Delhi Metro presents driverless train

Seventh Delhi Metro Extension of 2018 opens; India

02 Jan. 2019

INDIA: The next phase of Delhi metro's driverless Line 7, also known as the Pink Line, was opened for passenger service on December 31.

The 9·7 km section between Lajpat Nagar and Mayur Vihar Pocket 1 with three underground and two elevated stations is the fourth section of Line 7 to open, and comes two months after the Shiv Vihar – Trilokpuri Sanjay Lake section was inaugurated. Line 7 will eventually form a 58·4 km U-shaped route from Mukundpur to Shiv Vihar.

Delhi Metro Rail Corp says that this is the seventh metro opening in the capital in 2018, with 96 km of new sections opened during that year. This takes the metro to 327 km and 236 stations.

Related news

- 20 Nov 2018 - Delhi metro Violet Line extension inaugurated

- 01 Nov 2018 - Next phase of Delhi metro Line 7 inaugurated
- 08 Aug 2018 - Next phase of Delhi metro Line 7 opens
- 25 Jun 2018 - Delhi Metro Green Line extended
- 29 May 2018 - Line 8 completed in Delhi
- 15 Mar 2018 - Second driverless line takes Delhi metro over 250 km

All Transport Projects in Mumbai to be completed by 2022 including Underground Metro, elevated Suburban Trains & New Airports; India

29 January, 2018 by Rohit Kumar
Rohit Kumar

Date Of Post: 29 Jan, 2018

Mumbai: Confident of finishing all transport projects in Mumbai by 2022, Maharashtra Chief Minister Devendra Fadnavis has said the city will see a transformation in terms of mobility with projects ranging from underground metro and sea bridge to coastal roads, elevated suburban trains and new airports.

Image Credit: Mintu500px – Wikimedia Commons

Scope In Manufacturing Sector-

- There is a huge scope for all industries in the manufacturing sector in the state and the services industry is also growing very fast, Fadnavis who was in Davos to attend the World Economic Forum (WEF) Annual Meeting and promote Maharashtra as an investment destination for global businesses, said.

- Fadnavis said,"Now the focus is also on Industry 4.0 or the Fourth Industrial Revolution sectors such as artificial intelligence, innovations, startups and big data analytics. These will change the face of how the businesses look today and they will create jobs. One of the big focusses is Industry 4.0."
- His government was working on creating an IFSC (International Financial Services Centre) in Maharashtra and he was confident to be able to do that, he also said.
- The CM said,"Mumbai is the natural financial services centre. Besides, Maharashtra is preparing the country's first fintech policy which we will publish in coming days. The future is Fintech or financial technology and I feel Maharashtra can lead on this front."

Image Credit: arzankotval2002 – Flickr

All Projects To Be Completed By 2022-

- Fadnavis, on various infrastructure projects underway for Mumbai, said all projects will start getting delivered from next year itself and would be completed fully by 2022.
- "These include 258 km of metro network in Mumbai and suburban areas, which would be one of the biggest in the country. About 50 km of elevated suburban railway network is being set up. We are also making coastal roads. a new sea link, a sea bridge from Mumbai to New Mumbai, an airport in New Mumbai is coming up, an underground metro is there and on eastern coast there will be RoRo service. So these are projects of all modes of transport," he said.
- He said,"There is a new airport for Mumbai and the work has begun already. Among all these, work has begun on almost all major projects and there are a few for which we will issue work orders this month itself or maybe next month."
- There is no single project that is still at conception stage, Fadnavis said.

- “By 2022, I will beat the rate of urbanisation in terms of mobility in Mumbai.”

PART II: ACTIVITIES FOR URBAN MOBILITY SOLUTIONS INTERNATIONAL

FTA grant for Portland, Oregon, Streetcar Study; USA

- January 02, 2019
- Light Rail, News, Passenger

Written by Stuart Chirls, Senior Editor

Image: Portland Streetcar

A Federal Transit Administration grant will help a Pacific Northwest city study expansion of its streetcar network.

The $1.076-million requested grant underwrites assessment of development opportunities along the proposed 2.3-mile extension to Montgomery Park in northwest Portland, Ore.

The city is eyeing changes to zoning laws, to attract mixed-use development, and other aspects of the project including redevelopment of the 24-acre site of a demolished steel mill.

The three-year project is estimated to cost $80 million, including new rolling stock and a maintenance facility. The expansion would also double the frequency of service to the city’s Rose Quarter and Convention Center.

Categories: Light Rail, News, Passenger Tags: Breaking News, Federal Transit Administration, Portland Streetcar

- January 02, 2019
- Commuter/Regional, News, Passenger, Rapid Transit/Light Rail

Chicago O'Hare People Mover to close until Fall as Renovations take Place; USA

- January 02, 2019
- Commuter/Regional, News, Passenger, Rapid Transit/Light Rail

Written by Kyra Senese, managing editor

Chicago officials are urging commuters who rely on the O'Hare International Airport "People Mover" to use the Chicago Transit Authority's Blue Line while the People Mover undergoes improvement work. | Photo: The Chicago Transit Authority's Damen Blue Line. Credit: CTA Web on Flickr

The O'Hare International Airport "People Mover," the light-rail system that shuttles passengers around the airport grounds, will shut down completely next week and will not reopen until the fall of 2019, according to a Dec. 31 Chicago Tribune report.

The people mover, also known as the Automated Transportation Service (ATS), has not operated during weekdays since the spring. The report states that beginning at 5 a.m. on Jan. 8, weekend service will be suspended and shuttle buses will be relied upon until train service picks up again in the fall.

"The [Chicago Department of Aviation] is building a new and improved ATS that will benefit O'Hare travelers moving between the terminals, economy parking lots and the new Multi Modal Facility," said Chicago Department of Aviation (CDA) Commissioner Jamie L. Rhee in a press release. "We recognize that construction on the new ATS may inconvenience passengers, and so we are urging them to plan ahead and consider alternative travel options to avoid extra traffic. Working with the CTA and our airport partners, we are encouraging travelers to choose the Blue Line to save time as we work to elevate the travel experience from O'Hare."

The city of Chicago is upgrading the airport's 25-year-old people mover to include a new, larger fleet of cars. The Tribune reports that the new fleet will double the people mover's capacity.

Lauren Huffman, deputy commissioner of Communications at the CDA, reportedly told the Tribune that the ATS train system needs to shut down because it is electrical and crews will be working on the tracks. The previous system transported 30,000 passengers per day on average, she said.

In addition to moving passengers between terminals and economy parking lots, the new system will also feature a new stop at the O'Hare Multi Modal Facility, which the Tribune reports was completed last fall. The facility was designed to offer a central access point for rental cars and parking.

The People Mover shutdown is expected to cause additional vehicle traffic surrounding the terminal roadways at O'Hare. The city's aviation department is encouraging passengers to use the Chicago Transit Authority (CTA) Blue Line for less congested transportation to and from the airport when possible.

The city has included the renovation of the people mover in the $841 million cost for the Multi Modal Facility, the report stated. Finances for the project included a federal loan as well as general airport bond revenues, the city explained.

Categories: Commuter/Regional, News, Passenger, Rapid Transit/Light Rail
Tags: ATS, Automated Transportation Service, Chicago Department of Aviation, Chicago Transit Authority, CTA, light-rail system, O'Hare International Airport, people mover, shuttle

Hyundai Rotem nets Cairo Metro Train Contract; Egypt

Jan. 3, 2019

Written by Kevin Smith

EGYPT's National Authority for Tunnels has awarded Hyundai Rotem a Won 150.8bn ($US 130m) contract to supply 48 metro trains for Cairo Line 2.

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Delivery is scheduled to be completed by 2021 while maintenance will be provided until 2031. The 80km/h trains will use a 750V dc third rail power supply and air conditioning to provide a more comfortable ride in the Egyptian heat.

The Korean manufacturer has supplied rolling stock for Line 1 and also won a contract in 2017 to deliver 256 cars for Line 3 by 2025.

Categories: AfricaFleetMetrosNews
Tags: CairoEgyptHyundai Rotem

Two more Moscow Metro Stations opened; Russia

04 Jan. 2019

RUSSIA: A 1·8 km extension of Moscow metro Line 11 opened on December 30, running east from Petrovsky Park to Savyolovskaya.

When completed in 2023, Line 11 would form a 69 km circular route incorporating the existing 3·3 km line between Kashirskaya and Kakhovskaya. The Delovoy Tsentr – Khoroshyovskaya section would then be operated as a branch, before becoming part of the future of Line 13 in 2025.

- Moscow Mayor Sergei Sobyanin inaugurated Belomorskaya station near the northern end of Line 2 on December 20.

Related news

- 31 Aug 2018 - Moscow metro Line 8A extension inaugurated
- 22 Mar 2018 - Moscow metro reaches Seligerskaya
- 26 Feb 2018 - Next section of Moscow metro Line 11 opens
- 03 Jan 2018 - Moscow metro reaches Khovrino

China, Metro, Projects

Chongqing Metro adds two Lines; China

04 Jan. 2019

CHINA: Two metro lines opened in Chongqing on December 28.

The northern part of the Loop Line is 33·7 km and connects Chongqing Library with Haixialu via Chongqingbei Railway Station. There are 24 stations, of which seven are due to open in 2019.

The Loop Line crosses the River Yangtze on the 1·7 km Chaotianmen Bridge, which opened to road traffic in 2009. The metro tracks are on the bridge's lower deck and feature the first use of synthetic sleepers on a Chinese metro.

Services are operated with six-car trainsets with a maximum speed of 100 km/h. All stations have provision for seven-car sets. When complete, the Loop Line will be 50·1 km long.

The other line to open is the 15·4 km Line 4, which serves eight stations between Chongqingbei Railway Station and Tangjiatuo. This line also uses six-car trainsets.

A 2·5 km extension of Chongqing metro Line 5 had opened on December 24.

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- 28 Dec 2018 - Xi'an opens second north-south metro line
- 27 Dec 2018 - Qingdao opens coastal metro Line 13
- 24 Dec 2018 - Chongqing opens Line 5 extension

- 03 Jan 2018 - Chongqing adds two metro lines

First CAF LRV in Service on Boston Green Line; USA

03 Jan. 2019

USA: The first of 24 light rail vehicles that CAF is supplying to Massachusetts Bay Transportation Authority's Boston Green Line entered regular passenger service on December 21.

The 70% low-floor LRVs, designated Type 9 by MBTA, were ordered under a $118m contract signed in 2014. CAF has produced the bodyshells in Spain, with final assembly and testing at its plant in Elmira, New York, to comply with Buy America regulations.

All 24 LRVs are scheduled to be in service by late 2019. With a passenger capacity 10% greater than the LRVs currently in service on the Green Line, the new vehicles are expected to increase overall capacity on the route. They are also needed for the extension to Union Square and College Avenue. A groundbreaking ceremony for the extension took place in June 2018, and opening is planned for late 2021.

Related news

- 02 Jan 2019 - First CRRC metro cars assembled in Springfield delivered to Boston
- 04 Jul 2018 - Boston Green Line extension breaks ground
- 22 Nov 2017 - Boston Green Line light rail extension contract awarded
- 16 May 2014 - CAF wins Boston Green Line order

Guangzhou adds suburban Metro Lines; China

03 Jan. 2019

CHINA: Two suburban metro lines opened in Guangzhou on December 28, and one metro line was extended. The main section of Line 14 runs for 54·4 km between Jiahewanggang and Dongfeng in the northeast of the city, serving 13 stations. At Xinhe the Knowledge City Line branches off. Opened exactly one year previously, this now becomes a branch of Line 14.

Stopping services operate every 7 min and express services every 35 min. CRRC Zhuzhou has supplied 30 Type B trainsets, which were assembled in Guangzhou. The fleet is stabled at a depot at Dengcun and in sidings at Shihu.

The 26 km Line 21 serves nine stations between Zhenlongxi and Zengcheng Square via Zhenlong, where interchange is provided with the Knowledge City branch of Line 14. Like Line 14, Line 21 is designed for 120 km/h operation and uses a mix of stopping and express services. CRRC Zhuzhou has supplied 33 locally assembled Type B trainsets.

A 35·4 km western extension of Line 21 between Zhenlongxi and Yuancun is scheduled to open in late 2019.

A 5·4 km eastern extension of the interurban Guangfo Line was also inaugurated on December 28, adding three stations between Yangang and Lijiao. An extension at the other end is also planned.

Related news

- 04 Jan 2019 - Chongqing metro adds two lines
- 03 Jan 2019 - Beijing metro lines 6 and 8 extended
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- 28 Dec 2018 - Xi’an opens second north-south metro line
- 27 Dec 2018 - Qingdao opens coastal metro Line 13
- 24 Dec 2018 - Chongqing opens Line 5 extension
- 22 Nov 2018 - Six more metro projects launched in Guangzhou
- 27 Apr 2018 - Tianjin and Guangzhou metro extensions inaugurated
- 29 Dec 2017 - Four lines open as Guangzhou metro expands

The Winners and Losers of Russian Metros; Russia

14 Sep. 2018 | by **Vladimir Waldin**

Photo: Vladimir Waldin

The 2018 FIFA World Cup highlighted some sharp contrasts between Russia’s metro networks.

The role of metros in carrying spectators during the 2018 FIFA World Cup in Russia ranged from that of a midfield lynchpin in some host cities to fringe player elsewhere. Of the 11 host cities, six have metro networks, and it is no surprise that passenger numbers grew significantly at stations near World Cup venues.

In Moscow the average daily increase across the network was 300 000 passengers, in St Petersburg it was around 100 000 and Nizhny Novgorod doubled its regular daily patronage to more than 220 000 passengers on match days. Travel was free for holders of

Fan IDs; in Moscow fans, journalists and volunteers used the metro an average of seven times a day, and one correspondent set a record by making 216 trips during the tournament. Moscow also pioneered live streaming of matches on board trains.

The success of these three cities follows from having stations near World Cup venues. Some were built specifically for this purpose. St Petersburg gained two stations on a 5 km extension of Line 3 that opened on May 26. Novokrestovskaya, built to serve the stadium, can handle up to 30 000 entering passengers/h. The city also put new rolling stock into service. In Nizhny Novgorod a 2·5 km extension opened on June 12 to serve the stadium. Both projects obtained central government funding: St Petersburg received 14bn roubles of the 37bn rouble cost and Nizhny Novgorod received 6bn roubles towards its 11bn rouble project.

Other host cities were not so lucky. Despite applying for federal funding, Kazan, Samara and Yekaterinburg received no central government money to extend their single-line metros. The World Cup venues in those cities were too far from metro stations for most spectators, who used other modes to visit them.

Since 2010 the federal government only provides funds for metro construction in connection with international sporting events. The only exception has been a 2·9bn rouble grant for Nizhny Novgorod as part of historical celebrations in the city. Aside from the World Cup, sport-related metro projects include a three-station extension in Kazan ahead of the 2013 Summer Universiade, for which the city received 10·5bn roubles.

Novosibirsk could receive federal funding towards a planned extension that would serve a stadium to be used in the 2023 World Junior IIHF Championships. Novosibirsk is the only Russian city with a metro that did not host any World Cup matches.

Costs and Funding

Under Russian law, metros are municipal enterprises, and therefore only local authorities can invest in them. A loophole that allows exceptions will soon be closed when a new law enters into force; this has already been passed by both houses of parliament, and is awaiting presidential approval.

This approach marks a change from Soviet times, when the central government would fund all metro capital costs. With the transition to a market economy in the early 1990s, local governments were expected to contribute, and the central government's share was lowered to 80%, then to 50% in 1996 and 20% in 2002. In practice, the shares hardly ever reached these levels. For instance, they formed 6% of Moscow's construction costs in 2009, and St Petersburg received 7% to 15% between the early 1990s and 2008. Federal funding for smaller networks could still occasionally reach 50% so that work which had already been started could be completed.

All seven metro networks in Russia were designed to the same technical standards. The only principal difference is in platform lengths, which are able to accommodate trains of between five and eight 19·2 m cars. Most were built as twin tunnels with island platforms. Sub-surface sections date from the 1960s, and above-ground and elevated alignments remain rare, often having been built as experiments.

Tunnels, including stations and depots, cost an average of 10bn to 15bn roubles per route-km to build, with construction of an extension lasting five to six years. Cut-and-cover methods can save 2bn to 5bn roubles and up to three to four years. Additional savings could be made by using double-track bored tunnels, which first appeared in 2014-15 in St

Petersburg, along with top-down station construction. At some stations in Moscow, platform arrangements are being introduced with a platform on each side of a single track so that boarding and alighting passengers do not use the same platform; this leads to a 15% to 30% saving on the overall construction cost.

Final costs vary with other factors such as ground conditions, but it is obvious that the price is steep even for the larger regions, which still have annual budgets of less than 200bn roubles.

Some Networks expanding

With an official population of 12·4 million in 2017, Moscow is the largest city, and its 12-line network remains the country's most extensive. It is also the only one that is meaningfully developing. Despite the economic difficulties of the 1990s, its expansion was never interrupted. It had reached 311 route-km with 187 stations in 2012, when Mayor Sergei Sobyanin announced a 1tr rouble programme to build 150 route-km and 78 stations by 2020. So far 70 km and 34 stations have been built.

In 2017 Moscow spent more than 150bn roubles on metro construction, and in 2018 the figure reached 384bn roubles. In October 2017 the mayor's office agreed the final part of the revised funding package, covering 2018-20, valued at 2tr roubles.

By September, 54 km of tunnels and 34 stations were under construction, engaging around 50 000 workers and 33 tunnel boring machines. In a first for the country, a metro construction contract was awarded to a foreign firm in early 2017. Under a 23bn rouble package, China Railway Construction Corp is building a 3·6 km section of Line 11 with three stations, which is due to open in 2019. Meanwhile, ridership fell from 2·6 billion passengers in 2006 to 2·38 billion in 2016, even though 35 stations were added. It started to grow slowly again in 2017, when it totalled 2·44 billion.

The second-largest network is in St Petersburg, with 118 km and 69 stations, and a further seven stations under construction. Work on a sixth metro line appears to be stuck because of funding and land acquisition issues. Several extensions are planned, but funding remains uncertain.

The city's total annual budget is around 550bn roubles. Its 120·7bn rouble transport plan for 2018 includes much roadbuilding, with metro projects limited to 27bn roubles including the World Cup extension funding. Financing for further expansions could be restricted, in the light of more general budget concerns as well as an absence of approved projects, although up to 50bn roubles per year for metro construction is often talked about.

Ridership is steadily decreasing from a peak of 836 million passengers in 2008 to less than 727 million in 2017. This is despite five new stations opening. So even though some areas are more than 30 min from a metro station, a larger network might not add passengers, and only increase operating costs.

Russia's other five metros are much smaller, with between nine and 15 stations each. Only two consist of more than one line: Novosibirsk, carrying 80 million passengers per year, and Nizhniy Novgorod with just over 30 million passengers.

Kazan's metro was the most recent to expand, adding a one-station extension in August, but further plans are in limbo. Despite the much-discussed start of preparatory work for a second line, the draft of the city's new master plan does not include any further metro building until 2035, but focuses on light rail instead. The other cities may face funding difficulties. The only work taking place is in Samara, where builders are hastily adding exits at Alabinskaya station, which opened a few years ago.

Development of the smaller networks is further hindered by low ridership, with revenues covering less than half of operating expenses. Kazan, Nizhny Novgorod and especially Samara all have annual ridership of less than 2 million passengers per km. The figure could rise if planned extensions are built, but their completion seems unlikely in the foreseeable future. In the meantime, headways have lengthened to 10 or even 20 min off-peak, which further discourages passengers and creates a vicious circle.

Construction of initial metro lines in Krasnoyarsk, Omsk and Chelyabinsk began 2011-14, but in all three cities work was suspended shortly after it started. However, the tunnels that were bored necessitate support for structures above them. Krasnoyarsk spends up to 80m roubles annually on this, Chelyabinsk 1·3bn roubles and in December 2017 Omsk received 800m roubles from the regional budget towards such works. The three municipalities are thinking about using the completed tunnel sections for fast tram services.

Plans for metros in Rostov-na-Donu, Perm and Ufa were cancelled at the preliminary design stage.

Rolling Stock

Fleets across the country consist of three generations of rolling stock. The majority date from the 1970s, whereas designs from the 1990s are used in Moscow and Kazan and even more recent designs operate in Moscow and St Petersburg.

The Moscow fleet is made up of more than 5 600 cars forming almost 700 trainsets, maintained in 18 depots (a further four are planned). The St Petersburg metro is operated with just over 1 800 cars stabled in six depots, with a seventh used as a maintenance facility.

The smaller networks count between 62 and 130 cars in four-car formations. The exception is Kazan, which has 20 Kazan cars in four-car formations and 27 articulated Rusich cars operated as three-car sets.

Metrowagonmash remains the largest rolling stock supplier. The Transmashholding subsidiary's main factory is in Mytishchi, and it also uses the facilities of OEVRZ in St Petersburg and TVZ in Tver. All export orders are fully or mostly produced at its main factory.

Neva trainsets for St Petersburg are manufactured by the Vagonmaš joint venture of Škoda Transportation and Kirovsky Zavod (this has no connection with the St Petersburg-based Vagonmash that went bankrupt in 2013).

Most components are sourced domestically. Some rolling stock in Kazan and St Petersburg uses components that have been imported or designed jointly with Czech partners. The Oka trains in Moscow and the Rusich trains in Kazan make use of Alstom designs and electrical equipment, and the Yubileyny trains in St Petersburg, as well as Rusich trains exported to Bulgaria, are powered by Hitachi traction motors.

In March Moscow announced that it would award a 51·2bn rouble contract for 74 eight-car MWM Moskva trainsets plus maintenance. To be delivered in 2018-19, these would replace the oldest E stock, and provide extra trains for the recent and coming extensions. Beyond this order, 40 more trains are expected to be ordered by 2020.

St Petersburg received 354 new cars in 2016-18 which run in six-car formations on Line 3. The city plans to buy several hundred more cars by 2027 to replace the eight-car fleet on Line 1.

Another recent customer was Nizhny Novgorod, which received 23 cars in 2017 to boost the existing fleet and operate an upcoming extension.

Few other cities are planning rolling stock acquisitions. The exception is Samara, which is to receive several second-hand Rusich trainsets from Moscow free of charge this year so that older rolling stock can be replaced.

Automation speeds up Metros; Paris, France

07 Feb.. 2018 | by **Alon Levy**

Paris Metro Line 1 was automated in 2007-12, resulting in an average Speed Increase.

This Metro runs with guided inflated rubber tires on a carriage way.

The benefits of automated metros are well-known, apart perhaps from the higher speeds that automation brings.

Driverless metros, which are becoming increasingly common around the world, generally have low operational labour costs as well as high passenger capacity. But automation also has a lesser-known advantage: speed. Not only can computer-controlled trains drive more closely together, but they are also faster. The difference appears to be substantial, perhaps as much as 20 sec per station.

The biggest determinant of average metro speed is the station spacing, with those further apart allowing higher average speeds. However, driverless lines are fast even taking this into account. London Underground stations have a mean distance of about 1·25 km between them, and trains reach an average speed of 33 km/h. The Tokyo metro has the same inter-station distance and an average speed of around 30 km/h. In contrast, the driverless København metro has a scheduled average speed of about 35 km/h, with only 1 km between stations. Vancouver's SkyTrain is also fast for its station spacing: the Expo Line averages 45 km/h with 1·5 km between stations, while the Canada Line averages 35 km/h with 1 km.

It is not just metros built as driverless that are fast. Paris metro Line 1 opened in 1900. With a minimum curve radius of 40 m and an average of 700 m between stations, it could never achieve a high average speed. Following the line's automation, carried out in 2007-12, the average speed rose from 24·4 km/h to 30 km/h. Dwell times are rigidly set at 30 sec, and the timetabled average speed of 29 km/h is close to the theoretical maximum that can be achieved with the station spacing, based on current rolling stock acceleration rates.

Tireless Computing

Much of the difference between manually operated and automatic trains comes down to suboptimal driver behaviour. Human train operators and computers both have to brake early enough to avoid overshooting the platform, but computers can use smaller safety margins, taking into account only variation in train and track characteristics. Human train operators often begin to brake earlier than a computer would, with their decision based on visual cues such as familiar landmarks above ground, or support columns or wayside signals underground.

Fatigue also affects driver performance, and research on this has been carried out in the main line sector. A study into high-speed rail in Sweden's Gröna Tåget research programme found that factors including driver performance can affect travel speed by up to 7%, as drivers do not always apply the brakes at the right time for optimising speed or energy consumption. An article in the Journal of Sleep Research reported that between Melbourne and Adelaide, fatigued train drivers consume 9% more diesel than alert ones. An article in Railway Gazette International earlier this year discussed the effects of fatigue on the safety of commuter railways in North America.

The effect of driver behaviour is magnified on metros, where trains have many more acceleration and deceleration cycles on a given route, and often have to slow down because of congestion. Thus the difference can be substantially more than 7%, as the automation of Paris Line 1 shows.

Another example can be found in New York. One planner at New York City Transit explained to Metro Report that every train on the subway is designed with a maximum deceleration rate of 1·3 m/s^2. In practice trains do not hit this maximum — they decelerate at roughly two-thirds of this rate. The planner explained that NYCT reprimands drivers who exceed the maximum speed and trip the ATP system, but drivers who stay under the speed limit are not punished. The incentive is for drivers to err on the side of slower rather than faster speeds. Thus they begin braking earlier; they also slow down for red signals even if these will change to green were they to keep going.

Partial improvements to speed can be made without full automation. Some of the largest metro networks in the world have installed communications-based train control on some lines in order to add more capacity — adding a degree of automation without making the lines fully driverless.

So far the only metro line in New York with CBTC is the L-Canarsie Line, which saw no immediate speed increase as a result of the signalling upgrade. However, its timetables have held up better than those on other lines, where they have been made more fragile in recent years by speed restrictions and a workplace culture that puts less emphasis on speed.

Living on the Edge

Another reason why ATO helps trains to perform better is that stations on automated metro lines often have platform edge doors. These necessitate precise stopping so that the train doors align with the PEDs. Such precision can only be achieved with modern signalling, typically **CBTC**. PEDs were fitted to stations on Paris metro Line 13 at the same time as **CBTC** was installed. RATP also installed PEDs on Line 1 when it was automated, and the operator is doing the same as it automates Line 4. At 26 km/h, Line 13 is slightly faster than the network average (it has an mean station spacing of 720 m), although it is still slower than Line 1.

A further reason why PEDs improve train speed is that they allow trains to enter stations at full speed. Without barriers between the platform and the track, passengers may lean over the platform edge to peer down the tunnel, forcing the train to slow down more sharply as it enters the station.

Driverless trains serving stations with PEDs save about 20 sec per station stop. Judging by the relative speeds of Vancouver SkyTrain and Paris Line 13, the bulk of the speed gain comes from automation rather than from PEDs. This saving compares favourably with average delays on the largest metro networks. The average delay is about 4 min in London and 3 min in New York. With variations in average journey lengths in those cities, the time saving achieved through using driverless trains is equivalent to eliminating about half of the delays in London or all delays in New York.

Ultimately, computers are more precise and accurate than humans at narrow technical tasks, such as driving a train. The greater precision of ATO and CBTC have led some operators to adopt these technologies to increase capacity by running trains at shorter headways, but automation also permits substantial increases in speed.

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- 23 May 2018 - Fast Forward plan seeks to renew the New York Subway
- 23 Apr 2018 - Paris Line 6 to get ATO
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- 02 Jun 2017 - Tramlink automated tram speed monitoring systems sought

- 31 Jan 2017 - Contract awarded to make Lyon metro Line B driverless
- 04 Mar 2016 - Stadler to supply driverless metro trains to Glasgow
- 07 Jan 2016 - Siemens to automate Paris metro Line 4
- 28 Jul 2015 - New York CBTC contracts approved
- 03 Nov 2011 - Automated trains launched on Paris Line 1
- 04 May 2010 - CBTC trials on New York's Flushing Line
- 12 Mar 2009 - Canarsie CBTC goes live

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Paris regional smart Ticketing Contract awarded; France

21 Dec. 2018

FRANCE: Paris regional transport authority Île-de-France Mobilités has selected a consortium of payment technology company Worldline and digital platform supplier Conduent to implement its Smart Navigo ticketing programme.

The authority aims to begin rolling out new ticketing products from 2019, gradually replacing paper tickets with contactless technology. It will become possible to use smartphones to buy and validate T+ single-use tickets and Navigo passes, and for Navigo Liberté+ account-based ticketing. Passengers will be able to use smartphones instead of vending machines to top-up Navigo smartcards or directly as a payment method. Navigo is also expected to support new services such as car park access.

Deployment is also intended to support competition in the Paris regional transport market, with some bus services expected to be tendered in 2021 and potentially including some metro and RER services by 2040.

The contract announced on December 18 is worth a minimum of €60m, covering development of the central back end and connecting it to the ticket distribution and validation systems. Worldline is to deploy its WL Tap 2 Use software-as-a-service account management system, supporting pay-per-use, e-commerce and online subscriptions. Conduent will provide its Atlas ticketing software, designed to handle changes in products offered and volumes processed.

'Île-de-France Mobilités wishes to make life easier for millions of Parisians and tourists who use public transport in Île-de-France, thanks to ticketing services among the most modern in the world', said Laurent Probst, Managing Director of Île-de-France Mobilités. 'We have therefore chosen a technical solution that is both innovative and proven elsewhere in France and around the world in other sectors such as banking, and entrusted the implementation to key players in the industry.'

Related news

- 27 Dec 2018 - Paris commuter EMUs ordered

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Integrating driverless Road Shuttles into public Transport; International, USA, Switzerland

05 Dec. 2018

INTERNATIONAL: **Bestmile** and Init announced on November 28 that they will work together to develop technologies to enable the incorporation of driverless road vehicles into public transport operations.

Focusing on autonomous vehicles for first and last-mile services connecting to transport hubs, the companies aim to integrate their respective back-end software. This would enable dispatchers in a control centre to track all transport services within one monitoring system. Init and **Bestmile** also intend to develop real-time passenger information, planning and ticketing systems to cover public transport and driverless shuttles.

‘**Bestmile** is the ideal partner to help us deliver the next generation of smart mobility solutions’, said Init’s Head of Research Dirk Weißer. ‘Its proven technology will enable us to fully incorporate autonomous first and last-mile services into the central management tool of public transit providers — the fleet management system.’

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METRO NEWSLETTERS
on
URBAN MOBILITY

PUBLIC MULTIMODAL URBAN, SUBURBAN AND INTERURBAN PASSENGER TRANSIT SYSTEMS WITH METRO-BUS, LIGHT-RAIL, METRO-RAIL, REGIONAL RAPID TRANSIT, COMMUTER-RAIL, ROPE-WAY, WATER-METRO, AUTOMATED PEOPLE-MOVER

TRANSPORTATION AND ECONOMIC DEVELOPMENTS IN MODERN URBAN/MEGAPOLIS ENVIROMENT

METRO Newsletter by Dr. F.A. Wingler
METRO 22, December 2019

Chennai Metro,

PART I: ACTIVITIES FOR URBAN MOBILITY SOLUTIONS IN INDIA

ICA to offer Loan Assistance of Rs.20,196 Crore for Chennai Metro Rail; India

23 Dec. 2018 in Category(ies): Posted on Categories Chennai Metro, Investments, PPP, FDI, SPVs and Innovative Funding Models in Rail Industry, Japanese International Cooperation Agency (JICA)

JICA has approved funding for the second phase, which would cost an estimated Rs 40,941 crore.

CHENNAI: The Japan International Cooperation Agency (JICA) will offer a loan assistance of Rs 20,196 crore for the 52.01 kms phase-II of Chennai Metro Rail project, the Tamil Nadu government said Saturday.

JICA has approved funding for the second phase, which would cost an estimated Rs 40,941 crore, a state government release said.

It is aimed at extending Metro rail connectivity between Madhavaram and Sholinganallur (35.67 kms) and from Madhavaram to Chennai Mofussil Bus Terminal (16.34 kms), the release added.

Union Finance Ministry, Additional Secretary, C S Mohapatra and Japan Ambassador to India, Kenji Hiramatsu formally exchanged documents at an event in New Delhi, Friday.

The loan agreement for providing the first tranche under the Official Development Assistance (ODA) of 75,519 million Japanese Yen (about Rs 4,770 crore) was also signed between Mohapatra and JICA, chief representative, Katsuo Matsumoto.

The funding would further enhance Metro Rail connectivity to various parts of the city.

Additional Chief Secretary, T.V. Somanathan and Chennai Metro Rail Managing Director, Pankaj Kumar Banswal were also present on the occasion.

Chennai Metro Rail Limited (CMRL) is the Executing Agency of the Project.

Chennai is the fourth-largest metropolitan area in India. The population of the Chennai Metropolitan Area was about 7.1 million in 2001 and grew to 8.7 million in 2011. Population density in Chennai City is about 25,000 people per square kilometre, which is one of the most in the world, overtaking Mumbai and Kolkata. The newly inaugurated stretches will mitigate the difficulties caused by increasing road traffic in Chennai. These expansions in the city’s metro rail network will eventually lead to balanced regional development and enhancement of environmental conditions.

The Chennai Metro Project is an extraordinary example of Indo-Japanese partnership and has gained success that other Metro projects are looking forward to emulating.

JICA has extended 183,595 million Japanese Yen (approximately INR 11,300 crore) in concessional Official Development Assistance (ODA) loans since 2008 to develop the Chennai Metro Project. Overall, JICA has extended ODA loans of 1.1 trillion Japanese Yen (approximately INR 60,000 crore) to help develop metro systems in Delhi, Bengaluru, Kolkata, Chennai, Mumbai and Ahmedabad.

Delhi State Govt. rejects NCRTC Proposal to build elevated Station at Sarai Kale Khan; India

20 Dec. 2018 in Category(ies): Posted on Categories National Capital Region Transport Corporation Limited (NCRTC)

NEW DELHI: Regional Rail Transit System (RRTS), the high speed connecting Delhi with its peripheral area appears to have missed the July 2024 deadline as Aam Aadmi Party (AAP) Government has officially rejected the National Capital Region Transport Corporation's (NCRTC) proposal to build an elevated station for RRTS at Sarai Kale Khan.

To make Sarai Kale Khan a new phase of ISBT in national Capital, the AAP Government has suggested NCRTC to build its station underground.

The Delhi Government has been planning to revamp Sarai Kale Khan and provide connectivity between the Metro, railway station and the bus stand using travelators and skywalks.

According to officials in the Delhi government as well as the Ministry of Housing and Urban Affairs (MoHUA), which is behind the RRTS project, the bone of contention is whether the station would be built overhead or underground. While RRTS wants an overhead station, Delhi Government is insisting on an underground one before it gives its nod to the project, to be co-funded by the governments. Till a decision is made, the revamp of Sarai Kale Khan will remain stalled.

DELHI GOVERNMENT'S PLAN

Delhi Governments new building for Sarai Kale Khan ISBT has been stuck for more than five years as the site was earmarked as a green area in the Master Plan prompting Delhi Development Authority (DDA) to withhold its nod.

"The MoHUA changed the land use from 'District Park' to 'Transportation' in February 2015. This was done to facilitate the Delhi Government in developing Sarai Kale Khan ISBT," said a senior Government official.

According to a Delhi Government official, ISBT will be developed as a multi-modal transit centre that will integrate city bus service and railways. Thirty per cent of the land has been kept for building hotels at the ISBT, which will have airport-matching facilities.

"This ISBT will be developed with facilities for underground bus parking, car parking and designated places for autos, taxis and two-wheelers," the official said.

A complete makeover has been proposed for the ISBT at Sarai Kale Khan, which was established in 1996 and caters to nearly 800 buses and more than 50,000 passengers every day.

NCRTC's PROPOSAL

Whereas in its proposal, the NCRTC have not neglected these redevelopment plans of Delhi Government either for renovating ISBT or constructing a hotel at Sarai Kale Khan.

According to NCRTC which is implementing agency of RRTS, there is no restriction in Delhi Governments redevelopment plans. "The construction of RRTS station and redevelopment of ISBT as proposed by Government is possible. The only modifications regarding sites of hotel or ISBT have been proposed that too with intent to provide maximum benefit to commuters," said a senior NCRTC official.

"The entire focus is on seamless movement of commuters from one mode to another.

Moreover, since an underground Metro Station is already existed over there, so an underground RRTS station has to be 50m below ground, so considering the current state of affairs at Sarai Kale Khan, no parallel activity is possible, when digging for the construction of an underground RRTS station would take place, which is a time-consuming affair and will take years to complete.

So redevelopment would only be possible with an elevated RRTS station as proposed by NCRTC," said the official.

Regional Rail Corridor of Delhi-Gurugram-SNB approved by NCRTC Board; India

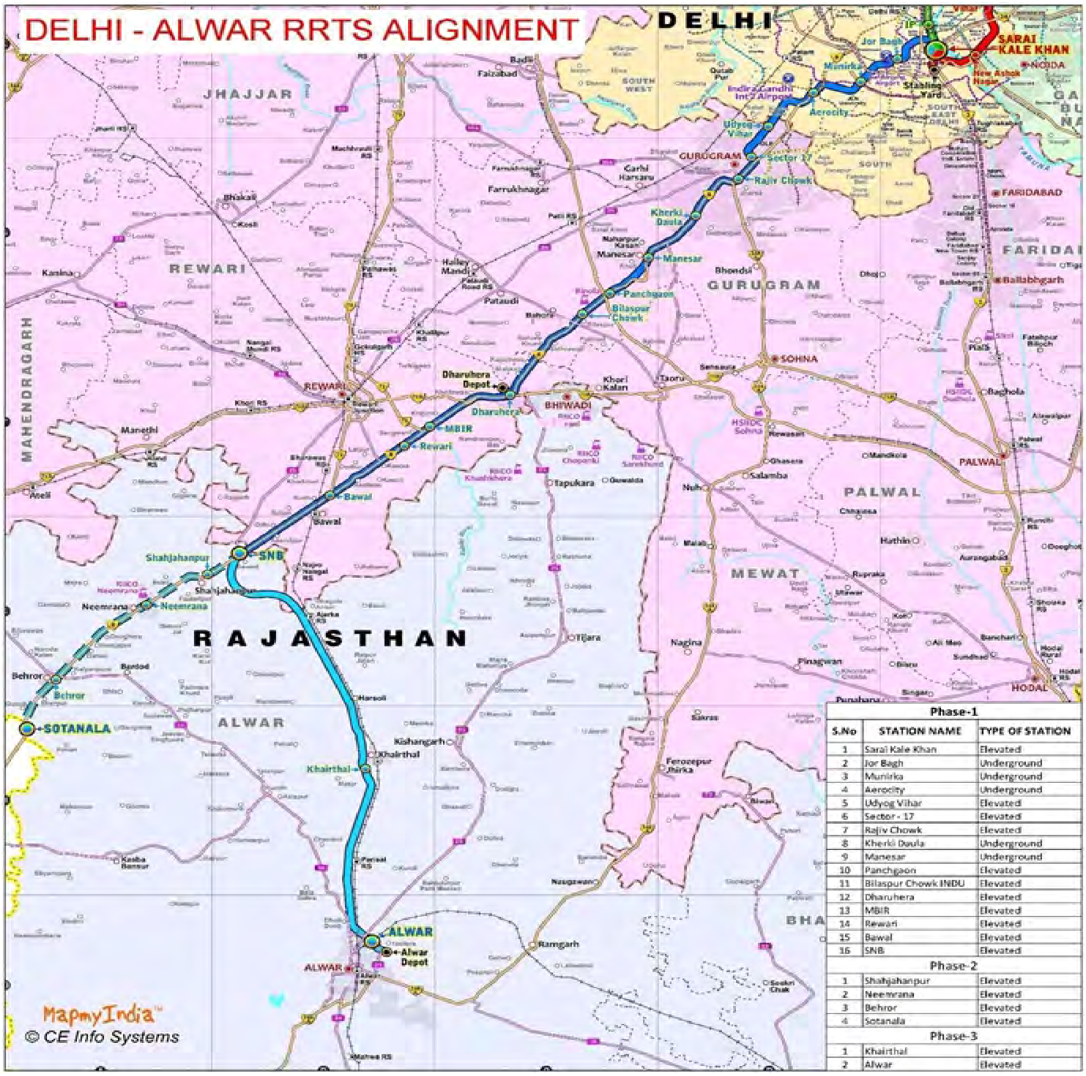
19 Dec. 2018 in Category(ies): Posted on Categories National Capital Region Transport Corporation Limited (NCRTC)

Another Corridor of Regional Rail makes headway – NCRTC Board approves DPR of Delhi–Gurugram–SNB RRTS Corridor

NEW DELHI: NCRTC Board, chaired by Secretary, Ministry of Housing & Urban Affairs, in its meeting held on 6th December 2018, has approved the DPR (Detailed Project Report) of Delhi-Gurugram-SNB (Shahjahanpur-NeemranaBehror Urban Complex) RRTS corridor.

One of the three RRTS corridors prioritized for implementation, Delhi-Gurugram-Alwar is planned to be implemented in three stages. In stage I, Delhi – Gurugram – Rewari – SNB Urban Complex will be constructed. In Stage II, it will be extended from SNB Urban Complex to Sotanala and in Stage III, SNB Urban Complex to Alwar will be constructed.

The 106 km long, Delhi-Gurugram-SNB corridor will be elevated for about 71 km (11 stations), the remaining 35 km (5 stations) will be constructed underground, mostly in Delhi & Gurugram. This corridor will converge with other RRTS corridors in Sarai Kale Khan and will be interoperable, facilitating commuters' movement from one corridor to another without the hassle of changing trains.



Delhi-Gurugram- SNB Corridor Map, Station list, reference image of RRTS train and NCRTC logo are annexed.

Similarly, with an intent to incentivise the use of Public Transport, Delhi-GurugramSNB corridor will be seamlessly integrated with other modes of transport in NCR:

RRTS station	Mode of transport with which integration provided
Sarai Kale Khan	Line-7 of DMRC at Sarai Kale Khan, Hazrat Nizamuddin Railway station and ISBT Sarai Kale Khan.
Jor Bagh	Line-2 of DMRC at Jor bagh station
Munirka	Line-8 of DMRC at Munirka station
Aerocity	Airport, DMRC- At Aerocity- Airport Express Line & proposed Phase-IV Line
Udyog Vihar	Proposed Extension to Gurugram Rapid Metro & Proposed Metro from Gurugram Railway Station
Kherki Daula	Proposed Bawal metro and Proposed Bus terminus
Panchgaon	Proposed Bawal Metro, Proposed ISBT, Proposed Multimodal hub
Bawal	Bawal Bus Stand

RRTS trains with design speed of 180kmph, operation speed of 160kmph and average speed of 100kmph will be available at a frequency of every 5-10 minutes. The infrastructure is being designed for up to 9 coaches train. These trains will be airconditioned with transverse seating and overhead luggage space for commuter comfort. There would be priority seating arrangements for people with special needs, an exclusive coach for women travelers and a business class coach in every train to encourage people to leave their cars for public transport.

This RRTS smart line will pass through the urbanized and industrialized areas of Haryana and connect Delhi airport with the RRTS network, increasing the overall productivity of NCR. The corridor will strengthen the regional transport infrastructure by providing a fast, safe, comfortable and reliable mobility option to the residents of Delhi, Gurugram, Rewari, Manesar, Daruheda, Bawal and nearby areas. The fast commuting connecting Delhi to nearby regions will be immensely beneficial in decongesting Delhi and its roads, providing citizens the choice to live & work in different regional nodes to lead a better quality of life.

Once constructed, the corridor is expected to bring down the travel time between SKKSNB in less than 70 minutes (106 km). The daily ridership on this corridor is estimated to be 8.5 Lakhs in 2025. This high-speed, high-frequency, high-capacity RRTS corridor will not only offer mass transit benefits but also bring in wide range of economic benefits to the society including effectively curbing pollution, improving safety & reliability of commute and creating employment as well as new economic opportunities. Apart from unlocking economic development potential of the region, such high-speed commute will bring people and places closer enabling polycentric growth in NCR.

The corridor is planned to be constructed in about 5 years' time excluding 1 year of preconstruction activities at a base construction cost of INR 24,975 crore, funded by Government of India (20%), concerned State Governments (20%) and bilateral/multilateral funding agencies (60%).

NCRTC is a joint venture of the Government of India (50%) and State Governments of Haryana (12.5%), NCT Delhi (12.5%), Uttar Pradesh (12.5%) and Rajasthan (12.5%). It is mandated to design, construct, finance, operate and maintain RRTS in NCR and works under the administrative control of Ministry of Housing & Urban Affairs, GOI.

Out of the 8 identified corridors to connect various NCR towns with high-speed rail commute under the Functional Plan on Transport for NCR-2032, three have been prioritized for implementation in Phase-1 by the Planning Commission appointed Task Force, these are Delhi-Ghaziabad-Meerut, Delhi-Gurugram-Alwar and Delhi-SonipatPanipat. This is the 2nd RRTS corridor, which has been approved by NCRTC Board after Delhi-Ghaziabad-Meerut.

Mismanagement is costing Bangalore Metro Crores: Says Rail Employees Union; India

10 Dec. 2018 in Category(ies): Posted on Categories Bangalore Metro, Trade Unions & Associations

BANGALORE: The Bangalore Metro Rail Employees Union, which had infamously disrupted services once for seven hours last year, has alleged that Namma Metro is losing around ₹40 crore a year due to mismanagement, financial irregularities and favouritism towards some contract employees.

“Namma Metro need not wait for ridership to touch five lakh a day to break even. It can report a profit if the management takes initiative to fix a few anomalies,” Surya Narayana Murthy, Vice-President of the Union and former employee of Namma Metro, said.

He suspected a scam in the monthly bill payments to about 12 private cab agencies that provide pick-up and drop facility to officials for site inspection. “For years, the BMRCL has been spending ₹50 lakh a month towards payment to the cab agencies. How could the monthly bill be so huge when there are only 50-odd site officials?” he asked.

As proof, Murthy showed documents — accessed under the Right to Information (RTI) Act — on monthly payments made to the cab agencies. “The expenditure is equal to buying five new cars every month or 60 new cars every year,” he said.

He also questioned the recruitment of 769 contract employees and the company’s promotion policy. “Already, there are about 1,230 regular employees who work in the operation & maintenance department as train operators, station managers and so on. What purpose does it serve to hire contract employees when all the other work, including construction and housekeeping, is outsourced?” he asked.

Murthy alleged the BMRCL hired at least 500 contract employees even though there was no requirement and suspected irregularities in the recruitment process. The company, he said, does not have a proper promotion policy for contract employees. “Some employees are being promoted with exorbitant hike based on the recommendation of a few influential officers.”

He alleged financial irregularities and undue favours while allotting retail spaces, advertisements and parking management at stations. “If the management is not able to manage the company property, why are they being paid?” Murthy, a practising advocate, said. “If the Central Vigilance Commission (CVC) takes up a probe, the BMRCL will find it difficult to defend itself,” he said.

BMRCL managing director Ajay Seth said he will discuss the matter with the union. “The union has raised a few issues. We will discuss the issue in detail,” he said.

Chennai Metro initiates Feasibility Study for 25.2 km Airport-Kilambakkam Line; India

10 Dec. 2018 in Category(ies): Posted on Categories Chennai Metro, Metro Rail Systems

CHENNAI: In a few years, commuters arriving at the Kilambakkam bus terminus could board a metro train to reach the city without much hassle, as Chennai Metro Rail Limited has started preliminary work to extend its network by initiating a feasibility study. CMRL has floated tenders to find an agency to study the feasibility of extending the airport metro station in phase-1 up to Kilambakkam near Vandalur on GST road.

“When the line comes up, it will also fulfil demands of suburban residents to extend metro rail service till Tambaram,” said a metro rail official.

A metro rail official said the feasibility study would analyse several parameters that will be key to seeking approval for the project. It includes identifying the route from airport to Kilambakkam to build the line, alignment, number of metro stations and their location, land required, method of construction and number of commuters likely to use the service.

'Will seek funds after studying feasibility,' An official said, "Once the feasibility report is submitted, a detailed project report will be prepared for government approval and funding". Metro rail now links all transport hubs in the city through a direct train between Central, Egmore, Koyambedu CMBT and the airport. But ever since the airport line was opened, residents in the southern suburbs have been demanding extension of the airport line till Tambaram.

If metro rail is extended up to Kilambakkam, commuters arriving at the bus terminus could board a metro train to any of the transit hubs.

In May this year, chief minister Palaniswami announced that metro rail services will be extended up to Kilambakkam. "A study will be conducted to extend the metro line up to the proposed mofussil bus terminus and integrate it with all rapid transport systems," the CM said during the inauguration of metro services between Central Metro and Nehru Park and from AG-DMS to Little Mount.

Railways to produce Metro Rail Coaches at MCF/Rae Bareilly Factory; India

20 Oct. 2018 in Category(ies): Posted on Categories Indian Railways (IR), Metro Rail Systems, Modern Coach Factory, Raebareli (including Coach Factory for Forged Wheels and High Speed Train Rail Wheel and Axle Research & Development Centre)

In a 1st, railways to use robots to manufacture Metro Rail Coaches under Make In India at its Rae Bareilly based factory. It will also be the first factory in the country where coaches will be produced by robots.

NEW DELHI / RAE BARELI: For the first time, Indian Railways will manufacture metro rail coaches at its Rae Bareilly based factory under the Make In India scheme, an official said Thursday. The coaches will be manufactured by robots and will be on par with those being manufactured by Canadian firm Bombardier, currently being used by metro trains in the country.

Multi-Robot Multi-Gauge Coach Shell fabrication commissioned as 1st in India for high quality flexible fabrication of Broad/Standard/Metre/Cape gauge coaches!

They will be 40 per cent cheaper than those procured from China and other countries and will be equipped with Wi-Fi, CCTV cameras, mobile charging outlets among other facilities, the official said. In addition, they will also boast of safety features including signalling, door control and train management systems along with modern surveillance gadgets on board.

“We already have had two meetings with the government on producing metro coaches. The Maharashtra government has given it’s approval for coaches for two metro trains,” said Rajesh Agarwal, member (rolling stock), Railway Board. “We are making a total of six metro coaches as of now,” Agarwal said further adding, that the cost of each coach would be Rs 8 crore, while those procured from China or other countries cost around Rs 12 crores. The board has decided to go for standardised coaches and has asked the Research Designs & Standards Organisation (RDSO) and the Modern Coach Factory (MCF) to invest in making it a reality, the official said.

Agarwal said the expansion of the MCF at a cost of Rs 480 crore– including recruitment of experts and technicians on a large scale– will be completed by December 2018. “It will also be the first factory in the country where coaches will be produced by robots,” he said.

The $65m expansion of MCF is in the states of completion by December this year.

Automated Material Handling at MCF, Rae Bareli

MCF’s automated railway wheel set maintenance facility will utilize a variety of modern automation systems at the Rae Bareli plant. This technology primarily moves wheel set components such as bearings, wheels, or axles and assemblies such as wheel sets, pairs of wheels, and bearing pallets between machine tools and throughout the wheel shop. Their use decreases direct human contact with wheel set components and machines, increasing personnel safety and reducing opportunities for error. It also decreases the need for forklifts and manual overhead cranes to move the work pieces. The shop floor of an automated facility does not rely on in-floor rails or raised rails to convey wheel sets, allowing easier access to key machines and measuring systems. This also permits adding machines to a particular cell or area without having to rework material handling systems. The automation systems at Rae Bareli include:

- Programmable Robots
- Overhead Gantry Cranes
- Escapements
- Turntables

These automation systems communicate with the wheel shop's Production Control System and the machines' integrated measurement capabilities to route the wheel set components to the relevant machine or machine cell for assembly, disassembly, machining, and measurement. They can be reprogrammed to avoid machines that are temporarily down for maintenance, allowing the shop to remain productive and limiting overall downtime.

Modern Coach Factory at Rae Bareli customizes all automation systems to meet the wheel shop's current and future production capabilities, with overhead gantry crane robots for easiest reprogram to accommodate additional machines and operations with technology for successful design, manufacturing, installation, and total integration of all machines and automation systems.

The plant specializes in custom welding robot systems for tasks such as the production of bogies and their components. For the sub-assemblies, floor tracks with rotary arms will be used; during assembly, the robots are placed on 2- or 3- axis slide systems. L-shaped manipulators used to permit high-quality welding in the flat position.

In the complete fabrication of passenger cars for Metro Rail, different processes such as MIG/MAG, plasma, contact points and resistance welding are combined on fabrication lines with corresponding clamping and transport systems. Bogies, roof sections, and window frames are fabricated using standard robot systems or with custom portal solutions using MIG/MAG single-wire and tandem, plasma, and spot welding processes.

Metro train sets require aluminum bodies. Equipped with a push-pull wire feed on the "TorchDrive" wrist joint and the laser camera, these robots can also handle this application.

DMRC to prepare a DPR for a Metro Line between Mira-Bhayander and Virar; India

4 Oct. 2018 in Category(ies): Posted on Categories Metro Rail Systems, Mumbai Metro Rail System, Mumbai MetroOne Pvt Ltd (MMOPL)/Mumbai Monorail Ltd/SPV between MMRDA/Reliance Infra./Veolia Transport, France

MUMBAI: In another boost to connectivity, the Mumbai Metropolitan Region Development Authority (MMRDA) has decided to connect Mumbai and Virar with a Metro line. Currently, Vasai and Virar are connected only by a suburban railway line, which is overburdened, leading to a long-standing demand from locals for creation of a mass transport mode to supplement it.

The Delhi Metro Rail Corporation (DMRC) will prepare a detailed project report (DPR) for a Metro line between Mira-Bhayander and Virar. The state government in September gave a nod to the construction of a 10.5-km Dahisar-Mira-Bhayander (Metro 9) corridor. “We want to improve the connectivity in the MMR, so we decided to extend the network to Virar,” said a senior MMRDA official, requesting anonymity, adding the line between Mira-Bhayander and Dahisar will be extended northward to Virar.

Another MMRDA official added the Metro line could go via the national highway connecting Mumbai and Virar. “Although it is still very early to comment, one of the ideas is to take it through the highway. It will boost development in that part of the area. Residential and commercial spaces can come up there. However, DMRC will study whether the parallel line with the western railway or via the highway is a better option,” he said.

Ashok Datar, transport expert, questioned the “overzealous” attitude of the government while planning Metros. “It should be carefully studied whether the Metro line will have 30,000 passengers during peak hours, which is the main criterion in the Government of India’s Metro policy. Also, railway commuters are used to paying 20paise for a kilometer. Will they pay ₹3 or ₹4 for a km? Will they achieve the ridership they aim to get,” Datar asked.

Another transport expert AV Shenoy welcomed the idea. “Apart from building Metro lines, MMRDA should also focus on creating jobs and employment by planning growth centres in Virar, so people don’t have to travel to Mumbai,” he said.

Chennai Metro: CMRL Authorities to inspect 21-km elevated Corridor; Test for structural Strength; India

10 Sep.. 2018 in Category(ies): Posted on Categories Chennai Metro, Metro Rail Systems

CHENNAI: To check the stability of elevated metro rail corridors that run across two arterial roads, Chennai Metro Rail Ltd will soon begin inspection of the structures. CMRL is looking for a firm that has the expertise to inspect, investigate and submit a report with suggestions. Metro rail operates a 21km elevated corridor from Thirumangalam ramp to St Thomas Mount and Saidapet ramp to Airport.

“Such inspections are important once an elevated section completes two years of operation. The contractor will only inspect the corridor and submit a report to us in six months. Depending on the outcome of the report, we will decide on the next step,” an official said. A team of experts will inspect the structures on parameters including strength, stability, development of cracks among others. More than 500 columns and the viaducts above them will be checked during the inspection.

“The most important part of the structure is the rubber bush between the columns and the deck on which tracks have been laid. We must periodically check its condition and position and look for disturbances that may have occurred due to the movement of trains above,” a CMRL official said.

The inspection is critical for the safety of metro rail passengers as well as those on the road below. In August in Kochi, a piece of concrete from a pillar of the elevated corridor fell on an autorickshaw, whose passengers managed to escape unhurt.

This is will be the second inspection on the elevated corridor. “Last time, we got quotations from contractors instead of floating tenders as the stretch was small and the value was less. This time the value is high as the entire corridor is to be inspected,” an official said.

Massive Railway & Metro Rail Infra Boost in UP; more Cities to get Metro Rail; India

6 Sep. 2018 in Category(ies): Posted on Categories Agra Metro, ECR-Mughalsarai Division, Indian Railways (IR), Kanpur Metro, Lucknow Metro, Metro Rail Systems, NCR-Agra Division, NCR-Allahabad Division, NCR-Jhansi Division, NER-Lucknow Division, NER-Varanasi Division, Noida Metro, NR-Lucknow Division, Union Minister of Railways, Varanasi Metro

LUCKNOW: Uttar Pradesh Chief Minister Yogi Adityanath during the ‘Lucknow Metro Diwas’ said that after Lucknow, Ghaziabad and Noida, more cities will get metro connectivity. The Uttar Pradesh government decided to start metro services in Agra, Kanpur and Meerut cities by 2024 at a total estimated cost of Rs.50,000 crore. There would be two metro corridors in Agra, the Taj city, and the project will cost more than Rs.13,000 crore.

“The Kanpur project will have 31 stations and it will be 30-km-long costing over Rs.17,000 crore, while Meerut Metro project will be of 33 km costing over Rs.13,800 crore,” he said.

Railway Minister Piyush Goyal said on Tuesday that the rail infrastructure in Uttar Pradesh had been severely lagging for decades and that the Modi government is working for a massive infrastructure boost and has increased the capital expenditure manifold.

“During 2009-2014, Rs 5,500 crore were invested on new rail infrastructure in UP while Modi regime allocated Rs 27,000 crore for building facilities in the state by 2019,” said Goyal.

“During one estimate, it was determined that in 65 years since independence, rail infrastructure in UP increased only by 25% while the passenger load increased 15 times and freight demand grew by 12 times,” said railway minister while addressing mediapersons during his Gomtinagar railway station inspection on Tuesday.

Goyal said that there has been a massive increase in development of infrastructure, amenities, services and commercial growth in railways since the Modi government came to power.

While inspecting the ongoing construction work at Gomtinagar railway station, Goyal said that the project is likely to be completed by 2020.

The project of remodelling the Gomtinagar railway station which includes construction of six tracks, 10 platforms, concourse halls, twostorey terminal building, foot overbridges, shopping mall, multilevel parking, connecting dedicated road for arriving and departing passengers, etc, would cost Rs 1,800 crore.

Goa to pitch for Metro Rail Line from North to South Goa; India

29 Aug. 2018 in Category(ies): Posted on Categories Goa Metro, Metro Rail Systems

PANAJI: The state government may pitch for metro rail in Goa to connect north and south Goa under the state's mobility plan. The exercise is being undertaken as part of NITI Aayog's proposal for the transportation sector, carried out with state governments to attain electric mobility and wider renewable energy use.

A senior official said that while the two rivers — Mandovi and Zuari — are hurdles, a seamless metro line can still be a possibility. He also said that the government could take a relook at the failed skybus project. Konkan railway corporation (KRC) scrapped its over-Rs 100 crore project after it figured out that it would not be financially viable.

"The idea will be put before chief minister Manohar Parrikar," the officer said, adding that the draft is being finalised by the department of transport.

The official said that the government is looking at a multi-model connectivity under the mobility plan. Unless there is a complete North-South connect — from Mopa to Karwar — without a break, the metro plan won't work, he said. "It would be ridiculous to expect people to board a metro that stops at Cortalim or Panaji, and compel them to change their mode of transport for their onward journey."

The officer, however, admitted that Goa is yet to make any headway in using energy-efficient modes of transport when some other states have been experimenting with battery-operated or electric vehicles and have made much progress. "Goa still has a long way to go," he said.

All states have been asked to submit a detailed mobility plan, which will be presented at the global mobility summit in New Delhi on September 7-8, which will be inaugurated by PM Narendra Modi. Goa is expected to submit its final draft next week.

Hyderabad Metro Rail works in Old City will begin in next few Days; India

29 Aug. 2018 in Category(ies): Posted on Categories Hyderabad Metro, L&T Group in Rail and Metro Rail business, Metro Rail Systems

HYDERABAD: The much-awaited Metro rail project in Old City will finally take off in next few days. Though the Metro project kicked off in all three corridors five years ago and some stretches have already been opened, it hit a wall in Old City for six years, primarily due to alignment issues between MGBS and Falaknuma.

The Old City Metro rail stretch is part of Corridor II (JBS to Falaknuma). As of now, work is continuing till MGBS and is expected to be completed by March 2019.

Hyderabad Metro Rail Limited (HMRL) authorities said on Saturday they would start Metro rail works in Old City, beginning with a detailed survey and peg marking of the tentative Metro pillar position and station locations on the ground.

Marking on affected structures would also be done as per Road Development Plan (RDP) prepared by Greater Hyderabad Municipal Corporation (GHMC) for widening the road to 100 feet, said Metro officials.

According to initial estimation, as many as 1,000 properties will be displaced in some form on the 5.5-km Metro rail stretch.

"It will take a minimum of six months to complete ground works such as fine-tuning RDP, actual survey of properties, soil testing and finally land acquisition. The actual Metro work will begin later," HMRL managing director NVS Reddy told TOI on Saturday. Reddy along with MIM floor leader Akbaruddin Owaisi and other Old City MLAs inspected the proposed Metro rail route from MGBS (Dar-ul-Shifa Junction) to Falaknuma on Saturday to understand the alignment, road width and properties that need to be taken over for the project, including religious and sensitive structures.

MMRDA gets Bids for Supply of Rail Coaches – total seven Firms Bid for Mumbai Metro Trains; India

23 Aug. 2018 in Category(ies): Posted on Categories Bharat Earth Movers Limited (BEML), Bombardier, CRRC Corp. (CSR and CNR Corp. after merger), Hyundai Rotem, Metro Rail Systems, Mumbai MetroOne Pvt Ltd (MMOPL)/Mumbai Monorail Ltd/SPV between MMRDA/Reliance Infra./Veolia Transport, France, Tenders, Bids, RFPs, EOIs, NITs, eProcurements, eAuctions, Reverse Auctions, Contracts & Order Wins, in Rail Industry, Trackside Intelligence Pty Ltd (Track IQ)

The bidding process is being carried out in adherence to norms fixed by the Asian Development Bank.

MUMBAI: The Mumbai Metropolitan Region Development Authority (MMRDA) has received seven bids from companies interested in supplying rail coaches for the Metro 2A, 2B and 7 corridors. The contractor will provide 378 coaches for the three corridors.

"We have received an excellent response to the tender for rolling stock and are extremely happy to ensure timely completion of both the projects. Our aim is to provide a safe, robust, reliable and energy friendly metro network to the city", said R A Rajeev, Metropolitan Commissioner.

The seven firms that have submitted bidding documents are Hyundai Rotem (Korea); Bombardier India & Bombardier Germany; CRRC Corporation Ltd; Bharat Earth Movers Ltd; Titagarh Wagons & Titagarh Firema; Alstom Transport India & Alstom SA and CAF India & CAF Spain.

The bidding process is being carried out in adherence to norms fixed by the Asian Development Bank (ADB), which is funding the projects. However, this had also led to some delays as the multilateral bank was not in agreement with some of the state's conditions. The ADB objected to the state's proposal to have the arbitration centre in Mumbai and had also sought that the condition to procure 75 per cent of rakes from India be dropped.

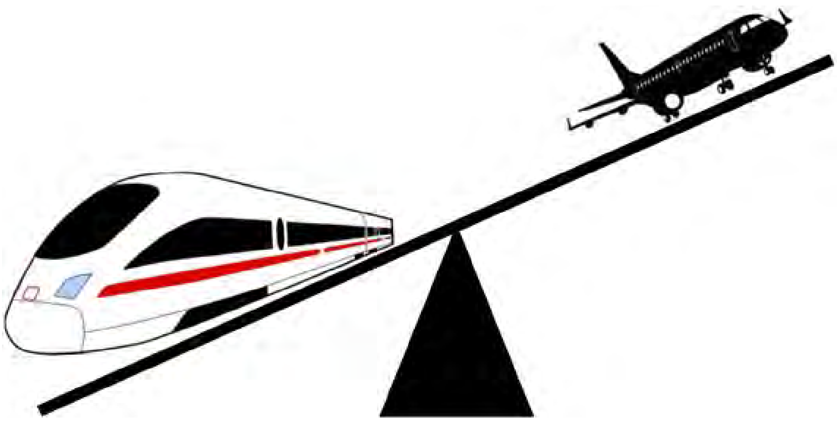
The successful bidder will be appointed after the bid documents are evaluated. The company will provide 63 sets of trains with six cars, each equipped with faster acceleration/ deceleration. The coaches will also have features that make them user-friendly for the differently abled and senior citizens.

Further, the coaches will be air-conditioned and energy friendly with regenerative braking systems, equipped with CCTV security surveillance for passenger security and real-time track monitoring facility to ensure safety. The trains will work on latest CBTC signaling technology system, while the metro station platforms will have platform screen doors for safety of passengers.

Rajeev said that with an excellent response to its rolling stock tender, the MMRDA hopes to ensure timely completion of both the Metro corridors.

BARL submits its DPR on building a 3-phased Ultra High-Speed Maglev Rail System to link Bangalore Airport; India

8 Aug.. 2018 in Category(ies): Posted on Categories Bangalore Airport Rail Link (BARL) Ltd, SWR-Bangalore Division



BANGALORE: Putting its weight behind metro and suburban rail to connect the Kempegowda International Airport (KIA) with the city, the state government has shelved the proposal to build an ultra high-speed train between Cubbon Road and KIA.

The Bangalore Airport Rail Link (BARL) Limited, which was incorporated in 2008 for the high-speed rail project, had submitted a detailed project report (DPR) on building an Ultra High-Speed Maglev Rail system in three phases. Prepared by a Swiss company, the DPR suggested taking up the project in three phases with a distance of 38 km in two phases and a 7 km line in phase 3.

"We are handing over the project to the BMRCL and will transfer the responsibility of BARL as well. The high-speed rail project will be shelved. Instead, we are focusing on connecting the airport under the suburban rail project," said Mahendra Jain, Additional Chief Secretary, Urban Development Department.

The Bangalore Metro Rail Corporation Limited (BMRCL) has already called tender for detailed design consultation for Nagavara-KIA metro line being taken up under Phase 2B. The state government approved the Rs 5,950-crore project last year.

Jain said the single railway line to Devanahalli, which passes next to the airport, has to be doubled. "We have held discussions with railway officials on doubling and electrification of the line. We can have upgraded railway lines to support a superfast train," he said.

A source said the government will emphasise on suburban rail as it promises faster commute at more affordable fares. "Rail fares are cheaper than metro fares. So those regular travellers on the route can travel with a monthly pass. We will push for rail connectivity," the source said.

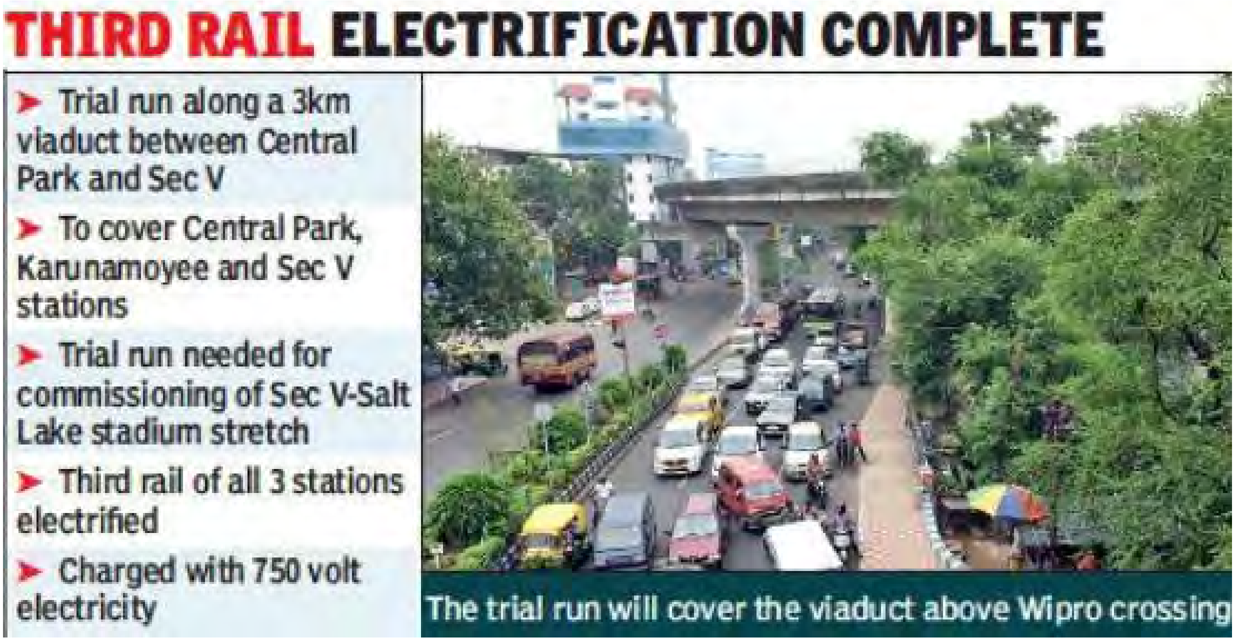
The state government is also set to wind up BARL, which was assigned the task of implementing monorail or light rail transit (LRT) besides the high-speed rail project. "The BARL had to implement LRT on Hebbal-JP Nagar along the western portion of outer ring road, and Magadi Road toll gate to Kachohalli gate beyond Nice Road. Since all these projects are being taken up by the BMRCL, we are recommending dissolution of BARL," sources said.

Kolkata East-West Metro ready for Trial Run between Central Park & Sec-V; India

4 Aug.. 2018 in Category(ies): Posted on Categories Ansaldo STS Transportation Systems, Bharat Earth Movers Limited (BEML), East West Metro Kolkata, Kolkata Metro, Metro Rail Systems, Mitsubishi Electric, Rail Enterprise, Industry, OEMs, EPCs, PFT & SME Sectors (incl. non-Railway PSEs under other Ministries) in Rail Business, Railway Board/Ministry

KOLKATA: Kolkata Metro Rail Corporation (KMRC) is likely to launch a trail run on a 3km stretch between the Central Park depot and Sector V station on Wednesday.

This will be the first time that one of the two six-car rakes housed inside the depot will venture out after an informal test run was carried out on the 1km stretch within the upkeep-cum-parking hub on June 20. PSU Bharat Earth Movers Limited (BEML) has built the rakes and is in charge of the 38.5-acre stabling line as well.



An official, though, said in case of heavy rain, the trial run would be started from Thursday.

The trial run, which will synchronize trains with the system, will be done since electrification of third rail (from where the train will derive power) of three East-West Metro stations — Sector V, Karunamoyee and Central Park (all in Salt Lake) — could be completed last Wednesday.

Ahead of the trial run, senior officials of KMRC, which is implementing India's first underwater Metro corridor project between Howrah Maidan and Sector V along with those from BEML, convened prolonged meetings at the Central Park depot. Over the last one month, especially before the electrification of third rail in the three stations was completed , KMRC officials flew to Bengaluru, where BEML is headquartered, for insights into running the rakes. A team of experts from BEML will assist KMRC in conducting the trail runs.

On Tuesday, KMRC engineers were conducting inspections to check safety parameters including track and alignment. Test-charging of the third rail of the three stations was done around 5pm.

There will be two sources of power in each station. One is the sub-station, from where electricity is transmitted to the third rail, and the other is the auxiliary source, which supplies power to the stations and other areas. Work for the sub-station is almost over.

While the train propulsion system has been procured from Japanese firm Mitsubishi, the signalling system is from French firm Ansaldo Signaling and Transportation Systems. Without propulsion and control equipment, no train can move.

The first phase of the project — between Sector V and Salt Lake stadium — is expected to be operational in October. Last-minute touches are being given to the stations — six on this stretch. Electrical charging of third rail at other three stations will be completed in the next fortnight.

The stretch, which will give residents of Salt Lake access to the mass transit system for the first time, will, for now, link Sector V with Salt Lake stadium, and eventually till Howrah Maidan through the under-river tunnel. This will cover only 6km of the ambitious project that aims to connect the eastern part of Kolkata to Howrah in the west through a 16.5km Metro link across the Hooghly river by 2021.

Construction of the viaduct in Salt Lake had started in 2009, but the 6km stretch has gone through several land hurdles.

CRRC Subway Cars running in Mumbai, New Dehli, Noida & Gurgaon gains Reputation: Vikas Sardana, VP/Mumbai Metro-1; India

2 Aug. 2018 in Category(ies): Posted on Categories CRRC Corp. (CSR and CNR Corp. after merger), Headlines, Metro Rail Systems, Mumbai Metro Rail System, Rail Enterprise, Industry, OEMs, EPCs, PFT & SME Sectors (incl. non-Railway PSEs under other Ministries) in Rail Business

NEW DELHI: Metro Line 1 is the only subway track of Mumbai, the financial centre of India. It drives through Mumbai's information technology center Versova, manufacturing center Ghatkopar, as well as the city's largest transportation hub Andheri.

All the 16 trains running on the line were produced by China's CRRC Nanjing Puzhen Co., Ltd. The 16 trains have maintained over 6 million kilometers of safe operation since the metro line came into service in June 2014.

These subway cars have won the trust and praise of the Indians because of the quality and comfort they offer, opening broad space for rail traffic cooperation between China and India.

The Chinese subway cars are made of light-weight stainless steel with fire-resistant silver doors. Each one of them has eight sliding doors that can open wide to offer easy access for wheelchairs. Even when the number of passengers rises sharply at around 5 p.m. every day, these trains are still able to handle the huge capacity.

The interior of the train is clean, bright and spacious. The floor is slip-resistant and the seats are arranged in a longitudinal fashion. The facilities are user-friendly, such as the

LCD televisions that broadcast dynamic route maps and entertaining programs for passengers.

The air conditioners could automatically adjust the temperature through sensors installed. The windows are made by double-glazed glasses, blocking outside noises. In addition, the train is also equipped with first-aid supplies, firefighting equipment and communication devices.

Metro Line 1 covers a length of 11.4 kilometers and most of the distance is built on the ground with some part running on bridges. It takes only 24 minutes to travel the distance by train, much less than the 1.5 hours by car and 2 hours by bus.

The 16 trains were the first whole-vehicle rail transit equipment China ever exported to India, said Zhai Weijia, head of the after-sale and warranty department of CRRC Nanjing Puzhen's Mumbai metro project. In May 2008, the company signed an agreement with the Indian side and in 2010 the first train was shipped to India.

Carrying more than 400,000 people on a daily basis, The Metro Line 1 sees one of the highest passenger densities of any metro lines in the world, according to Indian media. In the first year of operation, the line handled over 92 million passengers, bringing an income of $200 billion. It crossed the landmark of carrying 250 million people on the 957th day of operation, setting a record in unit time capacity among all Indian subway trains.

Mumbai is India's largest city with a huge population density. Its government placed the city's hope to relieve traffic congestion on building subways.

Back to 2008, 6 enterprises participated in the bidding of the city's subway construction, and CRRC was finally chosen by the organizer – India's Reliance Industries – after beating 5 competitors including Siemens, Bombardier and Alstom.

"Compared with other suppliers, CRRC offered high quality at lower prices, that was why we chose the Chinese manufacturer," said Vikas Sardana, vice president of Mumbai Metro Line 1.

"Reliance Industries is the first Indian company to use Chinese trains. Some questioned our choice, but facts have proved that these Chinese subway cars are reliable," he added.

The Chinese trains have won the trust of the Indians with the excellent quality and technologies. So far, the Chinese trains have been operated for more than 6 million kilometers without a single malfunction. The trains report low failure rate and the vehicles and facilities operate smoothly. In the past 4 years, not a single accident rescue has happened.

Zhai disclosed that the trains were delivered in 2010 and put into service in 2014, and the Indian side was amazed at the fact that they experienced no performance reduction after four years of non-operation.

Besides, these trains produced under Chinese standards passed all the tests at one stroke after they were shipped to India, Zhai said.

Now, Chinese trains are running in New Dehli, Noida and Gurgaon, said Vikas, adding that India is a potential market of subway cars and he hopes to deepen cooperation with Chinese companies in this field.

Hyderabad Metro Project expects Break-Even in the next 6 Years; India

24 Jul. 2018 in Category(ies): Posted on Categories Hyderabad Metro, L&T Group in Rail and Metro Rail Business, Metro Rail Systems

The concessionaire L&T Metro Rail (Hyderabad) Limited is building the project across three corridors.

HYDERABAD: The Hyderabad Metro Rail Limited (HMRL) project expects to break even in six years, a top official said today. "As per our financial model, L&T Metro Rail (Hyderabad) Limited will incur losses for about four-five years and sixth year it will break even that's what our expectation is," HMRL Managing Director NVS Reddy told reporters here after launching e-scooters of Metro Bikes for first and last mile connectivity at metro stations.

The concessionaire L&T Metro Rail (Hyderabad) Limited is building the project across three corridors. In November last year, Prime Minister Narendra Modi had inaugurated a 30-km stretch between Miyapur and Nagole out of the 72-km long elevated metro project. There are 24 stations in the operational 30 km stretch.

"Sixth year we expect the break-even. Because, the debt burden is very very high. Out of about Rs 16,500 crore which they are investing Rs 3,000 crore is their equity and Rs 12,500 crore plus is debt. Interest burden alone per annum will be Rs 1,300 crore. That's the main challenge," Reddy said.

Hyderabad Metro is recording footfall of 80,000-85,000 passengers per day (in the operational 30 km stretch of Miyapur-Nagole), he said adding "Once we open remaining two sections I am expecting that it will be five lakh passengers per day and from there 15 lakh passengers in the next couple of years."

On the Ameerpet to LB Nagar (16 km) stretch, Reddy said any time in August it will be opened for passengers. Reacting to another query on commercial space demand (spaces within Metro Rail stations and malls adjoining the stations), Reddy "the commercial space demand is excellent".

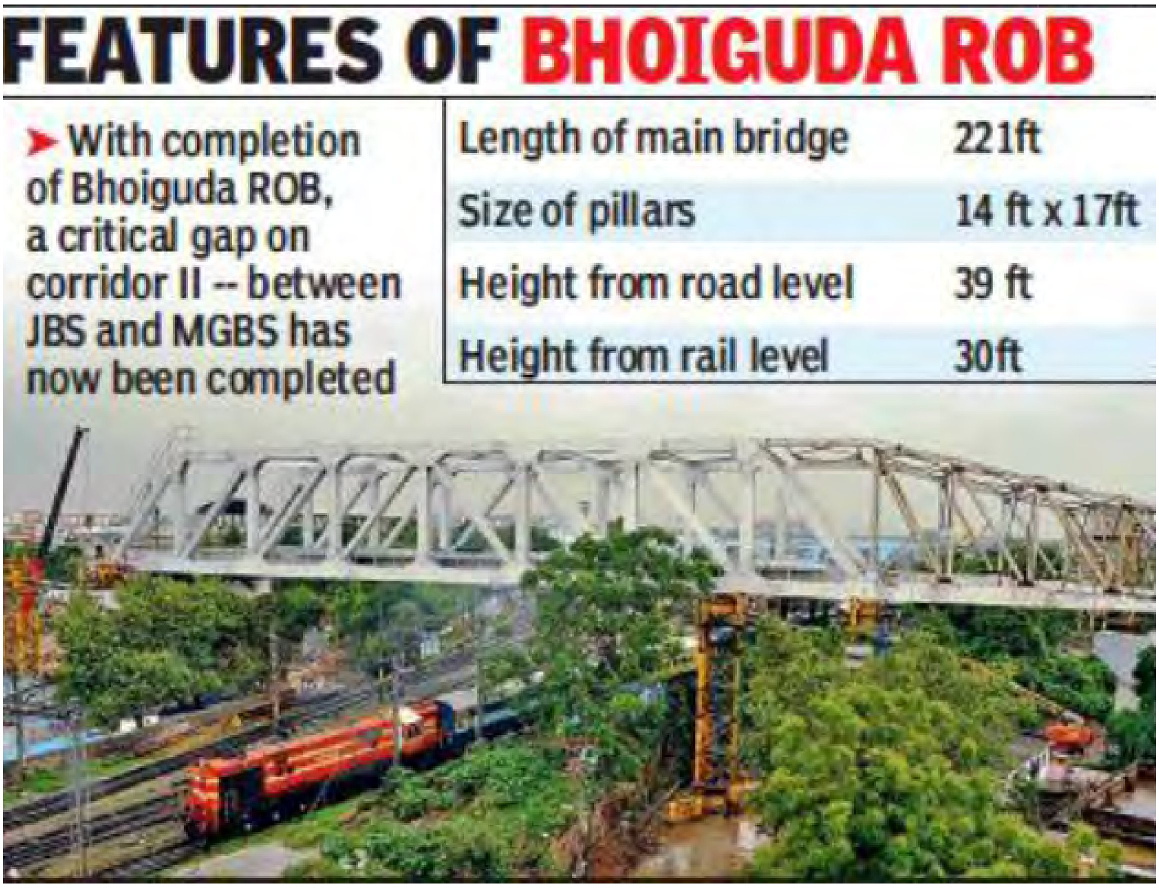
The malls at Punjagutta and Hitec City,(already 90 per cent of space is booked), at Erramanzil (80 per cent space is booked), and with regard to Moosarambagh, which is under construction (50 per cent space is occupied), Reddy said. With regard to the stations, he said 70 to 80 per cent space is already booked.

Hyderabad Metro Rail Over Bridge to unclog Bhoiguda Underpass; India

24 Jul. 2018 in Category(ies): Posted on Categories Hyderabad Metro, L&T Group in Rail and Metro Rail business, Metro Rail Systems

HYDERABAD: After tackling several hurdles, covering issues of space, location and engineering, the Hyderabad Metro Rail Limited (HMRL) authorities have successfully completed erecting a Metro Rail Over Bridge (ROB) at the narrow and congested Bhoiguda underpass, announced HMRL managing director NVS Reddy after inspecting the ROB.

With the ROB's completion which falls under Corridor – II (JBS-Falaknuma) of the Hyderabad Metro rail, L&T—the concessionaire for the Metro project has built 8 ROBs in across the city so far.



The entire steel bridge was manufactured in a special factory in Ghaziabad by simulating the site conditions at Bhoiguda. The structure was then dismantled and brought in special containers to the Old Gandhi Hospital premises in Monda Market area of Secunderabad, said authorities.

The entire steel bridge was then reassembled piece by piece, using high strength steel plates and about 51,000 imported HSFG (high strength friction grip) bolts, between Secunderabad West Metrostation (of Corridor – II) and Bhoiguda Road Under Bridge (RUB).

The reassembled steed bridge weighed nearly 960 MT and was slowly pulled using special pulling arrangements provided above the Metro pillar and on top of specially erected steep support structures.

"Due to the curvy nature of the rail track, which takes a sharp left turn over the existing Bhoiguda RUB of Indian Railways, the Metro ROB had to be designed as a very wide steel bridge with a width of 64 ft and a length of 221 ft at a height of about 40 ft over the road level in the shape of a box. Inside this box bridge, a composite deck slab — a mixture of steel and reinforced cement concrete slab is being laid to accommodate two tracks," said Reddy, on Sunday.

"The main launching operation was successfully completed in less than six hours of "traffic block" given by Indian railways during which train operations were suspended temporarily," he added.

Mumbai Metro-3: MMRC set to procure 248 Coaches, Alstom bags the Deal; India

20 Jul. 2018 in Category(ies): Posted on Categories ALSTOM, Mumbai Metro Rail System, Rail Enterprise, Industry, OEMs, EPCs, PFT & SME Sectors (incl. non-Railway PSEs under other Ministries) in Rail Business

Alstom Bags Contract To Supply 31 Metro Trains of 8 Coaches Each for Mumbai Metro Line-3. The first train is expected to be delivered by September 2020 and operations are likely to start by June 2021.

MUMBAI: The Mumbai Metro Rail Corporation (MMRC) is set to procure 248 coaches for the Metro 3 corridor from the consortium of ALSTOM Transport India Ltd and ALSTOM Transport S A France after it awarded them the contract on Thursday. All coaches would be manufactured in India and will be equipped with driverless technology.

"With the contract, we have reached an important milestone in the project. To cater to heavy passenger traffic and improve frequency of trains, the state-of-the-art Rolling Stock will also be equipped with Communication Based Train Control (CBTC) System having features of Driver-less Train Operations. The MMRC is thankful to GOI (Government of India) and (Government of Maharashtra) for their continuous support," said an MMRC spokesperson.

The first train is expected to be delivered by September 2020 and operations are likely to start by June 2021. As the project will be funded by Japan International Cooperation Agency (JICA), the contract was awarded after receiving its clearance.

The contract will involve designing, manufacturing, supplying, installing, testing and commissioning of 31 trains with eight coaches each. With a design life of 35 years, the trains would have a capacity of around 2,350 passengers (estimated at six passengers per square metre). It means each coach can carry around 300 passengers.

"The trains will operate on 25 kV AC traction supply. The car body material will be of stainless steel. Every car will have four doors on each side," said the spokesperson.

Being energy efficient with regenerative braking, these trains will have 75% motorization & LED lights. The Mumbai Metro-3 trains will operate on 25 kV AC traction & will carry 2,350 passengers each. The trains will be equipped with driverless technology, smart temperature & display control and will have safety features like CCTVs & help points to provide efficient, safe and comfortable commuting to passengers, according to MMRC.

Thales Cyber Security is Key Element in the Signalling Systems of Railway & Metro Rail Systems: EVP-Cyber Security of Thales; India

18 Jul. 2018 in Category(ies): Posted on Categories Indian Railways (IR), Interviews, Columns, Reviews, Opinions in Rail industry, IT, ICT, IOT, Cloud, Digital, Mobile Apps, FinTech, Artificial Intelligence, Machine Learning, Blockchain, Analytics, Telecom, Wireless, Cyber Security, Social Networking in Rail Sector, Metro Rail Systems, Rail Enterprise, Industry, OEMs, EPCs, PFT & SME Sectors (incl. non-Railway PSEs under other Ministries) in Rail Business, Thales

"We have no plans to sell standalone Cyber Security solutions in India, and our Cyber Security is key element of our Signalling Systems commissioned on Indian Railways & various Metro Rail systems" said Marc Darmon, Executive Vice-President of Secure Communications and Information Systems at Thales.

Marc Darmon, EVP-Secure Communications & Information Systems

KOLKATA: A cyber attack may happen within 20 days of detection of a breach in security or in hardware and it often takes nearly 200 days to upgrade the systems in the traditional set-up.

This could have been done on the first day itself. And, this is where French company Thales with its specialised expertise in cyber security can come in. Identify the loopholes and take corrective action, says ***Marc Darmon, Executive Vice-President of Secure Communications and Information Systems at Thales.***

Thales that caters to Defence, Civil and Railway sectors is looking to grow its presence in India.

Apart from these sectors, the four other verticals the company operates include Space, Aeronautics, Ground Transportation (Railways, Roads and Highways, Seaways), Security (including Cyber Security).

In an interview, Darmon talks about the company's India strategy with regard to cyber security and privacy issues. Edited excerpts:

Q: What's your strategy on India in general and Indian Railways and Metro Rail sectors in particular, when it comes to Digital Security?

Darmon: We have a very strong base. And with the 150-odd people from Guavus (a real-time big data processing company that Thales acquired), we have a data analytics platform. And, as you know data analytics forms the basis of cyber security as it allows detection of abnormal behaviour or threats. As a business, we limit our cyber security offerings to wares we sell in India. By that I mean when we sell signalling systems to an Indian mainline Railway segment or Metro Rail sector, we use cyber security in it a key element of our offer. But, so far, we do not address Indian companies directly to sell cyber security solutions to them. We sell only through Thales' systems.

Q: Can you briefly explain about your Signalling Solutions for the Railways and Urban Mobility sectors in India business?

Darmon: Our trusted, proven urban signalling solutions will boost the performance of your existing network without disrupting operations or help you start your new network right.

Communications-Based Train Control (CBTC) – Thales literally invented CBTC in the 1980s and today our fully automated, integrated and upgradeable **SelTrac™ CBTC**

continues to lead the industry. Freed from the limitations of conventional fixed-block designs, you can move more people, more quickly, without compromising safety. SelTrac™ also has a green configuration that consumes 15% less energy. Built to be flexible, SelTrac™ addresses all of your requirements and with optimised maintenance and life cycle costs.

Street-level signalling provides tailored solutions for your tram and light rail networks, including signalling for lines and depots, priority management at road crossings, automatic vehicle localisation and tram regulation.

Route Control Systems – Thales LockTrac electronic interlocking systems ensure smooth and safe movements by managing point machines, signals, crossings and other network elements.

Traffic Management Systems – Put more trains on existing tracks with the help of our **NetTrac ARAMIS** (Advanced Railway Automation Management & Information System), which automatically detects conflicts and proposes operational solutions so that any incidents can be quickly managed.

Rail Field Equipment – Our **FieldTrac** family of trackside equipment includes axle counters, point machines, LED signals, automatic warning devices and more.

Q: Why have you stayed away from direct selling of cyber security solutions to Indian companies?

Darmon: India is huge market, but there are a lot of Indian companies already present in this segment.

Our cyber security business is two-fold. One is to corporations and that is only €1.5 billion; and there is also key technology that is a part of what Thales' is doing, a part of its air traffic management systems and so on. In the case of India, we didn't feel the need to address Indian corporations directly. It could be a partnership with Indian companies. However, if you see (verticals like) air traffic management, defence and so on, then our cyber security solutions are already present.

Q: So do you intend to sell standalone cyber security solutions any time soon?

Darmon: Not in the very short term.

Q: Today's discussion on cyber security also covers third party applications that gain access to user data or breach of privacy issues. What is your take and can Thales work in preventing that?

Darmon: Where data is compromised, we have a team of people who are like ghostbusters. They probe the causes of the leak and try and take preventive action. They also determine how safe the systems are, part by part. But, this is in case of a general attack. When there is a compromise or a set of leakages, our approach is different. There is nothing to correct. Everything is working well. So what we do is redefine the security policy. In these cases we try and determine what is the data that needs to be protected, who has access to what and what type of protections are needed. This then becomes a business of expertise and we can look at selling solutions related to encryption, diodes, software and hardware.

Mumbai Trans Harbour Link to be ready by 2022: Japanese Diplomat; India

12 Jul. 2018 in Category(ies): Posted on Categories Japanese International Cooperation Agency (JICA), Mumbai Trans Harbour Link (MTHL), Rail Pacts, Deals, MOUs, Joint Ventures/SPVs, Bilateral, Diplomacy, Collaborative, Cooperative and Framework Agreements in Railway Industry

The Japanese diplomat also said India has already received Rs 22,000 crore assistance under Japan's Overseas Development Assistance.

MUMBAI: The ambitious Mumbai Trans Harbour Link (MTHL) work on which started in April, will be completed by 2022, said Japanese Consul-General in Mumbai Ryoji Noda on Wednesday.

For the 22-km six-lane bridge along the Mumbai harbour to the mainland providing direct access to the upcoming new international airport and the Mumbai-Pune Expressway, Japan is a partner with a commitment of Rs 9,000 crore or nearly 80 percent of the estimated project cost of Rs 14,260 crore, through the Japan International Cooperation Agency (JICA).

Besides the MTHL, Japan has committed Rs 4,500 crore for the 33.5-km-long Mumbai-Metro 3 project running from Colaba-Bandra-SEEPZ, for which 5.1 kms of underground tunneling work has just been completed, as per an announcement by the Mumbai Metro Rail Corporation. The line, with 27 stations en route, is expected to be completed by December 2021.

Referring to the Bullet Train project being constructed with Japanese assistance, Noda said the "high speed rail project between Mumbai-Ahmedabad is important for us (Japan)".

Speaking at a convention organized by the Confederation of Indian Industry (CII) here, he said the project would ensure trust and safety of the users, responsible and timely disbursement in construction and safety net around the same.

Estimated to cost Rs 1.1 lakh crore ($16 billion), the work on the Bullet Train project has already been initiated in Maharashtra and Gujarat, creating a huge controversy with strong resistance from various quarters including the villagers, tribals and opposition parties.

The Japanese diplomat also said India has already received Rs 22,000 crore assistance under Japan's Overseas Development Assistance, making it the largest beneficiary, with Mumbai as one of the focus areas, adding that his country would support Indian in various fields including investments, technology transfer and handling air, water, sea pollution besides managing urban waste.

"There are estimates that Mumbai is expected to be the highest populated city in the world in the highly populated country in 2032," Noda said.

He pointed out that if Mumbai creates 7,000 tonnes of urban waste daily, it amounts to 210,000 tonnes every month and Japan, which recycles 85 percent of its pet bottles, can help India to better handle the urban waste.

Other prominent speakers at the conclave included industrialist and Godrej Group Chairman Jamshyd Godrej and JICA India Chief Representative Katsuo Matsumoto.

PART II: ACTIVITIES FOR URBAN MOBILITY SOLUTIONS INTERNATIONAL

World Report on Metro Automation; International

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July. 2016

Automated Metro lines are a proven solution for metro systems around the world. As of July 2016, there are 55 fully automated metro lines in 37 cities around the world, operating in total 803km, a 14,2% increase in km over 2014 figures. The projection is that by 2025 there will be 2,300km of automated metro lines in operation. This report offers a general overview of metro automation, covering line characteristics, technological trends, supplier market share and estimated future evolution.

The avant-garde of metros, fully automated metro lines are a window into the future of all metro systems. This report covers the complete field of fully automated metro lines in public transport operation in the world. The analysis of these flagship lines, some of them in operation for several decades, offers a unique opportunity to operators, authorities and industry suppliers to better understand the future evolution of metro systems.

CONTACT: Miryam Hernandez, Manager Metro Division: miryam.hernandez@uitp.org

Statistics brief: Metro automation in the world (EN)
Statistics brief: Metros automáticos (ES)

World Report on Metro Automation

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ADVANCING PUBLIC TRANSPORT

STATISTICS BRIEF

WORLD REPORT ON METRO AUTOMATION - JULY 2016

INTRODUCTION

Automated metro lines are a proven solution for metro systems around the world. As of July 2016, there are 55 fully automated metro lines in 37 cities around the world, operating in total 803 km, a 14,2% increase in km over 2014 figures. The projection is that by 2025 there will be over 2,300 km of automated metro lines in operation. This report offers a general overview of the state of the art in metro automation, covering line characteristics, technological trends, supplier market share and estimated future evolution.

Cities with fully automated metro lines in operation as of 15 July 2016

The avant-garde of metros, fully automated metro lines are a window into the future of all metro systems. This report covers the complete field of fully automated metro lines in public transport operation in the world. The analysis of these flagship lines, some of them in operation for several decades, offers a unique opportunity to operators, authorities and industry suppliers to better understand the future evolution of metro systems.

METRO AUTOMATION IN 2016

There are currently 55 fully automated metro lines, operating public transport services over 803 km. Together they serve 848 metro stations in 37 cities across the world: 23% of the cities with a metro network have at least one fully automated metro line in operation (see box).

OVERVIEW: CONVENTIONAL VS AUTOMATED METROS

Nearly a quarter of the world's 157 metro cities have at least one line operating in full automated mode - in km, this represents 6% of the world's metro infrastructure. This development took place in the last 30 years, a relatively short time span when considering the 153 years of metro history.

The analysis at a regional level shows that the share of fully automated metro lines is significantly higher in Middle East and Europe, where fully automated lines represents respectively 15% and 10% of their metro infrastructure.

In Asia, the leading world region for automation, automated lines represent 5% of the km of metro in the region– a consequence of Asia's large metro market, and of the late adoption of automation in China.

AUTOMATION IS A GLOBAL SOLUTION

Asia and Europe together are home to close to 75% of the km of fully automated metro lines (see figure 1), followed by North America (13 %), which was in fact one of the pioneering regions in metro automation. In the last decade, both Latin America and the Middle East have developed fully automated lines, with the Middle East showcasing one of the higher rates of growth.

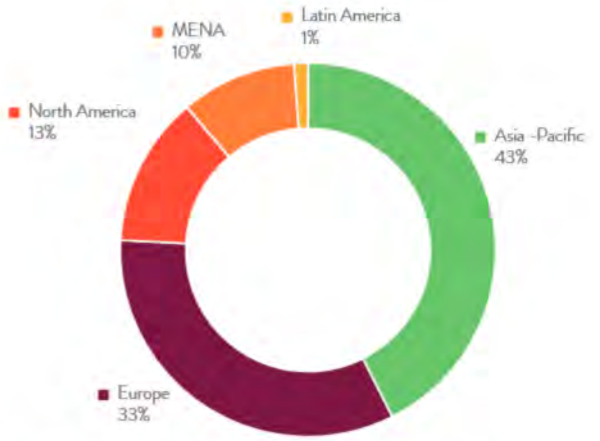

Figure 1: % of km of automated metro lines per world region

Half of the world's fully automated metro infrastructure is concentrated in 4 countries: France, South Korea, Singapore and the United Arab Emirates. France continues to lead the ranking with 16% of the world's km of fully automated metro lines, followed closely by South Korea (15%). (See figure 2)

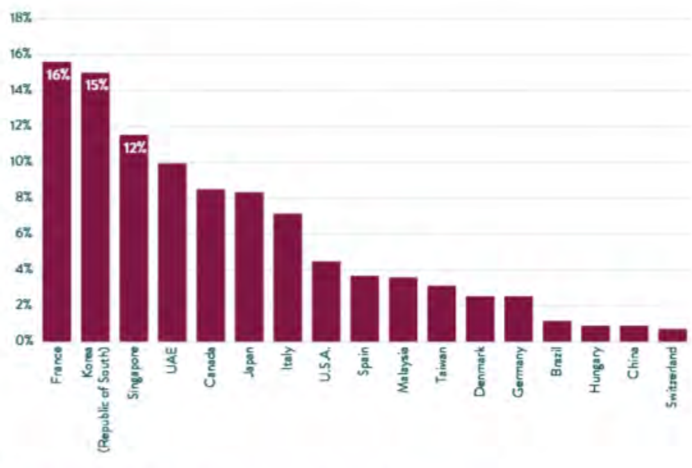

Figure 2: % of km of fully automated metro lines per country

The three cities with the most km of metro operated in automated mode are outside Europe – Singapore (93 km), Dubai (80 km) and Vancouver (68 km) - as depicted in figure 3.

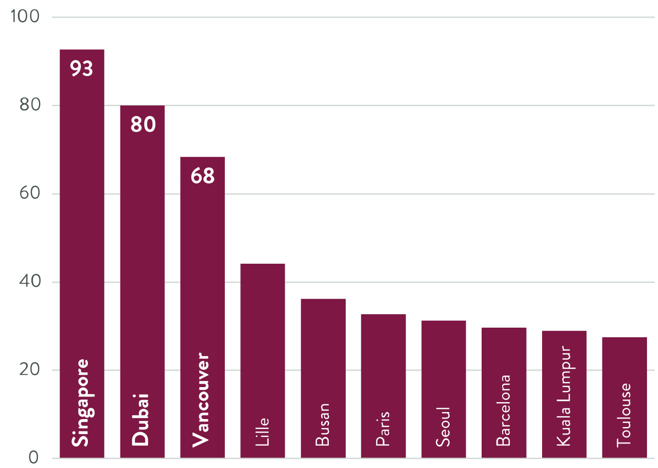

Figure 3: Top 10 cities with fully automated automated metro lines (km in operation per city)

The diversity of urban scenarios that represent the above figures highlights the flexibility of full driverless metro operation: automated lines have been deployed now in 37 cities around the world, depicting very different mobility needs and demographic contexts. This demonstrates that fully automated metro solutions are not limited to one type of city, mobility pattern or culture.

One of the recurrent questions raised by decision makers concerning automation is public opinion – in particular citizen's reaction to a train without a driver on front. The variety of cultural contexts in which full metro automation has been successfully deployed demonstrates this is not a real barrier. Another clear indicator on the acceptance of automation is that when a city builds an automated metro line, it never opts for building subsequent lines in conventional, manual operation.

CHARACTERISTICS & TRENDS

Capacity

Although fully automated metro solutions were initially deployed in low capacity lines, growth in the last decade corresponded mostly to medium and high capacity systems (see figure 4). Currently, close to 80% of the world's automated metro infrastructure correspond to medium and high capacity lines, when considering the capacity of the trains. Most high capacity lines are deployed in Asia and Europe (see figure 5), with the significant exception of São Paulo's Line 4 in Latin America: with over 32,000 passengers per hour per direction, it is one of the most heavily loaded lines in the world.

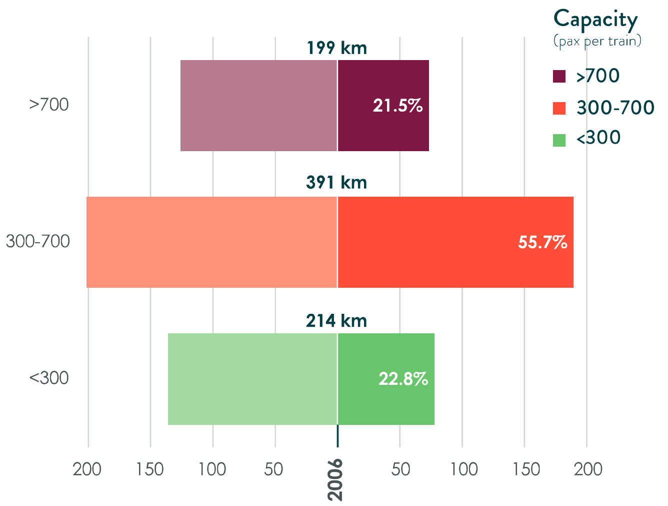

Figure 4: Km of automated lines per train capacity & % of growth in the last decade

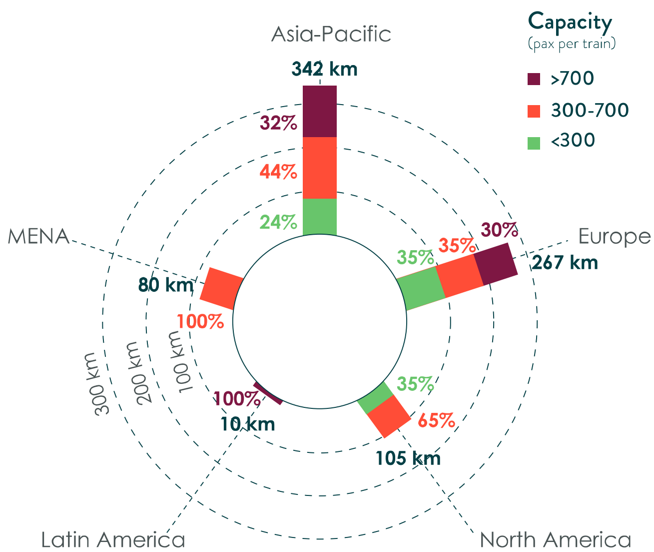

Figure 5: % of km of automated metro lines per world region - train capacity

Signalling technology

CBTC has consolidated as the preferred signalling solution for fully automated metro lines. Currently, 68% of the world's km of automated metro lines are operated using CBTC systems and even more significantly, close to three quarters of the new fully automated metro infrastructure built in the last decade was equipped with CBTC (see figure 6).

Thales, with close to 250 km of automated metro lines equipped, is the market leader for fully automated metro lines, closely followed by Siemens (see figure 7).

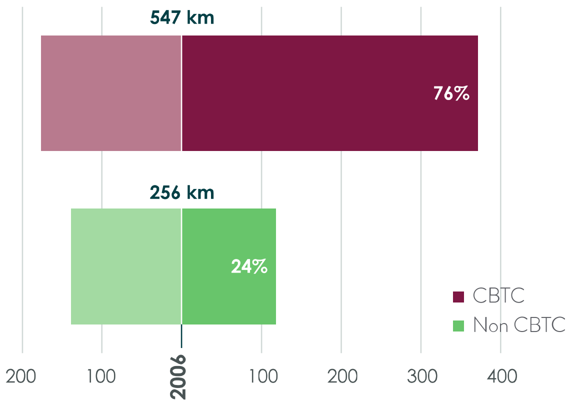

Figure 6: CBTC vs non-CBTC signalling solutions for fully automated lines (km equipped & percentage of growth in the last decade)

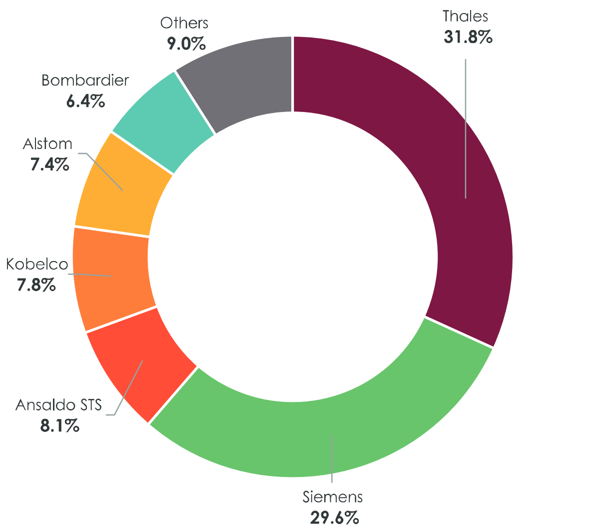

Figure 7: Signalling suppliers for fully automated metro lines (% of km equipped)

Platform track protection systems

The safety of the platform/track interface is crucial for fully automated metro lines. The installation of Platform Screen doors remains the dominant solution over track intrusion detection systems (see figure 8) since they prevent persons and objects from falling on the track, improving the performance of the line. Currently, 76% of stations in automated metro lines in operation are equipped with platform screen doors, a trend that is confirmed by the evolution in the last decade: only 15% of the stations inaugurated since 2006 are protected with intrusion detection systems.

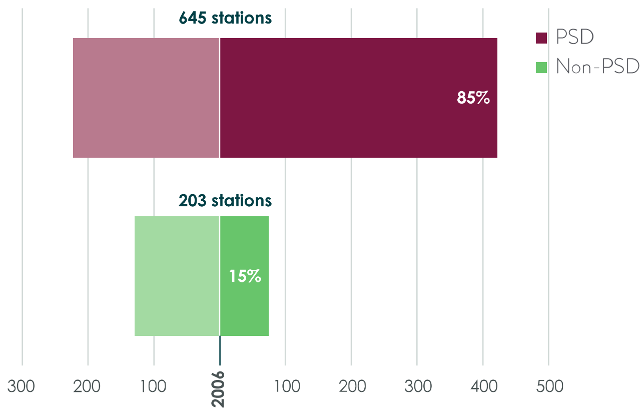

Figure 8: Platform Screen Doors vs. non-PSD (total stations equipped & percentage of growth in the last decade)

Rolling stock market

As of 2016, 10 rolling stock suppliers serve the market for fully automated metro lines. Bombardier, Alstom and Siemens are the leading suppliers; serving with their trains close to 60% of the km of fully automated metro in operation (see figure 9). Asia is the most diversified market, with lines equipped by 9 different suppliers and no dominant market leader, whereas for Europe, North America and the Middle East, the market is concentrated in 3 or 2 suppliers.

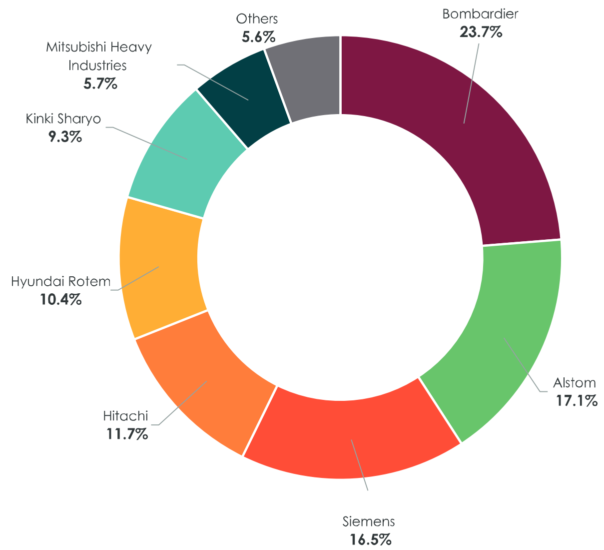

Figure 9: Automated rolling stock suppliers (share of km equipped)

Construction model

There is no predominant alignment solution for automated metro lines; underground and elevated stations are fairly equally split, as depicted in figure 10. Over 60% of the stations inaugurated in the last decade, however, correspond to underground alignment. When considering the wheel/rail interface system, a majority of lines opt for steel wheels, as opposed to rubber-tyred trains: in the last decade, close to 70% of the km of new automated metro used steel wheel systems.

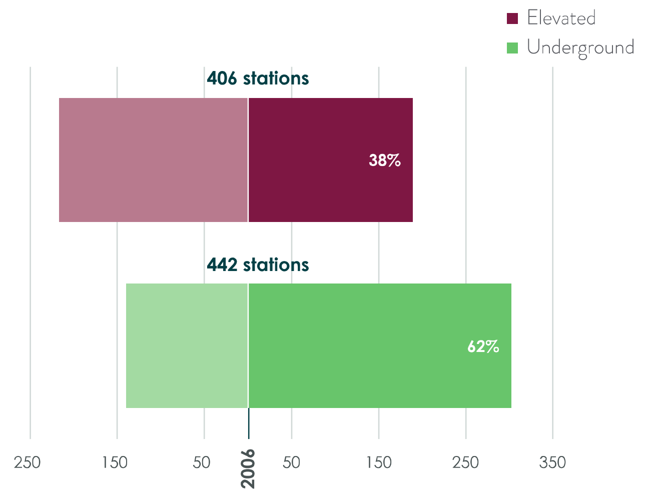

Figure 10: Constructive model - underground vs. elevated (number of stations & percentage of growth in the last decade)

FUTURE GROWTH

In the 30 years since the implementation of the first automated metro lines, the growth rate for automated metro has doubled with each passing decade – an exponential growth that is set to quadruple in the coming decade. Current forecasts, based on confirmed projects, indicate that by 2025 there will be over 2,300 km of fully automated metro lines in operation (figure 11).

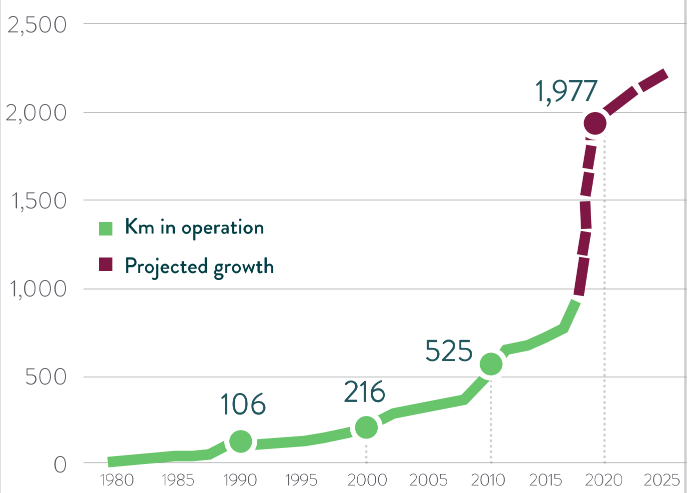

Figure 11: Total growth in automated metros (km of lines operated in full automated mode)

THE CASE FOR CONVERSION

Conversion of metro lines from conventional to fully automated operation is a complex project that requires careful timing to ensure the technical and financial viability of the project.

The signalling upgrade must be complemented with a significant modification or the renewal of the rolling stock fleet and the retrofitting of platform-track protection systems at stations. When timed appropriately with the end of the life cycle of the existing assets, the investment can be recovered in a relatively short time (within a decade). Conversion projects must also consider and address from the beginning the organisational implications of full automated operation for the company, and involve staff at all company levels since the early stages of the project. Following the successful conversions of U2 in Nuremberg in 2009 and L1 in Paris in 2012, six European cities have confirmed conversion projects in the coming decade: Glasgow - G. Subway, London - Docklands, Lyon - LA & LB, Marseille - L1 & L2, Paris - L4, Vienna - U5.

This growth will mainly concentrate in the Middle East, Europe and Asia (see chart 19) – together they will account for 88% of new km of automated lines, with Latin America accounting for another 11% of the total projected growth. Significantly, 26% of the new km in Europe will correspond to conversion projects (see box).

In 2025, Asia and Europe are expected to account for 33% and 30% of the world's km of automated metro lines respectively, followed by the Middle East: thanks to its elevated growth rates, it will represent 25% of the world's km of automated metro. China announced the opening of two new fully automated lines for the end of 2017 - one of them built using exclusively Chinese technology. This significant development may translate in even higher growth rates if China embraces full automation for its many expanding systems.

Figure 12: Current length of automated metro lines and projected growth for the next decade, per world region

Current length of infrastructure for automated metros

Projected growth (2025) in infrastructure

CONCLUSION

The three decades of automated metro operation around the world summarised in this brief demonstrate that full automation is a consolidated solution - one that brings many advantages to operators, authorities, and users.

Fully automated metro lines offer increased safety, unrivalled reliability and the capacity to respond flexibly to surges in demand. For operators, automation has the potential to be a lever of change to develop new organisational models, enriching job profiles and more efficient maintenance and operation. Building on these strengths, metro operating companies are able to offer better service to their customers and respond efficiently to their increasingly changing mobility needs, raising the attractiveness of public transport and ultimately contributing to improving the quality of life in our cities.

Full automation brings therefore the opportunity to generate a step change for metro systems and a more sustainable urban mobility. The exponential growth trend observed in this report, set to quadruple in the coming decade, confirms that increasingly authorities and operators around the world are ready to take the leap towards this new referent in metro service and operation.

This report covers exclusively fully automated metro lines, defined as those metro lines in which trains can be operated without staff onboard - a defining characteristic is the absence of a driver's cabin on the train. This type of operation is also known as Unattended Train Operation (UTO), or Grade of Automation 4 in standard IEC 62267 (see table below). Moreover, only lines in public transport service have been considered.

Grade of Automation	Type of train operation	Setting train in motion	Stopping train	Door closure	Operation in event of disruption
GoA1	ATP* with driver	Driver	Driver	Driver	Driver
GoA2	ATP and ATO* with driver	Automatic	Automatic	Driver	Driver
GoA3	Driverless	Automatic	Automatic	Train attendant	Train attendant
GoA4	UTO	Automatic	Automatic	Automatic	Automatic

**ATP - Automatic Train Protection; ATO - Automatic Train Operation*

The data in this Statistics Brief is sourced from the global database of automated metro lines of the UITP Observatory of Automated Metros. This Observatory gathers the world's leading operators with experience in full automated metro operation. It exchanges best practices in key issues affecting automated metro operation and monitors the global evolution and trends on this field. For more information on the Observatory work, and further content on metro automation, consult the Observatory website: www.metroautomation.org. Contact: Miryam Hernandez - miryam.hernandez@uitp.org

This is an official **Statistics Brief** of UITP, the International Association of Public Transport. UITP has over 1,400 members in 96 countries throughout the world and represents the interests of key players in this sector. Its membership includes transport authorities, operators, both private and public, in all modes of collective passenger transport, and the industry. UITP addresses the economic, technical, organisation and management aspects of passenger transport, as well as the development of policy for mobility and public transport world-wide.

This Statistics Brief was prepared by the Observatory of Automated Metros. Data is valid as of 15 July 2016.
This brief was modified in September 2016 to include updated information on Guangzhou and Singapore lines.

JULY | 2016

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METRO Newsletter by Dr. F.A. Wingler
METRO 24, January 2019

Alstom Hydrogene Fuel-Cell powered Commuter Rail; UK

ACTIVITIES FOR URBAN MOBILITY SOLUTIONS INTERNATIONAL

Ottawa to get Keys to new light-Rail Line by March 31 after multiple Delays; Canada

Written by Paul Conley, Editor-in-Chief

City of Ottawa

The consortium building Ottawa's light rail transit (LRT) Confederation Line says it will finish construction work in the first quarter of 2019.

The new date was announced Thursday evening in a memo to the city council from rail construction program director Michael Morgan. Ottawa had expected the consortium, Rideau Transit Group (RTG), to provide a new handover date for the $2.1 billion LRT line on Wednesday, Jan. 2. But RTG requested more time. Ottawa gave RTG a one-day extension.

RTG had twice before missed deadlines — in May and November of last year. After missing the November deadline, RTG was hit with a $1 million penalty.

Some of the biggest names in the rail and construction industries are participants in RTG, including ACS Infrastructure Canada, EllisDon, SNC Lavalin, Alstom, Thurber Engineering, et al.

Under the terms of the city's contract with RTG, the consortium is to complete all civil work, construction of mechanical and electrical systems, delivery of all light rail vehicles, erect all signage and wayfinding systems, install the in-train announcements and public announcement system, secure safety certifications, reach compliance with an independent safety audit, and successfully complete trial runs.

The Confederation Line is the first phase of a plan to install light-rail around the city. The Confederation Line will connect to the existing Bus Rapid Transitway at Tunney's Pasture Station in , and to the O-Train at Bayview Station. A central feature of the Line is a a 2.5-km tunnel under the city's downtown, which officials hope will reduce congestion.

Much of the delay can be traced to the development of a sinkhole on Rideau Street in June 2016. Tunneling in wet, sandy soil led to a collapse that ruptured a water main and flooded the Rideau Street station. It took 3,000 cubic metres of concrete to fill the hole and stabilize the tunnel enough that construction could resume, according to the Ottawa Citizen newspaper.

Work on the line does now appear to be close to completion, based on updates posted to the Confederation Line's website. Multiple trains were running a closed loop between Blair and Tunney's Pasture Station in full Automatic Train Operation (ATO), by mid-December. The track and Overheard Catenary System (OCS) were certified for operation by November.

Categories: Bridge/Retaining Walls/Tunnels, C&S, EOI/RFP/RFQ, News, Passenger, Rapid Transit/Light Rail, Track Structure.

Tags: Alstom, city of Ottawa, EllisDon, SNC Lavalin, Thurber Engineering

Funding approved for Milan Metro Extension; Italy

Jan. 4, 2019

Written by David Briginshaw

THE Italian Government has agreed to contribute €900m towards the cost of building an extension to Line 5 of the Milan metro, while Lombardy region will provide the remaining €350m..

Milan Metro's fully-automated Line M5 will be extended north to Monza.

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The national government will fund its share in tranches starting with €15m this year, €10m in 2020, €25m in 2021 with further amounts allocated in the following years up to 2027.

The project will double the length of Line M5 by adding a 12.8km northern extension from Bignami to Monza FS station. There will be four stations in Cinisello Balsamo and seven in Monza.

Construction is planned to start in 2021 with completion foreseen in 2026. Milan is bidding to host the 2026 Winter Olympic Games.

An additional 11 trains will be needed to operate the extended line. Line 5, which was completed in 2015, is fully automated with driverless operation.

For more information on global metro projects, subscribe to IRJ Pro.

Categories: EuropeMetrosNews
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- January 04, 2019
- Light Rail, News, Passenger

Hoops Tournament helped Kansas City Streetcar Growth in 2018; USA

Written by Stuart Chirls, Senior Editor

Photo: KC Streetcar

KC Streetcar ridership continued to grow steadily in 2018, including its best-ever one-day total since opening in 2016.

Ridership on the fare-free system logged seven straight months of year-over-year monthly growth for a total of 2,114,886 rides, up from 2,060,327 in 2017. The streetcar marked its five-millionth ride in September and its highest one-day ridership on July 6, with 19,181 trips.

The system has totaled more than 5.5 million rides since opening day in May 2016.

“The steady increase in streetcar ridership is a direct reflection of the residential and employment growth downtown,” said Tom Gerend, executive director of the KC Streetcar Authority. “For every new housing unit built, the KC Streetcar gains another rider. More streetcar riders equal more downtown activity and a direct downtown economic impact.”

In 2018 ridership statistics included:

- 5,794 average daily ridership
- 31,009 trips during the Big XII Basketball Tournament in February
- 33,424 trips during the three-day Labor Day weekend
- 262,593 trips in July
- 169,254 trips in December, up 19,000 on-year

The authority plans to add two new Urbos 3 cars from CAF in 2019, growing its fleet to six vehicles, which it expects to decrease waiting times and expand capacity during large-scale downtown events.

Categories: Light Rail, News, Passenger Tags: Breaking News, CAF USA, KC Streetcar, KC Streetcar Authority

- January 07, 2019

- Commuter/Regional, Intercity, News, Passenger

In Britain, Hydrogen is a Breeze; UK

Written by Keith Barrow, Senior Editor, International Railway Journal

Alstom and rolling stock leasing company Eversholt Rail have unveiled a concept for a hydrogen multiple-unit (HMU) for the British market that involves converting existing EMUs (electric multiple-units) for operation on non-electrified routes. The concept, dubbed Breeze, involves reengineering class 321 EMUs originally built by British Rail Engineering Limited in 1988-1991. Most of the fleet of 117 trains is due to come off lease within the next few years due to the delivery of new equipment.

Alstom and Eversholt Rail say they are working closely with industry stakeholders to develop the business cases and evaluate detailed introduction plans for the trains and fueling infrastructure. An initial engineering study has been completed and the design concept has been finalized.

The *Breeze* conversions will be carried out by Alstom at the company's Widnes facility in northwest England, and the manufacturer says the first completed train could be in operation by 2022.

Alstom Hydrogene Fuel Cell powered Commuter Rail

Alstom has previously said the trains will have a range of 1,000 km (620 miles) and a maximum speed of 140 kph (87 mph).

The news follows the introduction in September 2018 of Alstom's Coradia iLint hydrogen trains in Germany, where they now operate in regular daily passenger service. "There is growing interest in Alstom's hydrogen technology worldwide, including in France where the President of the Occitanie region, Carole Delga, recently announced a proposal to introduce the technology on trains there," the company said.

"Hydrogen train technology is an exciting innovation that has the potential to transform our railway, making journeys cleaner and greener by cutting CO2 emissions even further," said UK Rail Minister Andrew Jones, MP. "We are working with industry to establish how hydrogen trains can play an important part in the future, delivering better services on rural and inter-urban routes,"

"Transport in the UK has evolved over centuries from the world's first steam train to the tens of thousands of electric vehicles on our roads today thanks to our nation of innovators," said UK Minister for Energy and Clean Growth Claire Perry, MP. "This new hydrogen-powered train, which will only emit water, is further proof of the UK's continued creativity to transform the way we travel as we continue to move to a greener, cleaner economy. The UK is on track when it comes to growing a world-leading hydrogen economy, and through our modern Industrial Strategy, we are providing £23 million to power our ambition to be the 'go-to' place for first-class hydrogen transport."

"The *Breeze* will be a clean new train for the UK with a stylish, modern look," said Alstom UK & Ireland Managing Director Nick Crossfield. "The railways need to decarbonize and the government has rightly set out a goal to eliminate diesel rolling stock by 2040. Hydrogen trains offer an ideal solution for routes that are unlikely to benefit from electrification, and our innovative engineering solution means they can now fit within the UK loading gauge and can quickly be ready to roll on Britain's railways. In Germany, Alstom's hydrogen trains are already transporting passengers in the comfort and quiet that is characteristic of these trains. The *Breeze* offers British rail users the opportunity to share in the pleasure that is a journey on a hydrogen train."

"Eversholt Rail has an enviable record of innovation across its rolling stock portfolio," said Eversholt Rail Client Relations Director Stephen Timothy. "Combining the experience gained from the successful Coradia iLint and Class 321 Renatus programs will deliver a hydrogen-powered multiple-unit product that will meet sponsors' and train operators' aspirations for the earliest possible fleet introduction."

Categories: Commuter/Regional, Intercity, News, Passenger Tags: Alstom, Alstom Breeze, Breaking News, Coradia iLINT, Eversholt Rail

Design-build Contract awarded for Dallas Commuter Rail; USA

Written by Keith Barrow, Senior Editor, International Railway Journal

Dallas Area Rapid Transit (DART) has awarded a joint venture of Archer Western Construction and Herzog Contracting a $783 million design-build contract for the 26-mile Cotton Belt commuter rail line.

DART has also awarded WSP a contract to provide design review and construction management services for the $1.1 billion project, include coordination and oversight of the design-build joint venture.

The double-track line from Dallas/Fort Worth International Airport and Shiloh Road in Plano will connect the northern suburbs of Tarrant, Dallas, and Collin counties along Interstate-635, one of Texas' most congested road corridors.

The double-track line will serve 10 stations in the cities of Grapevine, Coppell, Dallas, Carrollton, Addison, Richardson and Plano, including interchanges with the DART light rail Orange, Green and Red lines, the TEXRail commuter line to Fort Worth, and local bus services.

Services will be operated by a fleet of at least seven DMUs, which will be maintained at a purpose-built facility.

Construction will begin next year with the line scheduled for completion by December 2022.

Categories: Commuter/Regional, News, Passenger Tags: Breaking News, Dallas Area Rapid Transit, DART, Herzog Contracting Corp, TexRail, WSP

Paris Line 6 to get ATO; France

23 Apr. 2018

The MP89 trainsets being cascaded from Line 4 will replace the MP73 sets currently operating on Line 6. (Photo: DXR/Wikimedia Commons)

FRANCE: Paris metro operator RATP has selected Alstom to install GoA2 automation on the east-west Line 6, which serves 28 stations between Etoile, Denfert-Rochereau and Nation.

Under a contract announced on April 23, Alstom will supply its **radio-based I-CBTC**, which has already been installed on lines 5 and 9. The company will be responsible for retrofitting 47 Type MP89 rubber-tyred trainsets, which will be cascaded from Line 4 following the automation of that route, together with the related track-to-train radio transmission system.

I-CBTC was developed by Alstom to meet RATP's **OCTYS interoperability specifications (Open Control of Trains, Interchangeable & Integrated System)**, which were drawn up to ensure compatibility between the ATO systems on various lines, following the signing of agreements with Ansaldo STS, Areva and Siemens in 2004. Interoperable systems have been installed on five lines (3, 5, 9, 10 and 12), while Line 13 has a different ATO system supplied by Thales under the Ouragan programme. Lines 1 and 14 are equipped for driverless operation to GoA4, which is now being rolled out on Line 4.

I-CBTC controls the traction and braking systems for station-to-station operation, with the driver supervising passenger boarding at each station before initiating departure. The **OCTYS** standards also provide for the fully automatic reversal of empty trains at terminal stations.

I-CBTC onboard equipment has already been fitted to around 130 Type MF01 steel-wheeled trainsets used on lines 5 and 9, and will be fitted to the new MP14 trains being delivered for Line 11 under a contract awarded in mid-2017. According to Alstom, the combined value of the Line 11 and Line 6 contracts is more than €90m.

Overall engineering for the project will be undertaken at Alstom's premises in Aix-en-Provence, where the onboard systems will be produced. Engineering for the radio transmission system and ground-based equipment will be undertaken in Saint-Ouen, which will also be responsible for the testing and commissioning, while Villeurbanne will provide the radio equipment.

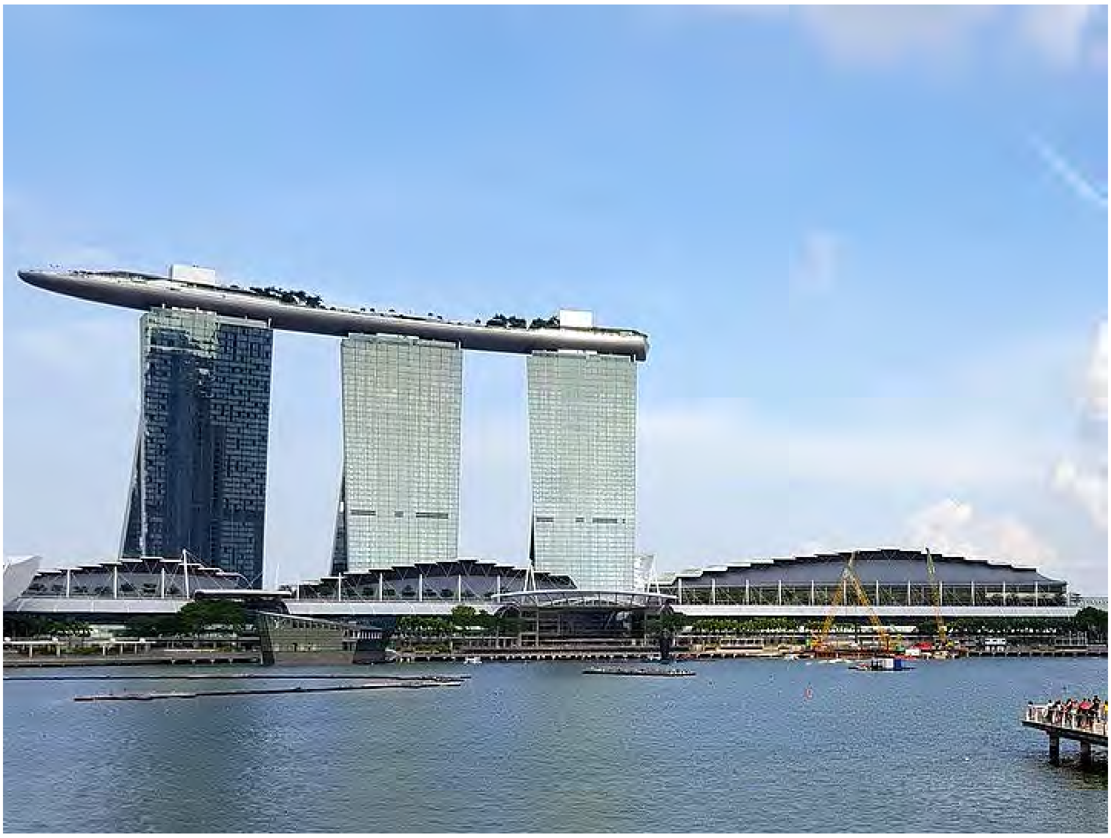
'We are delighted that the RATP has once again renewed its trust in our teams and our solutions', said Patrice Hassib, Vice President of Alstom's French signalling business. 'Alstom is again becoming a significant player in the RATP signalling market.'

Related news

- 03 May 2018 - Grand Paris selects supplier for up to 1 000 driverless train cars
- 06 Apr 2018 - Ansaldo STS wins Paris metro CBTC contract
- 20 Feb 2018 - Alstom to replace Paris metro Line 11 fleet
- 07 Feb 2018 - Automation speeds up metros
- 10 May 2017 - ATO goes live on Paris RER Line A
- 07 Jan 2016 - Siemens to automate Paris metro Line 4

Digital Transport and the Challenges of Urbanisation; Singapore

19 Jul. 2018



The 2018 edition of the Singapore International Transport Congress & Exhibition took place in early July.

Digitalisation was the key topic of the SITCE conference in Singapore, held for the first time as part of the World Cities Summit.

Singapore is ‘a champion of public transport and a model for metro networks’, according to UITP President Pere Calvet, while World Bank CEO Kristalina Georgieva lauds it as ‘a good example of the ways in which people can solve the problems facing large cities’. The two speakers were not the only ones praising the host city of the World Cities Summit, which took place in early July.

For the first time, the event incorporated UITP and Land Transport Authority’s Singapore International Transport Congress & Exhibition. The theme of SITCE was ‘people at the heart of digital railways’, and while the event was based around UITP’s Rail Conference, there was much talk of other forms of mobility. A total of 630 delegates attended, alongside some 50 exhibitors.

The integration of SITCE into WCS is logical, given the central role that transport plays in cities. In the WCS opening plenary Georgieva said public transport is ‘absolutely essential’ if cities are to be green and accessible. Cities produce 60% to 80% of all carbon dioxide emissions, leading Georgieva to warn that ‘if cities do not change, we are doomed!’ Accessibility is crucial too: growing urban populations need to access the jobs that cities create.

Half the world’s population is already urban, and the UN forecasts that this share could rise to as much as 90% by 2050. Singapore’s Deputy Prime Minister Tharman Shanmugaratnam picked out poorly planned urbanisation, climate change and growing young populations as among the biggest challenges faced by cities today. Similar thoughts were expressed throughout the conference: Mastercard’s Gerald Sun, for instance, said that global megatrends are responsible for many cities’ common problems, which cannot be solved simply through spending money.

The need for sustainable urban development was stressed by China’s Vice Minister of Ecology & Environment Zhuang Guotai. The country has overhauled its environmental laws in response to worsening pollution, and these measures are having an effect. Zhuang said that Beijing residents were initially opposed to restrictions on private cars entering the city — until they saw the consequent reduction in air pollution.

Andhra Pradesh Chief Minister Chandrababu Naidu wants to go even further and make the city of Amaravati carbon-neutral. To achieve this, he envisages only zero-emission vehicles operating in the city.

Naidu sounded an optimistic note about technology shaping the future of cities. Digital technologies such as the internet of things enable people to do what they want in real time. But while this is ‘an inspiring time’, we need to be careful, he said, as ‘misuse of technology can make things miserable for everyone.’

Not just a Buzzword

‘Digital’ covers a range of applications. Graham Currie of the Public Transport Research Group at Monash University underlined that in the context of passenger rail, ‘digital’ means different things across countries. The point of commonality is the outcome of improving operations and the passenger experience. But not all innovations are good — some do not work and others take a long time to develop.

Michael Lichtenegger of Upstream – Next Level Mobility summed up the task facing urban rail: to solve individual and sustainable mobility needs, rather than solely selling tickets. He emphasised that the changes taking place in transport resulted from many factors: population growth, urbanisation, decarbonisation, the development of a sharing industry, connectivity, increasing automation and digitalisation.

The last of these was a prominent theme throughout the conference. ‘Digitalisation is clearly a buzzword, but we understand that there is more behind it’, said UITP Secretary General Mohamed Mezghani. ‘It is already bringing huge changes to the sector and this is only the beginning.’

German national railway Deutsche Bahn offered examples of these changes. Chief Digital Officer Stefan Stroh called digitalisation one of DB’s key strategic pillars, adding that digital technologies would change the way DB interacts with passengers. DB is developing the Quixxit app and Ioki mobility-as-a-service platform, and is undertaking no fewer than 93 blockchain experiments.

Stroh predicted that mobility would be transformed much in the same way as news media, music and retail have been. As in other industries, ‘people have to work differently in the future than they do today’, and DB would have to become more agile. Stroh contrasted the traditional attitude of ‘plan, build, run’ with the more urgent ‘get shit done’.

Marc Badoux of Transports Lausannois echoed the point that rail and metro operators are far from being agile organisations, but added that there were good reasons for this. Nevertheless, the public transport industry, which is slow to innovate, needs to find a way to keep its culture and maintain safety in a more creative way, or other modes will outflank it.

Mezghani picked up on the cultural shift that digital technologies bring, saying that it would be a mistake to focus only on the tools for digitalisation. Public transport needed to change its whole culture to appeal to so-called digital natives. At the same time, digitalisation is changing the profile of people that the industry needs, he warned. Public transport is now competing with many other sectors, like banking, to hire data analysts and cybersecurity experts.

Automated metros exemplify a well-established application of digital technology, and in this area too there was discussion of what the future might bring. Ahmed Miske El Hadrami of signalling supplier Thales drew a distinction between automation and autonomy. The former is simply following a predefined algorithm; the latter involves environmental awareness and the ability to make decisions. Automated metro trains are quite common, autonomous trains do not yet exist.

Operators of automated metros added their own views. Philippe Leguay of Keolis expressed his belief that artificial intelligence should not replace all human intervention in train operation. RATP Dev’s Olivier Badard underscored that converting a metro line to driverless operation, as has happened in Paris, need not mean that drivers lose their jobs. They receive training and move up in the value chain — in Paris many now work in the operations control centre. TL’s Badoux summed it up nicely when he talked of ‘using the hands that automation frees to enhance the passenger experience’.

Improving the Passenger Experience

Several speakers stressed the potential of digital technologies to improve the customer experience. Patrique Campal-Lindahl of Transdev defined this as the sum total of how a passenger interacts with a brand, not just during the journey.

Yukiko Kimishima of JR East noted that passengers expect a higher level of service in the digital age. Singapore metro operator SMRT set up a Commuter Engagement Office in February with the mandate of ‘making commuting more joyful and inclusive’, explained Chief Commuter Engagement Officer Elaine Koh. The office aims to combine traditional customer experience management with ‘digital thinking’.

Annie Leung of MTR identified three challenges: evolving customer demands (caused by factors such as population ageing); digitalisation, which brings a higher expectation of mobile services; and industry transformation. To address these, she said, MTR not only offers an app and chatbot, but works with journey planning app CityMapper during times of disruption. The MTR app sends out links to CityMapper so that passengers can replan their journey.

The Importance of Partnerships

The co-operation between MTR and CityMapper illustrates another recurrent theme: the importance of partnerships. DB’s Stroh threw this into focus when he said that DB ‘cannot survive in the digital environment alone’.

Lichtenegger outlined why this was the case. Public transport is well suited to large, densely populated areas, but less so to areas and times of lower demand, where the car is still the preferred mode. His vision of the future includes cars, albeit far fewer than are on the roads today. Instead, he sees shared zero-emission cars, used selectively, but for this to happen the mobility sphere needs new players.

RATP Dev’s Badard was enthusiastic about the prospect. ‘We embrace the opportunity to see new mobility players come into the public transport ecosystem’, he said, adding that there is a need to harness the innovation that these players bring, particularly in first and last mile connections. ‘Working with them can only make public transport better, more agile, more customer-centric’, he asserted. ‘It is good for the industry and a must for operators.’

This view was echoed by KK Saberwal of Delhi Metro Rail Corp, who did not see new mobility companies as competitors but as complements to the metro. Each mode has its strengths: the metro offers the fastest journeys, but other modes like e-rickshaws can fill the first and last mile gap.

Arnd Bätzner of Mobility CarSharing Cooperative spent much time arguing why mass transit modes cannot be replaced by private cars, autonomous or otherwise. The bottom line is not emissions but capacity, he believed; too many cars would be required to match the capacity of a tram or rail line. Any transport mode must be aligned with the needs of the city.

While many speakers were in agreement on the role of partnerships, a tension was recognised when it comes to data, which drives many digital innovations. Lichtenegger argued that data generated by passengers should be used by public organisations and not private companies. Not only were people more likely to share their data with public organisations, but such data ought to be used for public services.

‘If data is like gold dust, we need to stop it from becoming fool’s gold’, quipped Kuldeep Gharatya of Transport for London. He warned against using technology for technology’s sake, making the case for embedding it into an operational and maintenance paradigm. ‘Any monkey can spot patterns in data’, he said, adding that contextual knowledge of the system and of operations makes these insights useful.

Away from the SITCE sessions, World Cities Summit speakers also had data on their minds. ‘In the past, the goal was to get data’, said Gerald Sun of Mastercard, ‘now the goal is to squeeze out insights from that data’.

Bringing Digitalisation to Life

It is often difficult to see digital innovations in practice as a passenger. But conference delegates who took part in the technical visit to the Tuas West metro depot were treated to a cornucopia of innovation. No fewer than 10 exhibits showcased the technologies being tested in this environment.

The most eye-catching were the robots. Japanese company Doog International demonstrated a ‘follow-me’ robot nicknamed Thouzer. This can be programmed to follow a person or another robot, and also has an automatic line-tracing mode. The technology is already in use elsewhere: 32 such robots work in Singapore, mostly in warehouses, in addition to 13 at Changi Airport and two in Tampines Regional Library.

Local firm ST Engineering displayed an autonomous robotic mover. Used in hospitals and on factory assembly lines, this battery-powered robot is equipped with LIDAR sensors and controlled via a wi-fi router. JCS and SIMTech, meanwhile, have developed an autonomous robot to clean train interiors, also equipped with LIDAR.

China’s Baichuan has been testing a proof-of-concept track-mounted automatic vehicle inspection system. This uses lasers and cameras to monitor shoegear, axles and gearboxes as a train passes over it. ST Engineering is developing a cold spray technique for rail repair, particularly for insulated rail joints. The method is already well-established in aerospace, and ST has been using it to repair military vehicles.

Singapore Polytechnic showed a self-learning mobile application that allows workers to use interactive training manuals. In a similar vein, ST Engineering has developed a ‘mixed reality’ interface for training. This is similar to its augmented reality application for train inspection, which was also on show. Delegates saw two pieces of ST’s software for depot management: an integrated maintenance and diagnostics centre, and a depot facility management display.

Seeing physical manifestations of digital technology brought a satisfying end to an intriguing glimpse into the future of public transport and mobility.

Surveying a new Mobility Landscape, Transport Research Arena 2018 at Vienna, Austria

27 Apr. 2018

Delegates had a Chance to visit the Exhibition that took place alongside the C onference. (Photo: European Union, 2018)

Data, automation and new models of transport were just some of the talking points at Transport Research Arena 2018 at Vienna, Austria.

‘Do not think about cars. Do not think about trains, or roads or ports. Think about people.’ The end of EU Transport Commissioner Violeta Bulc’s speech at Transport Research Arena hinted at a thread running through the four-day event, namely the increasing interconnectedness of various transport modes and the need to move away from thinking in silos.

The conference welcomed a total of 3 540 delegates in Wien on April 16-19. The event included an exhibition and an ‘Industrial Round Table’ which brought together representatives from several transport sectors’ supply industries.

Subtitled ‘A Digital Era for Transport — solutions for society, economy and environment’, the conference was structured around 12 themes, covering all transport modes from walking to aeronautics. The organisers pulled out digitalisation and decarbonisation as two key topics, but several more emerged as the presentations were given.

Henrik Hololei of DG Move identified the trends driving transport innovation as digitisation, automation and ageing populations. Austrian Transport Minister Norbert Hofer used his opening address to highlight his belief that telecoms technology is the key to transport innovation. Philippe Crist of the OECD’s International Transport Forum made the case for thinking not about technology in itself, but to start with the uses to which it will be put. Many technologies in use today were originally developed to solve problems that we do not even think about any more.

Pollution problem

Bulc opened her speech with some statistics: the transport sector creates 5% of jobs and 5% of GDP in the EU. But she contrasted these with a less upbeat number: transport is responsible for 24% of pollution, making it the second-largest polluter in Europe. Bulc said that TRA needed to address problems such as these, and pointed to new technologies being developed in aviation as examples of what can be achieved in other transport sectors.

On the topic of innovation, Bulc suggested that this is what happens at the edges — for example, when different technologies or business models join together. This is one reason why the transport industry needs to be more balanced, including in terms of gender. She also had a message for young people: ‘keep dreaming, because you need to create the world you want to live in’. She sees young people as able to bring ‘excitement, innocence and boldness’ to what can be a complacent industry.

In his keynote, The Futures Agency CEO Gerd Leonhard revealed some interesting insights into the future of transport. ‘Business as usual is dead’ was one of the most resonant messages, underlined by the importance of collaboration over competition as a driver of success.

Leonhard sees two big shifts in mobility: from internal combustion to electric vehicles, and from human-driven to autonomous. A less pronounced trend is that which is taking people away from private vehicles and towards mobility as a service. He describes MaaS as an ‘ecosystem’ rather than an industry in the traditional sense, which is the way that several sectors — not just transport — are moving.

Cars are public transport

MaaS, along with related topics such as car-sharing, recurred in several sessions during the conference. Remy Le Boennec of the VEDECOM research institute even went so far as to say that cars are the public transport of tomorrow. He noted that public transport’s traditional competition with private cars is coming to an end as the modal share of public transport is no longer growing in large European cities.

A concrete example of what car-sharing can achieve was given by Michael Glotz-Richter from Bremen’s Environment, Construction & Transport office. Each shared car in Bremen takes 16 private cars off the road, and so far the city has removed 5 000 private cars by offering shared vehicles. The increase in car-sharing is transforming car companies from vehicle producers to mobility providers.

Maria Kamargianni from University College London presented the results of a ‘Mobility as a Service Maturity Index’. Interestingly, this found that London is more ready for MaaS than the West Midlands, but the latter region has recently introduced MaaS, through the Whim platform, while London does not yet have anything of the sort. London’s approach to the changing mobility landscape was also picked up by her fellow UCL researcher Tom Cohen. Making the point that city authorities’ need for caution leads to a markedly different approach from that of companies like Uber, he suggested that traditional ways of drawing up regulations are not necessarily appropriate when faced with fast-moving entrepreneurs. One solution might be experimental regulation, where rules are made more quickly but can be adapted or simply revoked just as quickly.

Access for all

French national railway SNCF was another contributor to the discussion on new mobility. Chief Innovation Officer Carole Desnost sees a need to understand how passengers might use non-traditional transport services, and to prepare for their arrival: ‘we sometimes need to have a disruptive way of thinking and reinvent ourselves’.

Desnost’s colleague Nicolas Renoir, meanwhile, told delegates how SNCF is using data from OpenStreetMap to develop apps to help people with reduced mobility to navigate stations. The aim is ‘seamless mobility for every passenger’. The importance of station accessibility is greater than many realise: half of French rail users have reduced mobility, if taking into account passengers with pushchairs and heavy luggage.

The closing session featured a handover ceremony to TRA 2020 host city Helsinki. Finnish Transport Minister Anne Berner listed the four trends that she thinks will have the greatest impact on the future of transport. These are digitalisation, the speed of technological development, the effects of urbanisation and how we deal with climate change. With the second of these trends in mind, the next edition of the conference is likely to be just as thought-provoking.

Mobile Technology Ecosystems to transform Travel in 2018; San Diego, California, USA

23 Jan. 2018 | by **Robert Sprogis**

This year will see the more widespread adoption of mobile-first infrastructure by transport operators, predicts Robert Sprogis, Director of Mobile at Cubic Transportation Systems, who says effective implementation will require an integrated strategy leveraging the total mobile ecosystem.

Technology is evolving at such a rapid pace that we don’t know what is going to happen in three months, six months or even a year. But I believe 2018 will be a catalyst year in the transport sector, with more cities adopting mobile technology and setting an example for other markets to follow.

Transport operators which adopt mobile-first infrastructure will be well placed to capitalise on emerging technologies to stay at the forefront of innovation, but a mobile-driven strategy that meets the needs of commuters will require deeper and increased commitment.

Physical ticket gates at stations might need to be repaired as when they malfunction, but apps require continual updates and maintenance to ensure constant performance.

More than entrance and exit

In 2018 we will continue to see the digitisation of passenger credentials for entering and exiting a station, and over time mobile will become much more than merely a mechanism for entry and exit.

As we are already seeing with other consumer-facing applications, we can expect to see transport apps leverage the power of artificial intelligence and machine learning to become smarter and more personalised, understanding a traveller's usual routes, anticipating issues that may affect a journey, and proactively serving up solutions based on individual preferences and behaviours.

AI-driven chatbots within a mobile app could help guide travellers and answer routine questions and common queries, reducing strain on the operator's staff and speeding up the resolution of any problems.

Beyond the app

Mobile is about far more than app usage, it is a technology enabler in and of itself. From Bluetooth to NFC to soundwaves, mobile strategies don't have to centre solely around app downloads and uptake.

A barcode sent via SMS could easily take the place of a paper ticket. This sort of broad thinking will enable transport operators to address the needs of various demographics and cater to individual preferences.

Looking to the year ahead, I believe the operators that implement mobile effectively will be the ones that build an integrated strategy leveraging the total mobile ecosystem.

Keeping up with Ticketing Technology; International

03 March 2017 | by **Alon Levy**

As transport ticketing technology moves ahead at a rapid pace, what are the similarities and differences in cities around the world?

The past few years have seen an explosion in public transport fare payment technology. Most visibly, smartphones are offering options that did not exist before. The earliest smartcards, such as Hong Kong's Octopus and Seoul's Upass, date from the 1990s, and this technology has recently become more widespread, with features that were not available 15 years ago. Services are increasingly integrated through online payment and via links between smartcards and credit cards.

It took several years for the previous generation of advances in smartcard technology to catch on. If the early adopters had not included former British colony Hong Kong, it is likely that London would have taken longer to develop its Oyster card.

Today technology is advancing in many cities, but this tends to take place in isolation with cities apparently reluctant to adopt common systems. The features detailed below are all useful, and in most cases can work together, but an innovator in one aspect can be a laggard in adopting another. Each feature alone helps to make the process of fare payment more seamless, but taken together the different features can simplify and enhance the experience of paying for public transport.

In London the Oyster card does not require passengers to decide in advance whether to buy a day pass or pay for each trip separately, as the software automatically calculates the fare based on what is favourable to the passenger. This works on the basis of a daily cap applied retroactively rather than a daily pass purchased in advance. There is also a weekly cap, but no monthly cap. In contrast, Paris plans to implement a monthly cap in two to three years. In Paris there is currently no cap — in fact, its Navigo smartcard can only load passes, not stored value for pay-as-you-go trave

Multiple wWys to pay

A more involved question is how to integrate smartcards with other forms of payment. The Hong Kong Octopus card and Japanese smartcards such as JR East's Suica are licensed for use as electronic money. They can be used to pay at vending machines, shops, lockers and taxis. This began in the late 1990s and early 2000s, when credit card penetration in Hong Kong and Japan was far from 100%. The transaction fees are lower than for credit cards: 1% for Octopus, compared with about 2% for US credit cards. As the market share of public transport in Tokyo and Hong Kong is very large, nearly the entire population owns a smartcard.

Some cities prefer to do things the other way round: use credit and debit cards as contactless travel smartcards, with the usual fees. London, Chicago and Salt Lake City offer this option, and Paris is planning to introduce it after 2020. However, transitioning to full credit card or smartphone use in lieu of a smartcard is difficult, as not all passengers own either. This is true in the USA in particular. In 2015 only about half of public transport users in Los Angeles owned a smartphone, and a sizable minority owned no phone at all. New York found this out the hard way in its long-term plans to implement a fare collection system based on credit cards, and Chicago and Salt Lake City both have traditional smartcards in addition to credit card payment options.

Open payment using credit cards has the advantage of easier integration, as there is no need for a new card in every city. In Japan public transport services are run by regional private companies, and each company or local consortium has its own card; integration is achieved with bilateral agreements. However, even with a smartcard, nationwide integration is possible, as shown by the Netherlands with its OV-chipkaar

Horses for Courses

Implementation of these technologies depends on other choices that each city or region makes about its transport fares. SMS payment is easier to implement on metros with flat fares or only a few zones, such as in Helsinki, Praha or Stockholm. Passengers can send by SMS a simple code for flat fares; distance-based fares might require passengers to send a more complex SMS, making mistakes more likely.

Anonymous smartcards typically have strict limits on how much money they can store. Suica is limited to ¥20 000, for example. This makes it harder to implement a monthly cap in areas where monthly passes are expensive, such as London.

Most cities can still implement all or nearly all of the above features, subject to some questions. The big decision is whether to use credit cards as a form of open payment, or to use an internal card but then license it as anonymous electronic money for small purchase

Related News

- 20 Feb 2018 - Helsinki opens its ticket retail interface to everyone
- 31 Jan 2018 - Nationwide transport smart card to be launched
- 17 Nov 2017 - Cubic touches in to extended London ticketing contract
- 26 Oct 2017 - New York to get London-style fare collection system
- 07 Sep 2017 - TfL launches mobile ticketing app
- 21 Aug 2017 - Beijing metro launches mobile ticketing
- 01 Mar 2017 - Singapore contactless ticketing pilot to begin in March
- 01 Mar 2017 - London's contactless payment goes global
- 18 Jul 2016 - OV-chipkaart to be converted from smart card to ID-based system

- [18 May 2016 - Android Pay for pay-as-you-go travel in London]
- [20 Apr 2016 - Sydney to use London-style open payment technology]

NS to test contactless Card Payment; Netherlands

09 Jan. 2019

NETHERLANDS: National passenger operator NS is to test the use of contactless bank card payment as an alternative to the OV-chipkaart national multimodal transport smart card.

NS said using a bank or credit card for travel was a ‘logical and easy’ choice for many people, as they would not need to purchase and top-up a separate smart card or buy a ticket in advance.

Regular users of seven stations on the route between Leiden and Den Haag can express interest in the participating in the trial, which is scheduled to get underway in late January and run for six months.

Participants would be able to check-in and check-out at selected OV-chipkaart card readers using a contactless bank card issued by ABN AMRO, ING, Rabobank, SNS, ASN Bank or RegioBank or a contactless Mastercard or Visa credit card issued by International Card Services. The back-office would process their travel records overnight and bill them through the card issuer.

NS said any future national roll-out of contactless payment would require significant adjustments by all operators as well as OV-chipkaart operator Trans Link Systems, and because of the different operating concessions in place this would need to be done in stages.

Related news

- 05 Dec 2018 - Oyster and contactless payment to be extended further outside London
- 03 Apr 2018 - Rhätische Bahn replaces ticket machines
- 16 Aug 2017 - Elron rolls out Ridango ticket sales system
- 21 Sep 2016 - JR East offers Suica on Apple Pay
- 22 Jul 2014 - Dutch smart ticket roll-out completed
- 16 Jan 2009 - OV-Chipkaart roll-out creeps forward

METRO NEWSLETTERS
on
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PUBLIC MULTIMODAL URBAN, SUBURBAN AND INTERURBAN PASSENGER TRANSIT SYSTEMS WITH METRO-BUS, LIGHT-RAIL, METRO-RAIL, REGIONAL RAPID TRANSIT, COMMUTER-RAIL, ROPE-WAY/TRAIN, WATER-METRO, AUTOMATED PEOPLE-MOVER

TRANSPORTATION AND ECONOMIC DEVELOPMENTS IN MODERN URBAN/MEGAPOLIS ENVIROMENT

METRO Newsletter by Dr. F.A. Wingler
METRO 25, January 2019

Oyster Ticketing, London, UK

PART I: ACTIVITIES FOR URBAN MOBILITY SOLUTIONS IN INDIA

Masabi and Chalo target Indian Transport Ticketing Market; India

19 Apr. 2018


Kochi Metro

Delhi Metro

INDIA: A partnership to offer mobile fare collection and journey planning technology in the Indian market was announced by Masabi and Chalo on April 18.

Indian journey planning and ticketing company Chalo (previously called Zophop) is to integrate UK-based mobile ticketing and software-as-a-service supplier Masabi's Justride Mobile Ticketing SDK into its app, allowing passengers to purchase and display tickets. Chalo will also license Masabi's validation software.

Transport operators using the system would gain access to passenger and real-time vehicle information, helping them optimise services across their networks.

Masabi said Indians spend US$73bn/year on bus, metro, train and taxi fares, with 91% of this spent on local transport.

'Developed markets have moved to smart cards, but 95% of India's public transport tickets are still bought with cash', said Chalo CEO Mohit Dubey. 'With this partnership we can leapfrog to mobile ticketing, bringing us ahead of many developed markets, and saving the entire investment required for smart cards.'

Chalo currently operates across 13 500 buses in eight cities, supporting 130 million transactions per month.

'In a country with one billion mobile phones, mobile ticketing is an obvious and compelling offering, and will make transportation one of the leading categories in our Digital India and cashless payments initiatives', said Dubey.

- 27 Jun 2018 - Metro standards committee formed
- 12 Apr 2018 - Uber app to offer public transport tickets
- 06 Jul 2017 - Den Haag introduces tram and bus mobile ticketing
- 19 Jan 2017 - Masabi launches mid-market m-ticketing app
- 06 Jul 2016 - Mobile ticketing comes to New York commuter rail
- 10 Dec 2015 - Keolis takes share in Masabi
- 06 May 2014 - New York commuter railways introduce mobile ticketing
- 09 Sep 2013 - Smartphone ticketing targets special events

PART II: ACTIVITIES FOR URBAN MOBILITY SOLUTIONS INTERNATIONAL

Keeping up with Ticketing Technology; International

03 Mar. 2017 | by **Alon Levy**

As transport ticketing technology moves ahead at a rapid pace, what are the similarities and differences in cities around the world?

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A more involved question is how to integrate smartcards with other forms of payment. The Hong Kong Octopus card and Japanese smartcards such as JR East's Suica are licensed for use as electronic money. They can be used to pay at vending machines, shops, lockers and taxis. This began in the late 1990s and early 2000s, when credit card penetration in Hong Kong and Japan was far from 100%. The transaction fees are lower than for credit cards: 1% for Octopus, compared with about 2% for US credit cards. As the market share of public transport in Tokyo and Hong Kong is very large, nearly the entire population owns a smartcard.

Some cities prefer to do things the other way round: use credit and debit cards as contactless travel smartcards, with the usual fees. London, Chicago and Salt Lake City offer this option, and Paris is planning to introduce it after 2020. However, transitioning to full credit card or smartphone use in lieu of a smartcard is difficult, as not all passengers own either. This is true in the USA in particular. In 2015 only about half of public transport users in Los Angeles owned a smartphone, and a sizable minority owned no phone at all. New York found this out the hard way in its long-term plans to implement a fare collection system based on credit cards, and Chicago and Salt Lake City both have traditional smartcards in addition to credit card payment options.

Open payment using credit cards has the advantage of easier integration, as there is no need for a new card in every city. In Japan public transport services are run by regional private companies, and each company or local consortium has its own card; integration is achieved with bilateral agreements. However, even with a smartcard, nationwide integration is possible, as shown by the Netherlands with its OV-chipkaar

Horses for Courses

Implementation of these technologies depends on other choices that each city or region makes about its transport fares. SMS payment is easier to implement on metros with flat fares or only a few zones, such as in Helsinki, Praha or Stockholm. Passengers can send by SMS a simple code for flat fares; distance-based fares might require passengers to send a more complex SMS, making mistakes more likely.

Anonymous smartcards typically have strict limits on how much money they can store. Suica is limited to ¥20 000, for example. This makes it harder to implement a monthly cap in areas where monthly passes are expensive, such as London.

Most cities can still implement all or nearly all of the above features, subject to some questions. The big decision is whether to use credit cards as a form of open payment, or to use an internal card but then license it as anonymous electronic money for small purchase

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- 07 Sep 2017 - TfL launches mobile ticketing app
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- 01 Mar 2017 - Singapore contactless ticketing pilot to begin in March
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- 18 May 2016 - Android Pay for pay-as-you-go travel in London
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Helsinki opens its Ticket Retail Interface to everyone; Finland

20 Feb. 2018

FINLAND: Helsinki regional transport authority HSL is creating an open retail platform for single tickets intended to allow anyone in Finland or abroad to purchase single tickets for retail sale.

The interface will be available at sales-api.hsl.fi. ‘We are building a highly innovative and advanced digital retail API’, explained Mari Flink, director of Customer Experience & Sales. ‘We are confident that we will have many types of businesses and innovative pilot projects generating creative value-added services using the interface. We also aim to actively contact transport operators both in Finland and abroad.’

HSL’s Reittiopas journey planner has been using open interfaces for 15 years, but the introduction of an open sales API makes information security and business risk more critical. ‘Opening interfaces for accessing data is considerably easier than opening a public sales interface, which moves plenty of money and high transaction volumes’, said Hannu Heikkinen, director of HSL’s Technology Solutions Department. ‘We want to ensure that the interface poses no information security or credit risks. Some 370 million journeys are made annually on HSL’s transport services, and there are dozens of millions of sales transactions. We are talking about a huge volume’.

HSL has also invited operators in Finland and abroad to participate in a two-year Idea Lab programme which would develop multi-modal integration and mobility as a service pilot projects. ‘Ideas can apply to physical mobility services, ticketing and marketing collaboration, combination and relaying services for travel chains, or experimenting with automated transport', said Flink.

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- 26 Jun 2018 - Italian state railway launches multimodal app
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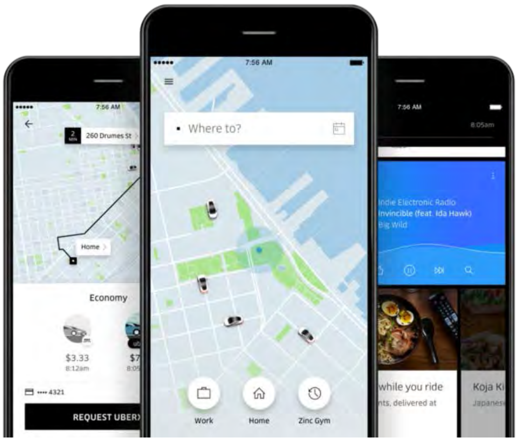
Uber Upp to offer public Transport Tickets; USA, International

12 Apr. 2018



INTERNATIONAL: Mobile ticketing developer Masabi announced on April 11 that it has entered into a strategic partnership with on-demand taxi company Uber which would integrate public transport tickets into the Uber app.

Once an agreement is reached with a public transport agency, users would be able to buy mobile tickets in Uber's app. Masabi will supply its Justride software development kit, which allows third-party applications to request fares, make payments and deliver visual and barcode mobile tickets to a smart phone.

'Having a greater variety of transportation modes at your fingertips helps make it increasingly easy to live without a car', said Uber's Head of Product, Mobility, Jahan Khanna.

'Our mission has always been to make it quicker and easier to get around cities using a range of transit options and in Uber, we've found a perfect partner to help us further that mission', said Masabi CEO Brian Zanghi.

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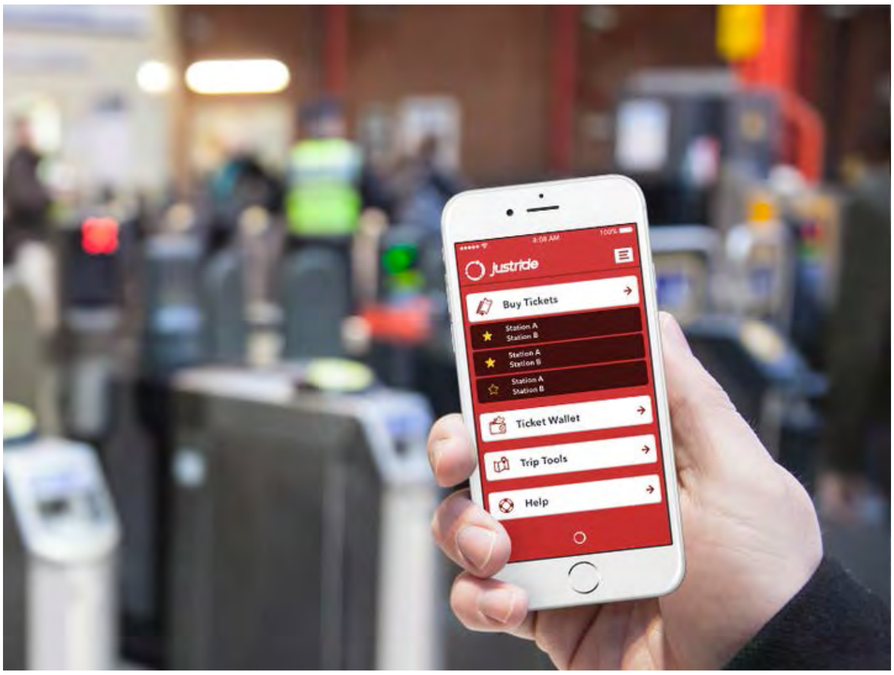
Masabi launches mid-Market m-Ticketing App; UK, USA

19 Jan. 2017



TICKETING: Mobile ticketing supplier Masabi has launched a product aimed at small and medium-sized transport agencies and private operators.

JustRide Express would be available on a one-year contract for a fixed monthly fee with no upfront costs. Masabi says that the custom-branded mobile ticketing app can be deployed in less than 90 days, and works with the JustRide Express Hub cloud-based back office, which provides real time data, reporting and analytics.

'Mobile Ticketing is becoming a must-have for transport providers of all sizes — from tier 1 cities to small private operators', said Masabi CEO Brian Zanghi. 'However, the traditional solutions currently in the market are too costly and slow to deploy to serve a huge segment of the market.'

JustRide Express is initially available in the USA, UK, Australia, Canada and Ireland, and will be rolled out to other markets in the coming months.

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- 10 Dec 2015 - Keolis takes share in Masabi

Den Haag introduces Tram and Bus mobile Ticketing; Netherlands

06 Jul. 2017

NETHERLANDS: Den Haag transport operator HTM has rolled out mobile ticketing on its bus and tram routes.

Masabi has supplied its JustRide smartphone app and cloud-based back office. The app has Dutch, German and English interfaces, and links to HTM's journey planning app. Transactions are processed using the iDEAL online payments system.

Related news

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- 05 May 2017 - Mobile ticketing technology framework published
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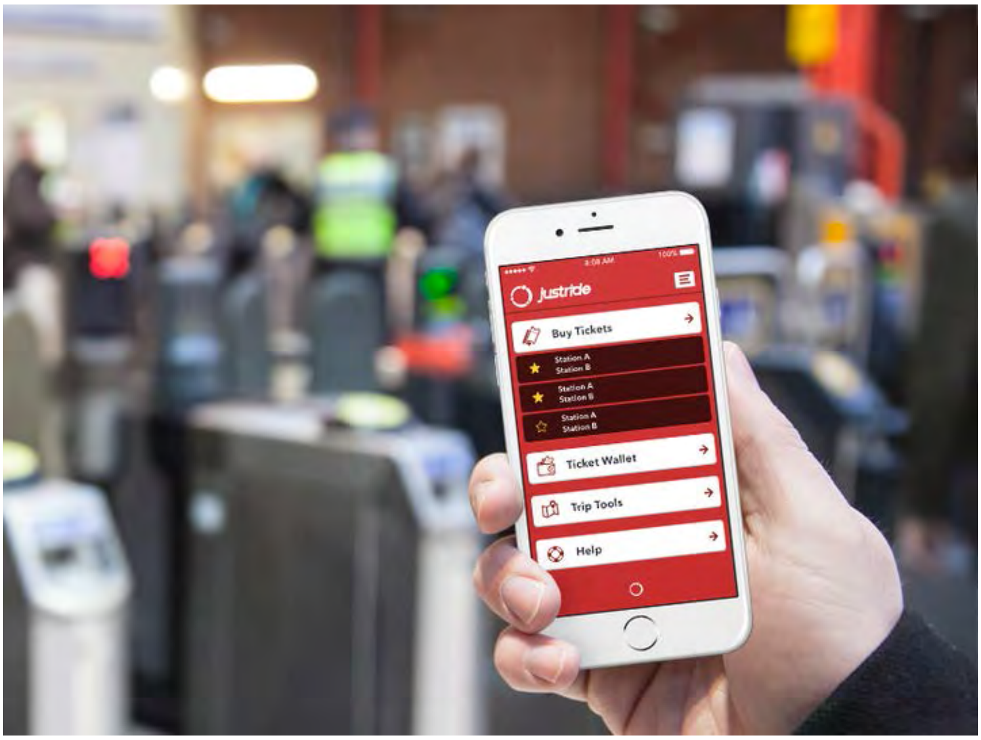
Keolis takes Share in Masabi; France, UK, USA,

10 Dec. 2015



MASABI: International transport operator Keolis has taken a share in mobile ticketing provider Masabi as part of an investment made with MasterCard, Lepe Partners and existing shareholder MMC Ventures. The combined investment from the four companies amounts to US$12m.

Earlier this year Masabi formed partnerships with both Keolis and MasterCard. Keolis is to incorporate Masabi's 2D barcodes into its PlanBookTicket for the French market, with further co-operation envisaged in other markets in the future. Under a separate agreement, Masabi's JustRide mobile ticketing platform would use MasterCard payment technology.

'One of our key priorities is to improve our passengers' travel experience, using mobile technology to make journeys seamless', said Keolis Group Executive Chairman Jean-Pierre Farandou. 'The combination of our expertise will give us a step ahead both in France and around the world', he added.

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Mobile Ticketing is coming to Madrid; Spain

13 Nov. 2018

SPAIN: Bus operator EMT Madrid plans to launch a 12-month mobile ticketing pilot on its Airport Express bus route from the first quarter of 2019.

The ticketing app will be based on Masabi's Justride software platform and will use Mastercard payment technology. Santander will act as the acquiring bank for the deployment.

- Masabi is adding account-based contactless bank card ticketing to its Justride platform. This will initially be introduced on Bilbobus services in Bilbao, where Masabi will work with its Spanish partner Gertek.

Related news

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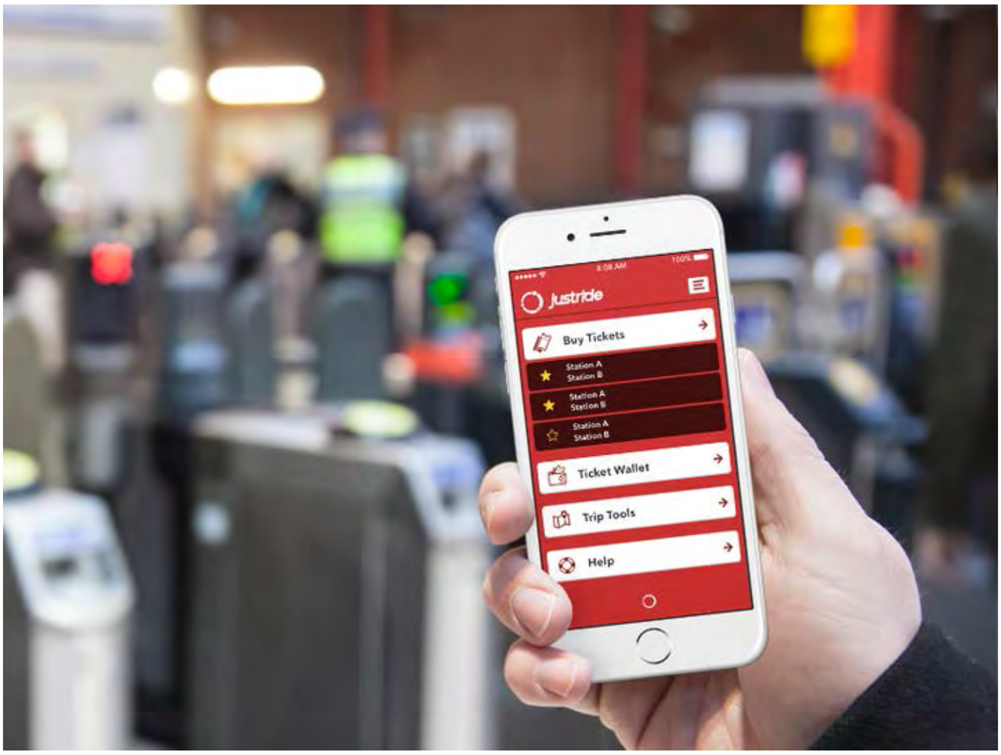

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- 10 Dec 2015 - Keolis takes share in Masabi

Keolis and Famoco form mobile Ticketing Partnership; France

11 Oct. 2017

FRANCE: Keolis announced on October 10 that it had entered into a partnership with Famoco to design a next-generation ticket validator. This forms part of a longer-term aim to accelerate the digitisation of transport ticketing.

A trial of the validator is taking place in Orléans, and a general rollout is planned for the first half of 2018. The validator would be able to read any smartphone ticket using barcodes or NFC, as well as validate existing smart cards. According to Keolis, the new validator would be cheaper and easier to operate than existing models.

‘Our partnership with Famoco is an important milestone in our PlanBookTicket digital strategy, supported by our subsidiary Kisio Digital’, said Keolis’ Executive Director of Marketing, Innovation & Services Laurent Kocher. ‘The aim is to give each traveller the best route information, with multimodal route options, and the possibility of purchasing and validating tickets in a totally dematerialised way on their mobile.’

Keolis said that nearly 23 billion transport tickets would be purchased via mobile handsets annually by 2020.

Related news

- 17 Apr 2018 - Keolis restructures to meet ‘strategic challenges’
- 10 Dec 2015 - Keolis takes share in Masabi
- 04 Dec 2015 - Mobile ticketing joint venture formed

Mobile Ticketing Joint Venture formed; France

04 Dec. 2015

FRANCE: The creation of the Wizway Solutions joint venture dedicated to developing mobile ticketing technology was announced on December 3. Four founder members each have a 25% share: Paris transport authority RATP, national railway SNCF, digital security company Gemalto and telecoms provider Orange. The venture is supported by the Ministry for the Economy, Industry & Digital Affairs and the Ministry for Transport, and is still subject to regulatory approval.

Described as the world's first consortium dedicated to contactless mobility, Wizway Solutions will 'offer transport organising authorities and transport companies a modern and simple ticketing solution that will facilitate door-to-door travel'.

The aim is to develop technology for NFC-enabled mobile devices that allows ticket purchasing through apps and secure storage of tickets on SIM cards. Passengers would only require a mobile device, which can be used even if switched off or out of battery.

As well as meeting the Calypso contactless electronic ticketing standard, the technology is to be compatible with the various mobile operating systems in use in France, with a view to expansion to international markets 'in the medium term'. Other transport operators and telecoms carriers are welcome to participate.

Wizway products are to be made available to transport companies in 2016, with a roll-out to passengers envisaged the following year.

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- 11 Oct 2017 - Keolis and Famoco form mobile ticketing partnership
- 13 Jul 2016 - Cubic licences London's contactless ticketing technology

- [10 Jun 2016 - Lille rolls out Euro 2016 contactless wristband tickets]
- [18 May 2016 - Android Pay for pay-as-you-go travel in London]
- [17 Feb 2016 - APTA signs NFC MoU]
- [14 Jan 2016 - Contactless card rail ticketing development funded]
- [01 Oct 2015 - Scheidt & Bachmann and Octopus announce ticketing partnership]
- [28 Feb 2015 - Hands-free mobile ticketing demonstration]
- [03 Dec 2014 - Bordeaux selects Thales ticketing]
- [16 Sep 2014 - Contactless payment arrives in London]
- [06 May 2014 - New York commuter railways introduce mobile ticketing]
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- [09 Sep 2013 - Smartphone ticketing targets special events]

Mobile Ticketing comes to New York Commuter Rail; USA

06 Jul. 2016

USA: New York MTA has introduced m-ticketing on its Long Island Rail Road and Metro North commuter rail networks using technology provided by mobile fare collection specialist Masabi.

Using Masabi's JustRide mobile ticketing platform, passengers are able to purchase tickets using their smart phones as an alternative to a vending machine. As part of a phased roll-out, m-tickets have been accepted since June 30 on Metro North's Hudson line and the Port Washington route operated by LIRR, and acceptance is to be extended to cover both networks by the end of August.

Passengers can purchase and display tickets on their phone or tablet through MTA's eTix mobile application, developed by Masabi. Masabi is also supplying its JustRide Inspect validation application which allows tickets to be scanned using standard smartphones. This tool is already in use with 11 transport operators around the world.

‘The introduction of mobile ticketing at New York MTA will be the largest deployment of its kind and we are delighted to have been selected to partner with MTA’, said Brian Zanghi, CEO of Masabi. ‘This is a landmark project that will change the way riders travel in the New York region, with passengers able to buy tickets anywhere, at any time, with a few taps.’

Masabi was selected for the m-ticketing contract in April 2014 following a tender issued in March 2013. The commuter rail roll-out is the first stage in a long-term programme to introduce smart ticketing across all of MTA’s urban and regional transport operations.

Next year, it intends to extend the functionality of the MTA eTix app to allow LIRR and Metro-North customers who transfer to or from the New York City Subway or bus services to pay their fares using a single portal and account. MTA has also issued a request for proposals to create a bespoke fare payment system for the NYCT bus and metro networks, plus the Staten Island Railway. This would be interoperable with the eTix app, and would offer a variety of fare payment methods, including smartphones, contactless bank cards and pre-paid cards.

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- 19 Apr 2018 - Masabi and Chalo target Indian transport ticketing market
- 26 Oct 2017 - New York to get London-style fare collection system
- 05 Jul 2017 - Atlanta mobile ticketing contract awarded
- 02 Feb 2017 - Replacing paper tickets with mobile is 'only the start'
- 19 Jan 2017 - Masabi launches mid-market m-ticketing app
- 01 Jan 2017 - New York MTA opens first section of Second Avenue Subway
- 19 Jul 2016 - New York MTA to procure 1025 Subway cars
- 18 Jul 2016 - OV-chipkaart to be converted from smart card to ID-based system
- 13 Jul 2016 - Cubic licences London’s contactless ticketing technology
- 06 May 2014 - New York commuter railways introduce mobile ticketing
- 09 Sep 2013 - Smartphone ticketing targets special events

New York to get London-Style Fare Collection System; USA

26 Oct. 2017

USA: New York Metropolitan Transportation Authority has selected Cubic Transportation Systems to supply an account-based fare collection system to replace the current MetroCard.

The $539·5m contract, which is subject to finalisation, includes the supply of fare validators and ticket vending machines for 472 Subway stations and 6 000 buses to enable payment by a dedicated card, contactless bank card or mobile device. Passengers would be able to use accounts to view their journey history, check balances and add value to smart cards.

Cubic is working with Mastercard and Transport for London, which operates the world's largest open payment and contactless-based fare collection system.

The contract includes options worth $33·9m to supply equipment for the Long Island Rail Road and Metro-North Rail Road commuter networks.

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- 27 Nov 2018 - CBTC goes live on New York's 7-Flushing Subway line
- 24 Sep 2018 - Walk-through trains are coming to the New York Subway
- 12 Sep 2018 - San Francisco fare collection to be modernised
- 09 Jul 2018 - Contactless ticketing rolled out across Milano metro
- 22 Jun 2018 - Subway station damaged in 9/11 attacks to reopen in October
- 23 May 2018 - Fast Forward plan seeks to renew the New York Subway
- 23 May 2018 - Contactless ticketing tests begin on Milano metro
- 28 Mar 2018 - Contactless payment comes to Dijon
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- 21 Nov 2017 - MBTA's CharlieCard to be replaced under PPP contract
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- 01 Nov 2017 - Breeze moves to the cloud in Atlanta
- 03 Mar 2017 - Keeping up with ticketing technology
- 01 Mar 2017 - London's contactless payment goes global

- 24 Feb 2017 - Transport for London renews contactless payment processing contract
- 13 Jul 2016 - Cubic licences London's contactless ticketing technology
- 06 Jul 2016 - Mobile ticketing comes to New York commuter rail
- 20 Apr 2016 - Sydney to use London-style open payment technology

Lille rolls out Euro 2016 contactless Wristband Tickets; France

10 Jun. 2016

FRANCE: Contactless wristband tickets have been introduced on the Transpole metro, tram and bus networks in Lille in time for the UEFA Euro 2016 football championship. The city's Stade Pierre Mauroy is one of 10 participating venues, and will see six matches between June 12 and July 1, including one of the host nation's group matches on June 19.

Up to 300 000 visitors are expected to come to the city for the championship, and so transport operator Keolis Lille has introduced the wristbands, which are branded with 'Partenaire des Supporters' for a limited time. They will continue to be accepted after the end of the tournament, with top-up available at Transpole kiosks.

Gemalto is supplying its Celego technology, based on the Calypso international contactless ticketing standard. Payment is accepted when the wristband is touched on a reader.

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