URBAN MOBILITY INTERNATIONAL AND INDIAN ACTIVITIES

METRO NEWSLETTERS 57-66; May 2019

gathered by Dr. F. A. Wingler

METRO NEWSLETTERS

on

URBAN MOBILITY AS A SERVICE

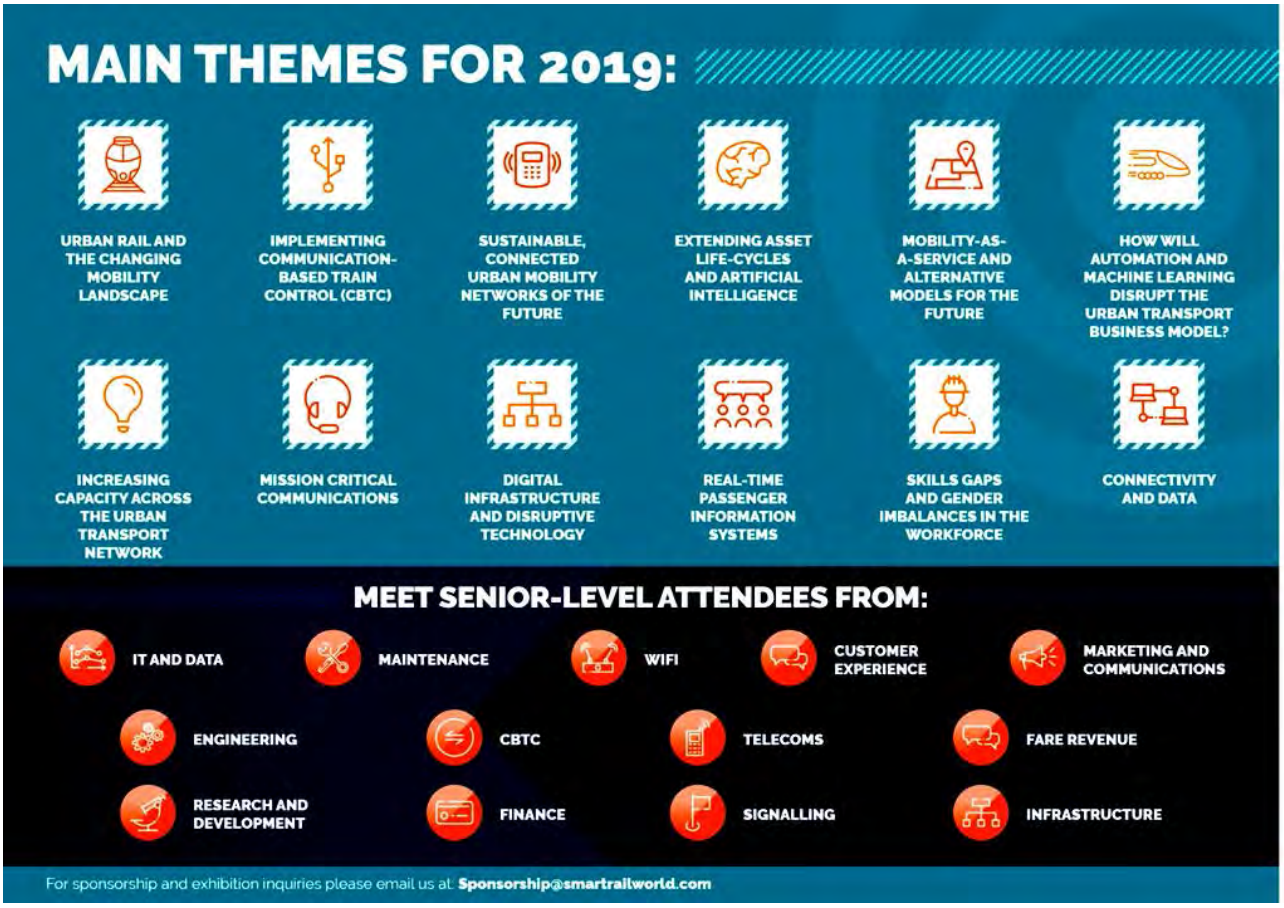
PUBLIC MULTIMODAL URBAN, SUBURBAN AND INTERURBAN PASSENGER TRANSIT SYSTEMS WITH METRO-BUS, LIGHT-RAIL, TRAM-TRAIN, METRO-RAIL, METRO-TRAIN, REGIONAL RAPID TRANSIT, COMMUTER-RAIL, ROPE-WAY/TRAIN, MAGLEV AND HOVERCRAFT TRANSIT/PEOPLE MOVER, WATER-METRO, AUTONOMOUS PEOPLE-MOVER

TRANSPORTATION AND ECONOMIC DEVELOPMENTS IN MODERN URBAN/MEGAPOLIS ENVIROMENT

METRO Newsletter by Dr. F.A. Wingler

METRO 56, April 2019

ACTIVITIES FOR URBAN MOBILITY AS A SERVICE; INTERNATIONAL



WHO SPONSORS AND EXHIBITS AT SMARTMETRO?

PREVIOUS SPONSORS INCLUDE:

BOMBARDIER SAMSUNG SIEMENS SYSTRA HUAWEI

Ansaldo STS A Hitachi Group Company setec CYLUS ALSTOM ikos Innovation & Technologies THALES

Alcatel·Lucent Enterprise ERICSSON egis voestalpine PROVER TECHNOLOGY voestalpine ONE STEP AHEAD

PREVIOUS EXHIBITORS INCLUDE:

CLEARSY SYSTEMS ENGINEERING COBHAM infor LUMINATOR TECHNOLOGY GROUP systerel TICKEY ADVANTECH Enabling an Intelligent Planet

COMPLY365 Mobilize What Matters COWI ANSYS HARTING Pushing Performance Metro Report LUCEOR WYLD MESH

For sponsorship and exhibition inquiries please email us at: Sponsorship@smartrailworld.com

8 of the World's most Eye-catching Rail and Metro Maps and the Stories behind them; International

Posted on Apr. 3, 2019

As readers of these pages will know, the rail industry and transport in general are undergoing a great deal of change. Changes that, in the main, help make operations smoother, safer and more predictable for all involved. For operators and passengers alike the growing availability of technology directly enables things that simply weren't on the table even a few years ago, with predictive maintenance and regenerative braking to mobile ticketing and online customer services just a few of the tech updates. Well, for this feature, we've decided to go with tradition and focus our attention on an intrinsic aspect of all rail networks, an area which has fundamentally changed very little over the years: maps.

The way in which maps are created, shared and viewed across the world has certainly developed thanks to the computers, websites and smartphones but it's fair to say that aesthetically they've held firm since the very first design. Here, SmartRail World has again turned its attention to some of the world's network maps that have caught our attention, with eight illustrating perfectly that although the routes they describe are very different, the design and overall feel incredibly familiar.

Denver

With a network that serves more than 2.8 million people in an area of around 2,400 square miles, Denver's state operator RTD opened its first light rail line more than two decades ago in 1994 – the 5-mile D Line. The latest, the University of Colorado A Line, followed 18 years later and became its first high-speed section of the network. Today, RTD's train network comprises 53 stations across 10 lines. To further boost its commuter services, the operator has announced its intention to extend the G Line by 11 miles to the west of downtown Denver.

Full size map

Hong Kong

Soon celebrating its 40th birthday, Hong Kong's MTR network has close to double the number of Denver's at 94, with overground and subterranean lines that link up the territory's three main islands. Setting the network apart from its contemporaries, Hong Kong's metro has had on-board Wi-Fi for the last 25 years, now offering a fast system that stays connected everywhere on the network. If progress continues in this area at the same rate, some have predicted that the introduction of the long-awaited 5G networks will be a matter of months rather than years.

Full size map

Washington D.C.

The US capital city's metro has 117 miles of track connecting connect 91 stations and is now in its fifth decade of operation. According to a report from the operator released at the end of 2018, the six-line Metro has replaced its oldest and most unreliable rolling stock, action that has led to its best railcar performance in eight years. Metro announced at the beginning of 2019 that crime on its network had dropped to its lowest levels in 19 years, thanks in large part to the introduction of technology and also the increasing willingness for passengers to report suspicious activity.

Full size map

Taipei

Clocking up approximately two million passenger trips every day, the Taiwan capital's light rail system connected more than 100 people by 2018 two years after opening in 1996. The operator announced in March that it would be giving one year's free travel to the lucky 10 billionth passenger, granting them unrestricted access to the Brown, Red, Green, Orange and Blue lines. In 2018, the train manufacturer Alstom announced that it had won a €378m contract to supply 19 of its Metropolis trains that will be governed by the French company's **Urbalis CBTC driverless Signalling System**

.**Full size map**

Valencia

Combining light railway, metro and tram, Metrovalencia's nine-line network is due to soon become 10, after reports that Ferrocarrils de la Generalitat Valenciana, the organisation that operates the metro, said that it will begin construction in April 2019. The work is due to be completed in 2021 and is partly funded by the European Union's European Regional Development Fund programme. A majority of the metro is overground, with around 15% of the 97-mile network operating underground. It's also capable of driverless operation, with four of the lines currently controlled automatically. **Full size map**

Munich

Known as the U-Bahn, the predominantly subterranean trains have been running in the Bavarian capital for close to 50 years and now serve in the region of 400 million passengers annually. Plans to expand the 96-station network – which connects with the overground S-Bahn light-rail service – by 20% were recently announced by the city, an upgrade that would see it add around 25 miles of track in around a decade's time. Under those plans, service frequency would be increased and would also carry more passengers, thanks to extending its trains by a fifth.

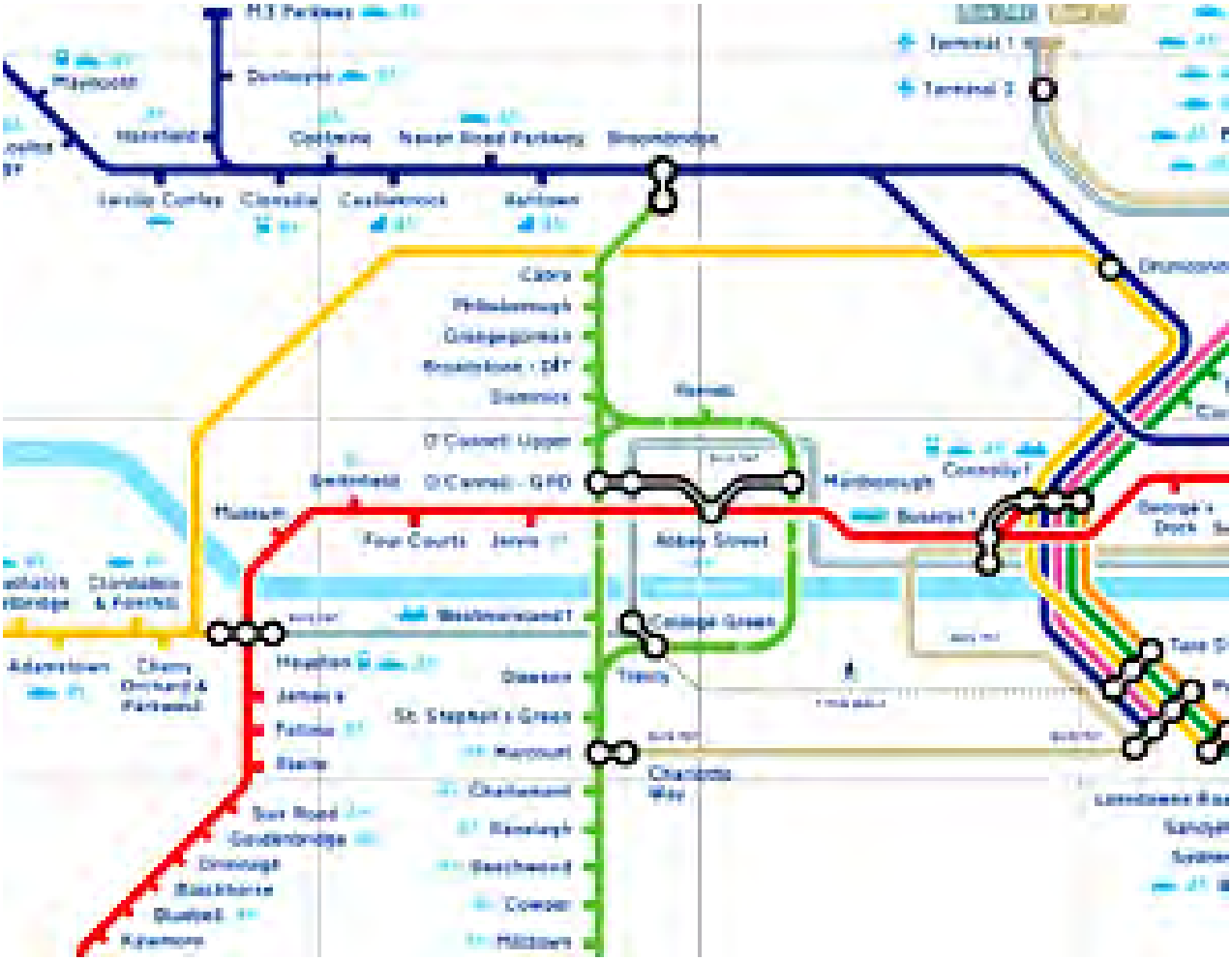
Full size map

Medellín

The newest of our featured networks, Medellín's began life in 1995 and has two lines with 27 stations. The network connects with Metrocable, the cable car that's done wonders for social mobility in the city by providing affordable transport to some of its poorest communities. In recent news, the city showed its commitment to staff training by introducing a state-of-the-art train simulator that enables apprentices to hone their driving skills. The system can tracks users' progress in a range of climactic conditions on journeys that are exact replicas of the network's route.

.**Full size map**

Dublin



Announced late last year, plans for a new privately-funded six-line metro has been scheduled to enter service by 2025. In addition to lowering its reliance on the public purse,Dublin Metro would also be built much quicker than other comparably-sized networks. Cutting the construction time will also be possible thanks to a repeat of the construction method used on the Madrid Metro – the Spanish capital's 75-mile network was built in seven years and "at a fraction of the price" that Transport for London paid for the Jubilee Line", according to its architect, Manuel Melis Maynar.

Full size map

Tehran Metro Line 6 inaugurated; Iran

Apr. 8, 2019
Written by Keith Barrow

The 9 km line runs south from an interchange with Line 4 at Shohada Square to Dolat Abad. At present the only operational intermediate station is at Besat, but six stations are under construction. A further 15 km stretch of Line 6 is expected to open by March 2020. When all phases are completed, Line 6 will […]

The 9 km line runs south from an interchange with Line 4 at Shohada Square to Dolat Abad. At present the only operational intermediate station is at Besat, but six stations are under construction.

A further 15 km stretch of Line 6 is expected to open by March 2020.

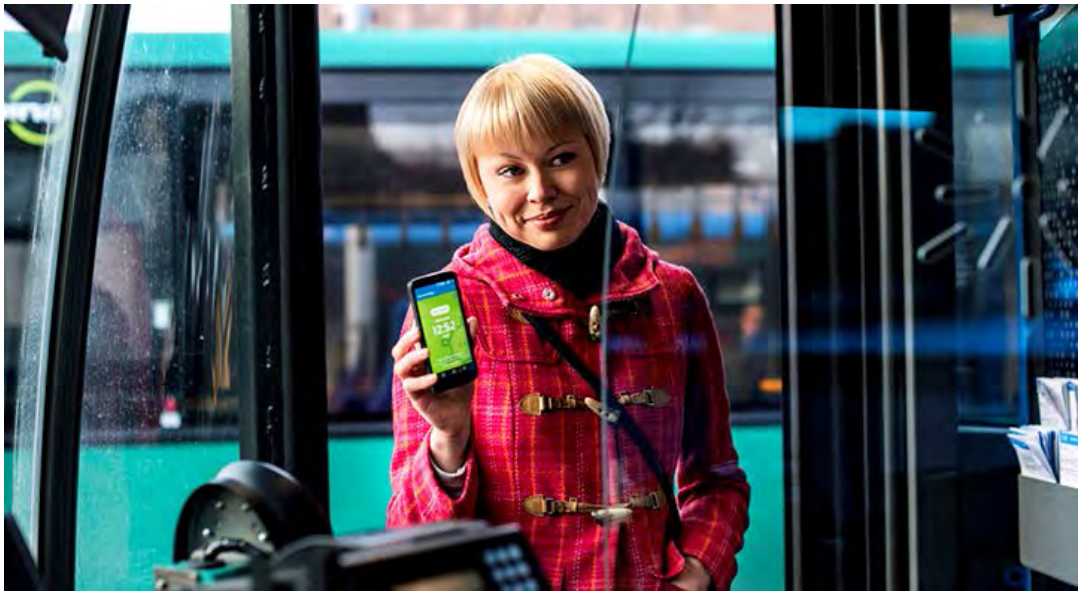
When all phases are completed, Line 6 will be 38 km long with 27 stations, making it the longest metro line in Tehran.

The line will link Sulqan in the northwest with Shahr-e-Rey in the southeast, interchanging with the existing lines 1, 2, 3 and 4 as well as the future Line 7.

Helsinki Region Transport HSL to launch a MaaS (Mobility as a Service) Interface open to everyone on 2 April 2018, Finland

21.02.2018 - Edited: 21.02.2018

HSL Helsinki Region Transport will open a retail interface for single tickets, which will be open to all interested transport operators. The interface is already available for testing. For commercial purposes, the interface will open on 2 April. At the same time, HSL will start an IdeaLab program for mobility services to create and test new ideas together with other operators.



HSL is currently building the world's first completely open public transport ticketing interface. The interface will allow operators in Finland and abroad to incorporate HSL's tickets into their array of services. The interface will open for commercial purposes at https://sales-api.hsl.fi on 2 April 2018. HSL is also inviting operators outside the transport sector to develop innovative, new mobility services using the interface. Technical development of the interface will continue throughout the year. In the future, other tickets may be made available via the interface, in addition to single tickets.

On 19 February 2018, a so called sandbox environment was opened whereby developers can acquaint themselves with the characteristics of the interface's production environment, and test the compatibility of their own interfaces with the HSL Open Maas (Mobility as a Service) interface.

Schedule for HSL's Open Maas service package:

- 19 Feb 2018 API Docs and Sandbox API opened at https://sales-api.hsl.fi
- 12 March 2018 Client Library and application testing open
- 2 April 2018 Open Maas Portal and Open Maas interface with production and payment facilities available

HSL has solid expertise with and traditions in open interfaces. For example, the highly popular journey planner service, Reittiopas, has already been using open interfaces for 15 years.

"A mobile sales API involves solving a range of crucial technological and business issues. The service needs to be easy for third parties, so that it can be used by various operators, not just technology companies. At the same time, we need to ensure that the interface

poses no information security risks or risks to HSL's business activities or the financial position of the owner municipalities," emphasizes Juha Lamminkari, HSL's System Architect.

At the same time, HSL will start an Idea Lab program for mobility services, and invites transport market operators from Finland and abroad to participate in the program. The Idea Lab project tests the operating models of mobility services, together with HSL. Jemina Uusitalo, HSL's MaaS Project Manager, has been selected to lead the program. Uusitalo will join HSL on 1 March 2018 from her current position in the consulting company Eera.

"I'm extremely excited about my new role as HSL's MaaS Project Manager and equally excited about the new mobility services we'll be able to develop for the HSL area through various pilots and cooperation models. The transport sector is undergoing a major transition and it's exciting to be part of reshaping the entire industry," says Uusitalo.

As part of the Idea Lab, there will be an innovation contest for mobility services, from which HSL will select the ideas to be piloted. The ideas can apply to physical mobility services, ticketing and marketing collaboration, combination and relaying services for travel chains, or experimenting with automated transport. The experiences from the pilots will be assessed and used as a basis for further developing HSL's services. The selected participants will have the opportunity to develop their business activities in a dynamic HSL environment, based on a million daily journeys and 370 million journeys a year.

Thai Light Rail Projects gain royal Assent; Thailand

Apr. 10, 2019
Written by David Burroughs

A ROYAL decree issued by the king of Thailand, Maha Vajiralongkorn, has approved the construction of four light rail lines in Chiang Mai, Phang Nga, Phuket and Nakhon Ratchasima province.

Related Posts
Mauritius light rail set for September opening
Apr 9, 2019 | Light Rail

The decree gives Mass Rapid Transit Authority of Thailand a mandate to develop the lines, although no timeframe was given.

The royal approval was issued on April 4, effective immediately.

The projects include the Chiang Mai LRT Red Line (Airport – Chinag Mai University – International Convention Centre) and the Chiang Mai LRT Green Line (Mae Jo – Kad Luang – Airport).

Categories: AsiaLight RailNews
Tags: Chiang Mai Nakhon Ratchasima Phang Nga Phuket Thailand

Mauritius Light Rail set for September opening; Mauritius

Apr. 9, 2019
Written by Keith Barrow

MAURITIUS' Minister of public Infrastructure and Land Transport Mr Nandcoomar Bodha confirmed on April 8 that the first phase of the island's Metro Express light rail line will open by September.

Bodha said at a press conference in Ebene that construction of the 13 km Phase 1 between the capital Port Louis and Rose Hill is now 70%-complete.

The first of 18 CAF Urbos low-floor LRVs is due to arrive in Mauritius in July and six vehicles will be delivered by October.

The Phase 2A section from Rose Hill to Quatre Bornes will open next year, with Phase 2A to Curepipe due for completion by September 2021.

The entire 19-station line is being constructed **by Larsen & Toubro (L&T), India**, under a $US 572m contract awarded in July 2017. In addition to rolling stock, CAF is supplying signalling, an automatic vehicle location system, a transit system signal priority system, equipment for the depot at Richelieu, and a driving simulator.

Categories: AfricaLight RailNews

Tags: CAF Larsen and Toubro Mauritius

Melbourne Grade Separation Contract awarded; Australia

09 Apr. 2019

AUSTRALIA: The Southern Program Alliance consortium of Acciona Geotech subsidiary Coleman Rail, Lendlease and WSP has been awarded a A$536m contract for grade separation works in southeast Melbourne.

The contract announced on April 1 is an extension of a A$588m contract to remove level crossings which had been won by the consortium in January 2018.

The latest contract includes the removal of three level crossings, reconstruction of Cheltenham and Mentone stations and the provision of more than 3 km of walking and cycle paths, new parking spaces and a potential residential and commercial development.

Related news

- 21 Aug 2018 - Mernda extension completed
- 18 Jul 2017 - Melbourne Metro tunnel contractors selected
- 09 Feb 2016 - Melbourne grade separation completed

Previous news story
Privately backed light rail scheme progresses in Khon Kaen
Next news story
Messina tramway saved from closure

Melbourne Grade Separation completed; Australia

09 Feb. 2016

Photo: John Kirk

AUSTRALIA: The replacement Gardiner station in Melbourne has been opened, and the first grade separation completed under a programme to eliminate 50 level crossings which had been announced as part of the 2014 election campaign.

The railway has been rebuilt on a new sunken alignment, with the platforms at the replacement station opened on January 19 accessed via lifts as well as stairs. The car park is being rebuilt on the old station site, and a new foot and cycle path provided. Three former tram stops have been consolidated into one, located adjacent to the new station which has rail and tram passenger information displays.

Removal of the Burke Road level crossing enables traffic including trams to move unimpeded along the busy road, where 150 train movements per day had caused the gates to be down for 40 min during the peak hour, disrupting an estimated 25 000 road vehicles and 180 trams.

The project forms part of a package that includes removing crossings at Ormond, McKinnon and Bentleigh stations at a cost of A$524m. The contract was awarded to John Holland in alliance with Kellogg Brown & Root, VicRoads, MTM and PTV.

Construction is underway at seven level crossings, with the government expecting work on 30 of the 50 crossings to be underway or completed by 2018.

Related news

- 09 Apr 2019 - Melbourne grade separation contract awarded
- 15 Mar 2016 - Melbourne high capacity train order increased

- 28 Apr 2015 - Melbourne Metro Rail advisers appointed

Previous news story
Azur metro trains begin carrying passengers
Next news story
Siemens CBTC for Paris RER Line E
Most read

- 29 Mar 2019 - Stadler to supply up to 354 metro cars to Atlanta »
- 11 Feb 2019 - Hyundai Rotem selected for Warszawa tram contract »
- 20 Mar 2019 - First stage of 'highly complex' London Underground resignalling goes live »
- 13 Feb 2019 - Autonomous tram under development in Russia »

Privately backed Light Rail (LRT) Scheme progresses in Khon Kaen; Thailand

09 Apr. 2019

Photo: Shutterstock

THAILAND: The Prime Minister's Office has granted approval for a proposed light rail route to be developed in Khon Kaen. Construction is expected to begin in the final quarter of 2019.

The 22·6 km route would run on the median strip of the north-south main road that bisects the city. There would be 18 stops, including one in the grounds of Khon Kaen University.

The project is being promoted by Khon Kaen Transit System Co Ltd, which was established in March 2017 with 5m baht in capital provided by the five municipalities in Khon Kaen. The organisation is modelled on Krungthep Thanakom Co, which is the Bangkok Metropolitan Administration's investment arm that owns and operates the capital's bus rapid transit network.

KKTS was established by the Khon Kaen Think Tank, which comprises 20 local business owners, politicians and academics. None of these members belong to a political party, in order to ensure that the light rail scheme remains politically neutral.

Private Financing

Cabinet approval for the starter line was granted in October 2017, and KKTS is currently in the process of leasing land from the State Railway of Thailand and the Ministry of Agriculture to add to the land already acquired from the five municipalities.

Light rail was selected in preference to a metro as it is cheaper to build. The cost is estimated at 15bn baht, with the five municipalities contributing a total of 4·5bn baht. The remainder would be borrowed from overseas investment funds.

Suradech Taweesaengsakulthai, CEO of CHO Thavee and a founding member of KKTT told *Metro Report International* that KKTS is in negotiations with three potential investors. One of these is Chinese, one is European and the other is a group of European and US investors.

KKTS envisages two years of construction followed by two years of operations, before the company is listed on the stock exchange. This would give the initial investors an option to sell their stakes at this point should they wish to do so. Suradech estimates the internal rate of return at 2% in the initial years of operations, with a further 11% attainable from proceeds from retail space and advertising.

If light rail operations prove profitable, the municipalities would earn money that could be reinvested in other urban projects. The line would need to carry 15 000 passengers a day to break even, estimates Sumet Ongkittikul of the Thailand Development Research Institute think tank.

A Model for other Cities

The Khon Kaen model is being studied by 14 other provincial cities in Thailand, and KKTT believes that it could serve as a template for an urban public transport projects elsewhere. While Bangkok has an extensive metro network, no urban rail exists in other cities in Thailand.

Related news

- 07 Dec 2018 - Bangkok Sukhumvit Line reaches Kheha
- 20 Dec 2017 - Siemens to supply Bangkok airport peoplemover fleet
- 14 Aug 2017 - Bombardier to supply Bangkok monorail vehicles

Siemens to supply Bangkok Airport Rubber tired People Mover Fleet; Thailand

20 Dec. 2017

THAILAND: Interlink Communication has awarded Siemens a contract to supply rolling stock and signalling for a peoplemover to be built at Suvarnabhumi Airport in Bangkok.

Due to open in 2020, the 1 km driverless peoplemover will connect the current terminal with a new terminal. Siemens is to supply six two-car rubber-tyred trainsets from its Wien plant, as well as **CBTC signalling**.

The peoplemover would operate 24 h a day and has a design capacity of 3 590 passengers/h per direction.

Tatra-Yug Tram presented in Kyiv; Ukraine

04 Apr. 2019

UKRAINE: Kyiv Mayor Vitali Klitschko and Deputy Mayor Dmytro Davtyan officially inaugurated a Tatra-Yug tram for the city on April 2.

On December 18 operator Kyivpastrans signed a 428·9m hryvnia contract with Tatra-Yug for the supply of 10 trams to replace some of the current fleet operating on the city's 'fast tram' route serving Troeshchina on the left bank of the River Dnipro.

The 70% low-floor three-section K1M6 tram is 26·8 m long and 2 500 mm wide with capacity for 267 passengers. It is equipped with a wheelchair space, air-conditioning, wi-fi, a passenger information system and LED lighting. Maximum speed is 75 km/h, and **emergency traction batteries enable 1 km of operation without external power supply**.

The K1M6 is Tatra-Yug's latest model. It was presented in May 2017 before undertaking tests on the network in Kamianske.

Related news

- 12 Feb 2019 - Tatra-Yug delivers tram to Alexandria
- 28 Nov 2017 - Latest Tatra-Yug tram tested in Kamianske
- 18 Jul 2017 - Kyiv orders more Pesa Fokstrot trams
- 14 Jun 2017 - Kyiv orders more Elektron trams
- 10 May 2017 - Tatra-Yug presents new tram model

Cubic awarded Irish mobile Ticketing Contract; Ireland

IRELAND: The National Transport Authority has awarded Cubic Transportation Systems a contract worth more than US$4m to supply and maintain a mobile ticketing system.

This will included a mobile app enabling users to purchase and present tickets for multiple operators. It is to be piloted on a number of Bus Éireann regional routes later this year, with further routes to be added on a phased basis.

The technology is based on systems which Cubic has supplied to Los Angeles, Washington DC, Chicago, New York, Köln and Brisbane, and the company's experience of providing ticketing management and distribution services for national railway Iarnród Éireann.

The contract forms part of the first phase of NTA's Next Generation Ticketing programme. 'The introduction of mobile ticketing represents a significant development in public transport ticketing in Ireland, but it is just the first of many changes in ticketing that we believe will enhance the provision of public transport across Ireland', said NTA Chief Executive Anne Graham.

The authority told *Metro Report International* that the main focus of the latest contract was on buses, as other forms of account-based ticketing are thought to be more suitable for future use on the rail network and Dublin's trams.

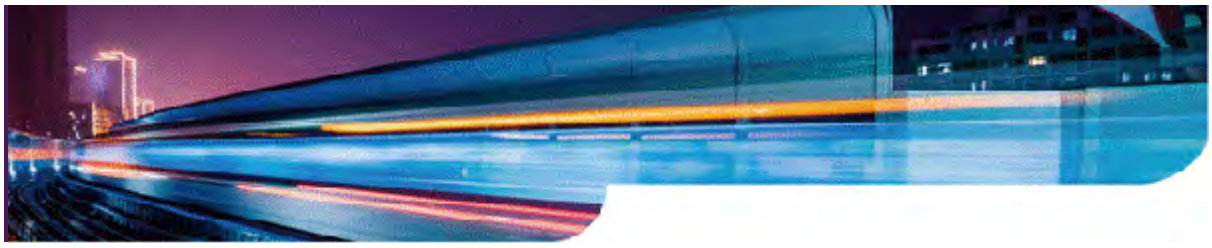
Related news

- 05 Dec 2018 - Contactless payment arrives on Sydney Trains
- 12 Sep 2018 - San Francisco fare collection to be modernised
- 25 Jun 2018 - Cubic selected for Queensland ticketing contract
- 23 Nov 2017 - Cubic to provide Rhein-Sieg ticketing app
- 26 Oct 2017 - New York to get London-style fare collection system

DRIVING SMART RAIL INTO AN INTELLIGENT FUTURE; China

The 14th China International Exhibition of
Urban & Intercity Mass Transit
November 12th - 14th 2019 | Shanghai

GRASP THE FUTURE OF MASS TRANSIT AT RAIL+METRO CHINA 2019!



RAIL TRANSIT IS USHERING IN A GREAT NEW ERA IN CHINA

The pace of development in China over the last few years is truly staggering, and on track to continue as the Asian Century progresses. Nowhere is this clearer than in the expansion of coverage and the increase in speed and efficiency of the country's transportation infrastructure, in itself a key factor in driving forward the pace of development of any number of other sectors and industries.

By 2020, China's railway lines under operation will surpass 150,000 kilometers, or almost four times the circumference of the planet. High-speed railway lines will also exceed 30,000 kilometers by next year, connecting more than 80% of China's cities with populations above 200,000 people

.

Within China's cities, by the end of last year 160 lines totaling 5,800 kilometers of track covering dozens of cities across China were operational, now carrying more than 18 billion passengers every year. In 2018, many cities unveiled new subway lines, with 22 new lines adding hundreds of kilometers of subterranean track laid underneath the country's busiest metropolises. And the operating mileage of China's metropolitan rail will reach 7,700 kilometers next year

.

By 2035, China will have the most advanced and well-developed railway network in the world, extending comprehensive rail transit coverage between all its cities as well as basic coverage pervading much of the country, whilst providing urban-center rapid access within all of its major cities.

DRIVING SMART RAIL INTO AN INTELLIGENT FUTURE

The 14th China International Exhibition of for Intercity and Urban Mass Transit, also known as ***Rail+Metro China 2019***, will take place November 12th - 14th, 2019. This year the show's theme will focus on ***Driving Smart Rail into an Intelligent Future***. Over 200 exhibitors and 20,000 visitors are expected to participate in the show

.

Rail+Metro China launched in 2002 in Shanghai, with the support of China's Ministry of Transport, the National Reform & Development Commission and the Shanghai Municipal Government. Seventeen years later, it has become one of the most authoritative and established communications platform for China's urban and intercity rail industries, enjoying a strong reputation throughout the Asia-Pacific region

.

The China International Railway Conference for Urban & Intercity Transit, or ***CIRC***, is an influential multi-platform conference taking place alongside ***Rail+Metro China*** with the endorsement of APEC and the firm support of China's Ministry of Transport and the Chinese Academy of Sciences. CIRC 2018 presented a line-up 120 industry leaders, experts and influencers as speakers, with over 1500 delegates in attendance from around the world

.

In November 2019, CIRC 2019 will host a series of forums, seminars and workshops covering everything from railway investment & construction to urban railway operation and maintenance, modern trams to smart rail technology and much much more

.

This year's show will hit new heights, bringing together the rail industry in an exploratory celebration of insight and possibility.

Join us to grasp the future

EXHIBITS PROFILE

- Rik-bound Vehicles
- Subassemblies and Components
- Signalling, Communication & IT Systems
- Interiors
- Maintenance and Repair
- Energy/Electrotechnology
- Platform and Public Services
- Infrastructure/Tunnel Engineering

2018 REVIEW

Click here for more information

For inquires, to reserve your place, book your booth or advertise, please contact:

Mr. Dan Scrimgeour Mr. Bill Wu Ms. Jessie Hu

Tel: +86 – 21 – 6295 1237 / 6295 1059 / 6295 1060

Email: dan@shanghai-intex.com / wubing@shanghai-intex.com / huxiaoping@shanghai-intex.com

Rail+Metro China is organised by **Shanghai Intex Exhibition, Co., Ltd.**
Floor 11, New Town Mansion, 55 Lou Shan Guan Road, Shanghai 200336, P.R.China
T : 86-21-6295 6677 F : 86-21-6295 1230

METRO NEWSLETTERS

on

URBAN MOBILITY AS A SERVICE

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

TRANSPORTATION AND ECONOMIC DEVELOPMENTS IN MODERN URBAN/MEGAPOLIS ENVIROMENT

METRO Newsletter by Dr. F.A. Wingler
METRO 58, April 2019

Reshaping Urban Mobility for Metropolis of Future

PART I: ACTIVITIES FOR URBAN MOBILITY AS A SERVICE IN INDIA

Ropeways vying to be alternative Means of Transport, want a Slice of Road Cess; India

Mamuni Das New Delhi | Updated on August 24, 2018 Published on August 24, 2018

Access to Funds the Centre has included Ropeways as Infrastructure, that may be funded through the Central Road and Infrastructure Fund - THE HINDU

Centre looking to use them for crucial last-Mile Connectivity in tough Terrain:

India may soon have a brand new set of ropeways across select inaccessible regions of the North-East, Andhra Pradesh, Tamil Nadu, Kerala, Goa, and Maharashtra. The plan comes about as the government realises that these aerial cable-cars can do much more than serve tourists and adventure-seekers and ropeways can actually become the crucial last mile connectors in tough terrain.

And to build some of these, the ropeways sector may stake a claim to a share of the road-cess, (rechristened infrastructure fund early this year) citing the ground that after all they are serving as roads, where roads can't be built, albeit on air.

"We are at different stages of preparing feasibility and viability and project reports for building ropeways in specific areas in these States,' said an official of the Indian Port Rail Corporation Ltd (IPRCL), a Shipping Ministry arm that regulates the construction of ropeways and is in charge of making them safer. This is in addition to IPRCL's original responsibility to speed up port-rail connectivity projects.

Ropeways have largely been used for tourism and recreational purposes. But, this is changing as they are now being seen as possible option for urban transport, particularly for last mile connectivity in hilly areas and to improve access to other services. This has spurred a renewed interest in ropeways.

Common contract

“IPRCL is actively involved with NITI Aayog to make a common contract agreement,” said the official. The contract to be signed between a private operator and the government will enable ropeway projects being implemented to claim subsidy. Subsidies will be needed now because for ropeways to become useful as urban transport, the fares will have to be affordable.

The Centre has already included ropeways among the infrastructure which may be funded through the Central Road and Infrastructure Fund, the erstwhile Central Road Fund. Ropeways are environment-friendly and when they connect the last mile to far-flung areas, they may become strong claimant for CRIF as well, said an industry executive. Access to the road fund has already been approved for waterways.

Ropeway locations which IPRCL is evaluating include Elephanta Caves, Mumbai, Maharashtra; Kanyakumari in Tamil Nadu; Langolceiraoching-Marjing ching, and Sendra to Thanga, Chaoba Ching, Loktak in Manipur; Bermpark-Bhawani island in Andhra Pradesh; Vasco da Gama to Dona Paula in Goa; and Kochi.

While IPRCL is looking for a tie-up with a company adhering to European standards of safety, it is also involved with the Bureau of Indian Standards to update the safety standards for ropeways to global standards. IPRCL is also importing European technology with a ‘Make in India’ theme. European firms like Dopplemayr and Poma, which had bagged Winter Olympics and other projects in China, are vying for a tie-up with IPRCL.

IPRCL has set up a specialised team, with an ability to manage projects and be the independent engineers. It is also in the process of hiring a legal consultant to draft a Central legislation on ropeways. This is being done to ensure uniformity of the legal framework available across States and to ensure adherence to a higher standard of safety. At present, States have different legislations that guide the ropeways.

The Indian ropeway makers have welcomed the ropeway draft contract. They, however, rue that the provision of subsidy is linked to adoption of European or CEN technology standards. They have also raised concerns like the high cost of third party inspections, where the inspectors have to be flown in from other countries.

Published on August 24, 2018

12 major Ropeway and Cable Car Systems across the Country in India; India

The aerial tramway is known as cable car, Gondola lift and rope way across the world, It is supported and propelled by a loop of steel cable which is strung between two stations. Cable car systems have its type of uses like Passenger lift, Ropeway conveyor and Urban gondola transport systems. India is one of the major markets for Rope Way and Cablecar Systems, All the major hill stations and tourist spots are installing the Gondola lift for better transport facilities. Major rope way in India are situated in the hill top temples such as Udaipur Rope Way at Kerni Mata Temple and Ropeway at Chandi Devi Temple in

Haridwar and other are Nainital Ropeway, Timber Trail at Parwanoo and Ropeway in Bhopal.

Gulmarg Gondola

The Gulmarg Gondola Cable Car is the second highest cable car in the world and Asia's highest and longest cable car project. Gulmarg rope way starts from Kongdoori Mountain, part of nearby Afarwat Peak (4,200 m or 13,780 ft) and the ferries runs towards Gulmarg and Aparwath Peak station with total length of 2.5 km.

Auli Cable Car

Auli, the youngest Hill station and best winter season destination among the Himalayan states, has India's longest cable car or ropeway with the total length of 4 km. The ropeway of Auli runs from Joshimath to Auli and offers stunning and breathtaking panoramic view of Nanda Devi snow peaks.

Manali Ropeway

The rope way-cum-ski center at beautiful Solang valley of Manali hill station is the major attraction of the city along with other winter sports and paragliding, parachuting and horse riding. Ropeway at Solang valley offers breath-taking and enchanting sights, snow clad mountains, river stream and amazing world of beautiful nature.

Raigad Ropeway

The Raigad Fort rope way is a non-profit endeavor, the only one of its kind in India and provides passenger transportation to the Raigad fort, the capital of Chhatrapati Shivaji Maharaj's empire. Another rope way in Matheran hill station in Maharashtra is proposed project and considered to be the longest ropeway in India.

Ropeway At Dhuandhaar

Dhuandhaar is the famous waterfalls located at the marble city of Jabalpur in Madhya Pradesh. Rope way over the Dhuan Dhaar falls offers a short ride but sightseeing of Falls,Bhedaghat Marble Rocks and holy Narmada river is awesome.

Cable Car in Mussoorie

Mussoorie, Queen of the Hills is a most famous hill station in the Dehradun District of Uttarakhand. Along with other major spots, another tourist attraction in Mussoorie is the Mussoorie Cable Car or ropeway in Gunhill.

Gangtok Ropeway

The Damovar Ropeway in Gangtok is a cable car located at Deorali and offers a ride from Deorali to Tashiling over the city of lower and upper Gangtok. Gangtok Ropeway one of the major tourist attractions of the city and provides a beautiful view around.

Ropeway of Rajgir

The city of Rajgir was the first capital of the kingdom of Magadha, located in the Nalanda district of Bihar. Rope way of Rajgir is one of the major attraction of the region and connects Vishwa Shanti Stupa,Makhdoom Kund and monasteries. It also offers great view of valley surrounded by seven hills named as Vaibhara, Ratna, Saila, Sona, Udaya, Chhatha, and Vipula.

Glenmorgan Ropeway

Glenmorgan is a beautiful valley with a big lake, covered by three peaks and offers best scenic view in Ooty,Tamil Nadu. The 3.0 kilometre long rope way from Singara to Glenmorgan is major attractions and offers panoramic views of the Mudumalai National Park.

Darjeeling Ropeway

Darjeeling Ropeway is also known as Darjeeling-Rangit Valley Passenger Cable Car, connects Darjeeling with Singla banks of the Ramman river. The rope way offers beautiful views of the hills and the valleys around Darjeeling, Rope way also passed over tea gardens,dense forests, mountain ridges, water falls and flowing rivers.

Srisailam Ropeway

Rope way in Srisailam is one of the best rope way in India and offers most beautiful view of mountain, river and dense green forest around it. Srisailam is holy place and famous for Bhramaramba Mallikarjunaswamy Temple, one of the 12 Jyotirlinga temples dedicated to Lord Shiva and Srisailam Dam built across River Krishna situated in Nallamala Hills of Andhra Pradesh.

Malampuzha Udan Khatola

The Udan Khatola of Malampuzha, Kerala is only one of the major attraction of Malampuzha,Snake Park,Malampuzha Dam,Malampuzha Garden and Rock Garden are being other. Malampuzha ropeway run parallel to Malampuzha dam in Palakkad district and offers amazing view of Malampuzha Garden and reservoir.

Last year Kashmir gets a dream ropeway to the shrine of Makhdoom Sahib, It is Kashmir Valley's first ropeway and State's second tourist-carrier. Image source: TheHindu

PART II: ACTIVITIES FOR URBAN MOBILITY AS A SERVICE; INTERNATIONAL

Reshaping Urban Mobility for the Metropolis of the Future - Central Principles of integrated Urban Mobility as a Service (MaaS); International

Excerpts from International Railway Journal, February 2019, page 40.

Reshaping Urban Mobility for Metropolis of Future

A central principle of integrated **Urban Mobility** is the need or collaboration between modes instead of competition. Technology can only support seamless intermodal journeys if the barriers to integration are removed. Like many aspects of smart cities, this is a matter of public policy and not something, that can be left to the market to regulate.

In recent years, Finland has emerged as a country at the cutting edge of smart **Urban Mobility Policy.** In January 2018, the Finland government introduced the Transport Services Act, which requires public transport operators to open up their data and passenger information systems and ensure that they are interoperable with those of other operators. Following the introduction of the new law, UBER returned to Helsinki, but in common with all public transport providers, the right-hailing firm is legally obliged to open its Application Programming Interface, API, and allow third party providers to buy and resell UBER rides though their own applications.

“The Transport Services Act is, to a very large extend, about preparing for the future” Mrs. Anne Berner, Finland`s Transport and Communication Minister, said in May 2017. “Our legislation has to be flexible so that all parts of the transport system will work together. This Act will give us a genuine opportunity to make Urban Mobility a comprehensive service for the customers. Finland is a pioneer in this work, which gives us a competitive edge”.

This regulatory invention supports the development of **Urban Mobility as a Service, MaaS**, integrating end-to-end trip planning, booking ticketing and payment across all public and private transport services via a smart-phone app. Helsinki is a city to provide a full-scale MaaS offering, and today there are more than 45 000 users of the city`s WHIM APP, 5100 of whom pay a monthly fee for the service.

Helsinki is an example of governance and technology working in unison in public transport. It will be crucial for other cities to carefully maintain this balance in the digital age.

Good Governance is every bit as essential and empowering as the technological assets, but one has to have the technology to stay relevant. For Helsinki it is clear to see a complete transformation in the Urban Transport Sector within the coming years.

While the term ***SMART CITIES*** (which are also emerging in India) might interfere notions of hidden forces controlling even the minutest aspects of daily life, the concept is less like a science fiction movie and more finding a balance between technology, governance and the needs of people and business.

The ability of local governments and other stakeholders to develop robust smart cities strategies will be crucial in addressing the future challenges facing the world`growing urban population.

Public Transport in Helsinki; Finland

From Wikipedia, the free Encyclopedia

Helsinki Metro Train

Public Transport in Helsinki consists of bus, tram, metro, local railway and ferry services. The system is managed by Helsinki Region Transport (Finnish: *Helsingin seudun liikenne*, or HSL) and covers Helsinki, Espoo, Kauniainen, Vantaa and the outlying Kerava, Kirkkonummi and Sipoo.

Volvo B8RLE 8900LE tri-Axle bus in Hakaniemi, Helsinki

Helsinki is currently the only city in Finland to have a tram system. The city of Turku dismantled its tram system in 1972, and Finland lost the city of Vyborg to the USSR in World War II and the city subsequently withdrew its trams in 1957. In 2017, construction started on a tram line in the city of Tampere.

50% of commuting trips within the city limits of Helsinki are made using public transport and only 28% using a private car, while 48% of the households have access to a car. The ridership is typical to a European city, but if Helsinki were in U.S., it would have the second highest ridership after New York. Partly due to lack of trams or rapid transit outside the Helsinki Region, the ridership in other cities in Finland is significantly lower.

The Helsinki Metro, opened in 1982, was the first, and so far the only, rapid-transit metro system in all of Finland. The metro currently serves only the eastern suburbs and some areas close to the city center. For the first 16 years of its existence, the line was topologically only one straight line, but in 1998 a branch to the eastern suburb of Vuosaari was opened.

The construction of the long-debated western extension of the metro system into southern parts of Espoo was approved by Espoo City Council in 2006. The eight-station first phase was opened in November 2017. The second phase which extends metro service west to Kivenlahti, is under construction. Helsinki is also planning to extend the existing metro line from its eastern terminus at Mellunkylä to Östersundom, an area annexed by Helsinki in 2009 for the purpose of building a large new planned community.

Local trains operate on grade-separated, dedicated tracks on three rail lines that radiate out from the Helsinki Central railway station. Most routes offer rapid-transit-like service with a peak headway of 10 or 15 minutes, the last trains departing from Helsinki city center only after 1 am, or 4 am on weekend nights. A service to the Helsinki Airport began in July 2015, when the Ring Rail Line extension to the system opened. A number of the local and regional trains run further out to towns as far north as Riihimäki and Lahti and as far west as Karis (Karjaa) on tracks shared with long-distance trains. These regional services have headways of up to one hour and often more limited operating hours.

Long-distance trains depart from the Central Railway Station and Pasila railway station to destinations across Finland. Intercity trains offer connections to major Finnish cities and international services to Saint Petersburg and Moscow in Russia.

A tunnel has been proposed to connect Helsinki with Tallinn, though the proposal is still in the investigation phase.

Bus Services

Trunk Bus Lines

Helsingin Bussiliikenne bus on HSL trunk line 550, on the day the traffic started with the new fleet and image.

In August 2013, HSL launched the first trunk bus route, the orbital line 550, formerly branded *Jokeri*. The trunk lines are meant to provide "metro-like" service with very short headways and a distinguishable fleet. The second orbital trunk line, number 560, opened in August 2015, and HSL is planning for a number of further lines in the coming years.

Regular Bus Lines

Helsingin Bussiliikenne bus on HSL Helsinki internal line 75.

The bus is in HSL colourscheme, which is a requirement for all new buses offered in tenders.

A Helsingin Bussiliikenne bus on line 93 at Itäkeskus

Internal bus routes of Helsinki can be found almost anywhere in Helsinki. For some parts of the city, even high-density, these buses provide the backbone of the public transportation system.

The routes are drawn and the timetables set by HSL, but operated by independent companies. HSL tenders a route or a set of routes and the company offering to operate the route for the best quality-price ratio will get the contract. The quality is measured with a pointing system, which gives points for such aspects as the quietness, environmental efficiency and the size of the buses that would be used. The biggest bus operators are Nobina Finland, Veolia Transport Finland and Helsingin Bussiliikenne (HelB). These companies run a majority of the contract services. One rapidly expanding company is the VR (state rail) owned Pohjolan Liikenne, which has recently been very successful with the tendering. Mostly the expansion has been at the cost of HelB.

Many of the buses operating in eastern Helsinki act as feeder lines for the Helsinki Metro. Nearly all other routes have the other end of their lines in the downtown near the Helsinki Central railway station. Such exceptions are present as dedicated lines operating directly from a suburb to another past the centre (for example Helsinki buses 51-54, 56-59).

The line numbers for the internal lines contain two digits and for some a letter.

Most lines are operated between 5:30 and 23:30, the most popular between 5:00 and 1:30. In daytime outside of rush hours the basic interval for buses is mostly either 10, 15, 20, 30 or 60 minutes depending on the length and the demand of the line. Nighttime lines which operate only from 23:30 to 1:30 (and sometimes early morning) are signified by letter N. Recently the tradition of having designated night routes has been broken and replaced with N-variants of daytime routes.

Other letters include:

A: lengthened or clockwise-circular route
B: shortened or anti-clockwise-circular route
K: exception in route, often insignificant
T: trams to terminal (4T, 6T), 100-series buses via Lauttasaari
V: faster or more direct route
Z: faster or more direct route (usually along highway)

Helsinki bus terminals include Kamppi (surface area), Rautatientori, Elielinaukio and Hakaniemi. Larger metro stations have their own feeder bus terminals.

Outside Helsinki, routes staying within a city have two numbers as well, except for Vantaa, where all inner routes were changed to have three numbers in August 2015. HSL is abolishing this by renumbering the routes within the decade.

Regional Services

The regional bus lines are today managed by HSL in similar manner to the management of the internal lines of Helsinki. The regional lines are specially designed for moving people between important points in the metropolitan area and for the sole purpose of getting to downtown Helsinki. These lines tend to use the fastest possible way to get out of Helsinki, usually through motorways.

Lines from southern Espoo terminate at Kampin keskus, the ones from central Espoo and western Vantaa terminate at Elielinaukio and the ones from northern Vantaa and Kerava terminate at Rautatientori. The last two mentioned are located next to the central railway station.

The operating hours for regional lines are similar to those of internal lines, but the departures are often not as frequent.

At most times, the line numbers are composed of three digits and occasionally a letter or two accompanying them. Two-number regional lines are rare, and thus far only two have been created: 39 Kamppi-Myyrmäki and 74 Hakaniemi-Porttipuisto (IKEA).

Tram

A modern Variotram on Line 7

Helsinki's tram network has been operated continuously with electric drive since 1900 and it is mostly of a traditional type, with all of the tramways located on the streets, on both dedicated tram lanes and in mixed traffic. The network covers the densely populated central districts and some of the adjacent areas, but it has been expanded only very modestly after the 1950s. The network is composed of 12 lines, all of which except one (line 8) run through some part of the city centre. Over 50 million trips are made with the trams each year.

The tram system is managed and operated by HKL.

Metro

Interior of a Series 200 Metro

The metro is the backbone for traffic east and west of central Helsinki. The system consists of two lines, M1 and M2, with a total of 25 stations. The metro is managed and operated by HKL.

Commuter Rail

Stadler Flirt Commuter Train, Helsiki

The commuter rail system is the backbone for the areas northeast and northwest from downtown. The network reaches relatively far from Helsinki with metro-like services from Helsinki to Kerava, Kirkkonummi and the Helsinki Airport. The network is managed by HSL and operated by VR. Trains not managed by HSL reach even further, to Lahti, Riihimäki and Karis.

Ferry

M/S Suomenlinna II

Helsinki has two ferry lines, both operated by Suomenlinnan Liikenne Oy. One ferry connects Suomenlinna to the mainland. The ferries are the only connection to the mainland for the residents of Suomenlinna, though a tunnel for emergency vehicle access is in place. The second line connects the mainland to the Korkeasaari Zoo. One line departs from Market Square and the other from Katajanokka.

City Bikes

Helsinki's city bike system was opened in May 2016 with 50 city bike stations and 500 bikes serving the inner city area. The system was expanded in 2017 to cover an additional 100 stations and 1000 bikes.

Tickets

Zones

The public transportation system has three zones: internal, regional (two zones) and the whole region (three zones). Internal covers a single city and regional the Helsinki metropolitan area or the whole area without Helsinki. The whole region covers the Helsinki metropolitan area and additionally the Kerava, Kirkkonummi and Sipoo municipalities. The different areas are symbolised by different colours: Blue signifies Helsinki, green signifies Espoo and Kauniainen, red signifies Vantaa and purple signifies the entire metropolitan area.

Ticket Types

The transport system offers a vast number of different tickets and several ways to get them.

Single fare tickets can be bought from bus drivers, ticket machines, by mobile app or by text message. Text message tickets are only valid on the metro and its feeder lines, trams, commuter trains within Helsinki, the ferry to Suomenlinna, and Helsinki bus 78.[1] Each metro station and ferry stop, and most railway stations, are equipped with at least one ticket machine.

Most users of the public transport have a Travel Card, an RFID card used as an electronic ticket. Users can load period and value on their cards. Period ticket offers unlimited travel for the dates paid for. Value is used to pay for one trip, which may contain changes. The price of a single trip is lower when paid with the travel card instead of buying a single fare ticket.

Internal single trip tickets are valid for one hour (for the eastern and north eastern feeder lines 80 minutes). For regional tickets the transfer time is 80 minutes or 100 minutes for the ticket covering the whole region.

Fare Collection

On buses, the driver checks tickets as passengers board. The metro, local trains, trams, and ferries use a proof-of-payment system: fare inspectors check tickets on randomly selected vehicles, and charge a fine of €80 and the price of a single ticket to those who do not have one.If a passenger has forgotten his/her Travel Card with valid travel period, the passenger may later visit a service point of the transport company and will not have to pay the fine.

New Siemens Metros for Bangkok Skytrain System; Thailand

11 Apr. 2019 | Josephine Cordero Sapién

- Rolling Stock

Thailand – In August 2018 Siemens Mobility and consortium partner Bozankaya (Turkey) delivered metro trains to Bangkok. The first seven of these metros have

now started running on the Bangkok Skytrain (BST), including the the Sukhumvit Line extension.

© www.siemens.com/press

This latest extension to the system opened in December 2018. This 25km extension connects Samut Prakan to the south of the city with Bangkok. The elevated section of the line, meanwhile, begins in Bearing and runs for 13km. The Bangkok Mass Transit System Public Company (BTSC) will now deploy them into full service on the Sukhumvit (Green) Line between Mo Chit Station to Samut Prakan Station.

Related Post: Skoda Delivers Last of 250 ForCity Alfa Praha Trams to Prague

New Siemens Metros for the Bangkok Skytrain © www.siemens.com/press

The Siemens-Bozankaya Consortium Contract & Breakdown

Overall, the Siemens-Bozankaya consortium will supply 22 four-car trains. The consortium won the contract in May 2016. Siemens Mobility's contribution comprises the bogies, drive and brake systems and auxiliary services. Siemens Mobility is also responsible for project management, engineering, design and the metros' commissioning.

The manufacturing facility for these metro trains will be the Bozankaya plant in Turkey's capital, Ankara. The consortium intends to deliver all 22 metro trains by the end of the year. Siemens Mobility meanwhile will service and maintain the trains for 16 years.

As part of the 2016 contract, Siemens Mobility also has other responsibilities. It will, for example, supply the traction power for the Green Line's extension.

Sabrina Soussan, CEO of Siemens Mobility, said:

"The Skytrain is a very special success story for us: It's the first public rail transport system in the Thai capital and Siemens Mobility delivered the elevated system as a turnkey project. We've provided full service for the system since its commissioning nearly 20 years ago and will continue to do so until 2029, ensuring that over 99 percent of the existing trains are available daily. With the addition of our new trains, capacity on the Green Line will increase to over one million passengers a day. At the same time, they offer users optimal passenger comfort and convenience."

Siemens Metro Order Background for the Bangkok Skytrain

Siemens Mobility provided the first metro trains for the skytrain system when it opened in 1999. These metros were three-car trains. In 2010 then the BTSC ordered new cars to extend the existing three-car fleet into four-car trains. This current order for 22 new trains is Siemens Mobility's third rolling stock order with BTSC.

Read more about Bangkok Transit:

- Bangkok Skytrain: Bombardier Discloses Maintenance Contract Partner
- Siemens to Deliver Fully Automated People Movers for Bangkok

Electric Bus planning joint Venture formed; Germany

15 Apr. 2019

BUSES: Transport software company IVU Traffic Technologies and Aachen-based consultancy Ebusplan have formed a joint venture to develop software and components for battery electric buses.

Based in Aachen, EBS Ebus Solutions aims to develop rostering tools tailored to the needs of electric bus fleets. The joint venture partners expect demand for this to grow as transport operators increase the number of electric buses that they operate.

'The electric bus market requires specific solutions and a completely new approach', said IVU CTO Matthias Rust, who becomes the Managing Director of Ebus Solutions.

The software being developed aims to enable a consistent planning process across five fields: strategic planning, vehicle scheduling, charging phase planning, depot management and vehicle dispatch.

'We want to think about electromobility systematically', said Ebusplan Managing Director Philipp Sinhuber. 'This means that we have to get rid of outdated customs and develop systems that cover and enhance all deployment of electric buses with innovative approaches, independently of the specifications of existing planning tools.'

Related news

- 08 Mar 2019 - Strategic partnership to develop integrated transport IT
- 16 Nov 2017 - Hannover transport operator signs IT development agreement

Strategic Partnership to develop Integrated Transport IT; Germany

08 Mar. 2019

GERMANY: Daimler Buses has announced a strategic partnership with technology company IVU Traffic Technologies to develop 'integrated mobility solutions for the public transport of tomorrow'.

As part of this, Daimler Buses has acquired a 5·25% stake in Berlin-based IVU from the Gerlind & Ernst Denert-Stiftung foundation established by IVU's previous CEO, Ernst Denert.

Announcing the partnership on February 27, Daimler Buses said public transport was undergoing a 'radical transformation'. The company had identified increased connectivity, electric power and digital services as three factors that it expects will have a significant impact going 'far beyond the vehicle itself and the traditional IT transport system'.

'Through the co-operation with IVU, we are positioning ourselves even stronger as an integrated system provider for public transport', said Till Oberwörder, Head of Daimler Buses and Chief Executive of EvoBus.

IVU CEO Martin Müller-Elschner said the IVU.suite was one of the leading resource planning and fleet management platforms. He anticipated that the partnership with Daimler

Buses would create synergies for development and strengthen the company's position in the international market.

Related news

- 15 Apr 2019 - Electric bus planning joint venture formed

Mercedes-Benz electric Buses Ordered for Wiesbaden; Germany

11 Apr. 2019

GERMANY: Wiesbaden transport operator ESWE Verkehrsgesellschaft has ordered 56 Mercedes-Benz eCitaro battery electric buses. The contract announced on April 10 includes the supply of chargers and other depot infrastructure.

The first 10 buses are due to arrive this year, with the remainder following in 2020. The first 15 will be equipped with lithium-nickel-manganese-cobalt-oxide batteries. Each bus will have 12 battery packs, giving a total capacity of 292 kWh. The remaining 41 will be equipped with solid-state batteries, with seven battery packs offering 441 kWh.

The batteries will be charged using plug-in charging at the depot. IVU Traffic Technologies will work with Mercedes-Benz to supply charging management. Each bus will be assigned a defined charging point upon arrival at the depot, and the smart charging software will optimise the amount of charging needed. Charging management will also preconditioning the temperature of the passenger compartment and batteries.

According to the manufacturer, the buses will have a range of up to 200 km between charges. Vehicle maintenance will be carried out in co-operation with Taunus Auto Verkauf.

Related news

- 04 Apr 2019 - Hamburg-Holstein becomes next eCitaro customer
- 28 Mar 2019 - Berlin takes eCitaro delivery
- 08 Jan 2019 - RNV takes delivery of Mercedes-Benz eCitaro buses

BYD launches 'longest Electric Bus'; China

15 Apr. 2019

CHINA: Bus, car and battery manufacturer BYD has launched what it claims is the longest pure battery electric bus in the world at its headquarters in Shenzhen.

The three-section aluminium alloy bodied K12A is 27 m long and has capacity for 250 passengers. It has a maximum speed of 70 km/h and can be operated using a two-wheel drive or distributed four-wheel drive mode.

The bus is equipped with AC and DC charging ports, and the batteries give a range of 'almost 300 km', according to the manufacturer. BYD says that the bus can save up to

Related news
14 Oct 2016 - BYD enters urban rail market

BYD enters Urban Rail Market; China

14 Oct. 2016

Photo: Xinhua

CHINA: Bus, car and battery manufacturer BYD unveiled its first monorail at a 4·4 km test track at its headquarters in Shenzhen on October 13.

SkyRail is the result of a five-year 5bn yuan R&D project and is aimed at small and medium sized cities, as well as tourist attractions and central business districts. It offers a capacity of up to 30 000 passengers/h per direction and a maximum speed of 80 km/h.

'As a rail transport option with relatively small passenger capacity, SkyRail can complement existing public transport systems to create a layered transport system encompassing underground, roadway and elevated elements', said BYD President Wang Chuanfu.

The first customer for SkyRail is the city of Shantou in Guangdong province, where a 250 km network is planned.

Harbin Metro Line 1 extended; China

12 Apr. 2019

CHINA: An 8·6 km extension of Harbin metro Line 1 opened on April 10. The extension from Hananzhan (Harbin South railway station) to Xinjiang Street is entirely underground and adds four stations. One more station is scheduled to open at a later date.

The initial section of Line 1 opened in September 2013 between Harbin South and Harbin East railway stations. The extension brings the north-south route to 26·1 km with 22 stations. Services are operated with a fleet of 17 six-car Type B trainsets supplied by CNR Changchun.

The city's second metro line opened in January 2017. Extensions of Line 3 are planned to open in 2021 and 2023. Line 2 is under construction for opening in 2020, and two further metro lines are scheduled to open after 2025.

METRO NEWSLETTERS
on
URBAN MOBILITY AS A SERVICE

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

TRANSPORTATION AND ECONOMIC DEVELOPMENTS IN MODERN URBAN/MEGAPOLIS ENVIROMENT

METRO Newsletter by Dr. F.A. Wingler
METRO 59, April 2019

Elevated Cantilever Construction over Railway Line at Ernakulum for Kochi Metro

PART I: ACTIVITIES FOR URBAN MOBILITY AS A SERVICE IN INDIA

POTENTIAL USE OF ARTIFICIAL INTELLIGENCE FOR RAILWAY AND METROS IN INDIA

In the modern day, computers, electronic gadgets internet, Wi-Fi, online services, social media, e-learning and alike have attained immense popularity. Almost everyone is glued to the screens of their smartphones, tabs, and laptops; either studying, playing games, connecting with friends on social media or busy in some work. Gadgets and quick learning have become part of our day-to-day lives. Addition to this is the machine learning that has been incorporated in various spheres. Machine learning plays a prominent role in simplifying the tasks that are humanly impossible or time-consuming. The ***Artificial Intelligence*** *(AI) system gives Predictive measures.*

What is Artificial intelligence?

Artificial intelligence is the study where computers are made to think the way human brains work. For example, if the user searches on the web, the advertisers follow the user on every connected social media accounts or web page that they scroll. Ever witnessed this while working on various platforms in the World of machine learning? If yes, then this is Artificial intelligence.

Utilization of Artificial Intelligence in Railways:

As **Indian railways** is the fourth largest network in the World, managing railways have always been a tough task for the management and Indian Government; as it needed some assistance in the operations. The introduction of Artificial Intelligence has been an elixir to the railways and the passengers using the services of railways. Artificial Intelligence has provided relief in operational delays and innovations in the customer experience and service delivery. Many **Original Equipment Manufacturers** (OEMs) are now investing significant resources into one of the most valuable and potentially rewarding currencies in business: big data.

Condition Based Management vs Predictive Management:

Railways have various things that needed keen observation and maintenance; like rolling stock maintenance, big data is synonymous with **Condition Based Management** (CBM) and Predictive Management (PM).

Rapidly expanding scale of manufacturing and asset management industry is the reason why adapting to the wider applications of advanced algorithms have become essential. Operations such as collecting real-time data about the location and performance of the asset with the help of geospatial orientation and spanning last minute, hour, day, week and beyond. The discrepancies occurring at the time of movement of trains, analysis of root causes of the failures caused by system dis-functioning can be detected and repaired timely.

AI is the future:

Application in Signalling is a field that the AI can be utilized and is being assessed . The signalling system has witnessed a marvellous change in auditing of trains that have suffered breakdowns or damages due to train collisions root cause being fault in track clearance and movement. The delays in signalling of trains have been reduced; which in turn have assisted in decreasing the delays in arrival and departure of trains.

As a result, comprehensive supervision is possible and

auditing of root causes due to failure in systems can be rectified at the earliest.

Recently held World's largest religious fest **Ardh Kumbh Mela**, Prayagraj from January 2019 to March 2019, which witnessed around 100 million devotees. Railway deployed machine learning systems to control the crowd of devotees, that is impossible humanly or time consuming.

Artificial Intelligence has marked its success as it managed the crowd in simplified ways connecting the real life instances with technical brains to bring out the best output. Unlike previous Kumbh Melas held in the history , this is considered as one of the best religious event organized in India ever.

Utilization of Artificial Intelligence in Metros:

The process of restructuring the railway, metros and aerospace is known as interlinking the technical brains with human brains.

The first ever metro of India was built in Kolkata, it had its share of pros and cons. It was a relief to daily commuters but the facilities came with some clause. The metros were built on the lines of traditional railway functioning systems.
However, the Delhi Metro was a game changer as it came with all the latest technologies introduced in every department of DMRC (**Delhi Metro Rail Corporation**).

The Delhi metro was able to come with the latest Artificial intelligence amenities on account of the DMRC project being co-funded by renowned Delhi Government and Union Government of India.

Starting from the ticketing system- tokens and smart cards, the provision of vending machines that allows the users to operate the machines get their tickets or tokens and recharge smart cards for their journey inside the DMRC premises. The machine learns what the user wants to do with AI assistance and make the travel easier for them.

The automated systems for opening and closing of the doors of the metro and at the metro platforms are also backed by AI technology.

The geo positioning of DMRC metro trains are making trips minute after minute, delays are curbed. Artificial intelligence has made the process of metro simpler not only for commuters but also for the executives working at DMRC.

Hence, Artifical Intelligence is making its inroads in all industries and the opportunity in Railways is huge !

2019

METRO PROJECTS IN INDIA - UPDATES

OPERATIONAL METRO: Ahmedabad Metro | Bangalore Metro | Chennai Metro | Delhi Metro | Gurgaon Metro | Hyderabad Metro | Jaipur Metro | Kolkata Metro | Kochi Metro | Lucknow Metro | Mumbai Metro | Nagpur Metro | Noida Metro

UNDER CONSTRUCTION METRO: Agra Metro | Bhopal Metro | Indore Metro Kanpur Metro | Meerut Metro | Navi Mumbai Metro | Patna Metro Pune Metro

UNDER PLANING METRO: Guwahati Metro | Gwalior Metro Kozhikode Light Metro | Ludhiana Metro | Srinagar Metro | Surat Metro Thiruvananthapuram Light Metro | Uttarakhand Metro | Vijayawada Metro Visakhapatnam Metro | Varanasi Metro

www.railanalysis.com

OPERATIONAL PROJECTS :

AHMEDABAD METRO

Project Description :

Transit type : Ahmedabad Metro
Number of lines : 2
Number of stations : 32
System length : 40.03 km
Track gauge : Standard Gauge
Average speed : 33 km/h
Top speed : 80 km/h

Latest Updates 2019 - 20

Mar 05, 2019 :	Hon'ble Prime Minister of India, Shri Narendra Modi dedicated Ahmedabad Metro Rail Project Phase-1 to the Nation
Feb 26, 2019 :	Metro tunnel from Apparel Park to Kalupur ready
Feb 20, 2019 :	Cabinet approves Ahmedabad Metro Rail Project Phase-2

BANGALORE METRO

Project Description :

Operator : Bangalore Metro Rail Corporation Ltd. (BMRCL)
Operation Start Date: 20 October 2011
Transit type : Rapid transit
Number of stations : 40
Operational System length : 42.3 km
Number of lines : 2 East-west corridor (Purple Line), North-south corridor (Green Line)

Latest Updates 2019 - 20

Mar 19, 2019:	Bangalore Metro gets 44 acres of forest land from Central government
Mar 04, 2019:	Track-laying work was in progress for the extended metro line from Yelachenahalli to Anjanapura under Phase 2
Dec 21, 2018 :	Upcoming underground stations of Bangalore Metro Rail to have Platform Screen Doors

CHENNAI METRO

Project Description :

Operator : Chennai Metro Rail Limited (CMRL)
Operation Start Date: 29 June 2015
Transit type : Rapid transit
Number of stations : 32 operational
System length : 45 km (operational) ; 54.1 km (Phase I and Extension)
Number of lines : 2 (Blue and Green Line)

Latest Updates 2019 - 20

Mar 18, 2019 :	32 Metro Stations awarded with IGBC Platinum Rating
Feb 12, 2019 :	Tamil Nadu Chief Minister seeks Centre's sanction for Chennai Metro phase-2
Feb 11, 2019 :	Rs 2,681 crore allocated for Chennai Metro Rail project

DELHI METRO

Project Description :

Operator : Delhi Metro Rail Corporation Limited (DMRCL)
Operation Start Date: 24 December 2002
Transit type : Rapid transit / Metro
Number of stations : 236, includings 6 Airport Express
System length : 327 Km
Number of lines : 8 colour Lines (Red, Yellow, Blue, Green, Violet, Orange, Pink and Magenta)

Latest Updates 2019 - 20

Mar 25, 2019 :	Uber, Ola to install kiosks at more Metro stations
Mar 18, 2019 :	Delhi Metro to conduct customer satisfaction survey from Mar 18 to Apr 14
Mar 11, 2019 :	300 Metre Pathway opened for switching between Noida Metro Aqua Line and Delhi Metro Blue Line

GURGAON METRO

Project Description :

Operator : Rapid Metro Gurgaon Ltd. (RMGL)**Operation Start Date:** 14 November 2013
Transit type : Rapid transit
Number of stations : 11
System length : 11.7 km
Number of lines : 1
No. of tracks : 2

Latest Updates 2018 - 20

Feb 04, 2019:	DMRC to take over operations of Gurgaon Rapid Metro from Feb 5
Feb 04, 2018:	Introduce Dual Chip Pre-Paid Metro Wallet And Non-Transit Wallet By End-2018
Feb 04, 2018:	Gurgaon Metro Records Punctuality Of 99.88%, Availability Of 99.94%

HYDERABAD METRO

Project Description :

Operator : Hyderabad Metro Rail Ltd. (HMRL)
Operation Start Date: 29 November 2017
Transit type : Rapid transit
Number of stations : 40
System length : 46.5 Km
Number of lines : 2 (Operational) ; 3 (Phase I)
No. of tracks : 2

Latest Updates 2019 - 20

Mar 27, 2019 :	Hyderabad Metro Rail patronage reaches 2.20 lakh
Mar 20, 2019 :	Ameerpet to Hi-Tec City Metro Rail stretch flagged off
Mar 16, 2019 :	CMRS approves Ameerpet-Hitech city route

JAIPUR METRO

Project Description :

Owner : Jaipur Metro Rail Corporation Limited (JMRCL)
Operation Start Date: 3 June 2015
Transit type : Rapid transit
Number of stations : 9 (operational); 22 additional stations (planned)
System length : 9.63 km (operational); 23 km (planned)
Number of lines : 1 (operational); 1 (planned)

Latest Updates 2019 - 20

Mar 23, 2019 :	Jaipur Metro rail to be extended to Ramganj
Jan 08, 2019 :	Jaipur Metro Rail begins operations through Automatic Train Operation (ATO)
Sep 26, 2018 :	An internal trial run of Metro on Phase-1B conducted

KOCHI METRO

Project Description :

Operator : Kochi Metro Rail Ltd. (KMRL)
Operation Start Date: 03 October 2017
Transit type : Rapid transit
Number of stations : 16
System length : 18.4 km
Number of lines : 3 (1 Operational/under construction, 1 Approved, 1 planned

Latest Updates 2019 - 20

Mar 22, 2019 :	Kochi Metro achieves 2 Crore travellers mark
Feb 23, 2019 :	Land acquisition for Kochi Metro extension gets a boost
Dec 21, 2018 :	Construction of iconic cantilever bridge at Ernakulam South completed

KOLKATA METRO

Project Description :

Operation Start Date : 24 October 1984
Transit type : Rapid transit
Number of stations : 24 Stations (Line 1/ North South Metro)
12 Stations (Line 2/ East West Metro)
12 Stations (Line 3/ Joka - B.B.D. Bagh)
9 Stations (Line 4/Noapara - Barasat)
11 Stations (Line 5/ Baranagar - Barrackpore)
23 Stations (Line 6/ Airport - New Garia)

Latest Updates 2019 - 20

Mar 05, 2019 :	Kolkata Metro's 1st Metro Rake from Overseas arrived in the city
Jan 12, 2019 :	State government allows to resume work on Joka-Esplanade Metro stretch
Dec 08, 2018 :	Railway Board gives nod to begin construction on Airport-Barasat Metro line

LUCKNOW METRO

Project Description :

Operator : Lucknow Metro Rail Corporation (LMRC)
Operation Start Date: September 05, 2017
Transit type : Rapid transit
Number of stations : 8
System length : 8.5 km
Number of lines : 1 (Operational) 1 (Approved) 6+ (Planned)

Latest Updates 2019 - 20

Mar 07, 2019:	Prime Minister Narendra Modi flags off Lucknow Metro's commercial run on the 23-km North-South corridor
Feb 25, 2019:	CMRS Gives Certification To Lucknow Metro Rail Corporation After 3 Day Successful Inspection From CCS Airport To Munshipulia
Feb 19, 2019:	Lucknow Metro Obtains Fire Safety Clearance For All The 13 Metro Stations Of The Balance Section Of The North-South Corridor (Phase-1a)

MUMBAI METRO

Project Description :

Owner : MMRDA, Mumbai Metro One
Operation Start Date: 8 June 2014
Transit type : Rapid transit
Number of stations : 12
System length : 11.4 Km

Latest Updates 2019 - 20

Mar 19, 2019:	Mumbai Metro One launches 2-in-1 travel smart card
Mar 15, 2019:	MMRDA plans Transit Oriented Development (TOD) along Mumbai Metro corridors
Mar 06, 2019:	MMRDA floats tenders for Construction of Metro Bhavan in Aarey

NAGPUR METRO

Project Description :

Transit type : Nagpur Metro
Number of lines : 2
Number of stations: 42
System length : 43 km
Operator : Maharashtra Metro Rail Corporation Limited (MAHA-METRO)

Latest Updates 2019 - 20

Mar 07, 2019 :	Prime Minister Shri Narendra Modi flags off the first phase of Nagpur Metro
Feb 23, 2019 :	MahaMetro Announces Inaugural Fare Structure
Feb 19, 2019 :	RDSO conducts a trial run from Khapri to Congress Nagar Metro stations

www.railanalysis.in

UNDER - CONSTRUCTION PROJECTS :

NOIDA METRO

Project Description :

Owner : Noida Metro Rail Corporation (NMRC)
Transit type : Rapid transit
Number of lines : 1
Number of stations : 21
Operation will start : December 2018
System length : 29.7 km
Track gauge : 1,435 mm Standard Gauge

Latest Updates 2019 - 20

Mar 27, 2019:	6.45 lakh people used Aqua Line in 2 months
Feb 28, 2019:	Over 3.24 lakh passengers took rides on the Noida-Greater Noida Metro in the first month
Jan 30, 2019:	Over 37,000 passengers avail rides on Noida-Greater Noida Metro in first 3 days

AGRA METRO

Project Description :

Project Name : Agra Metro
Owner : Uttar Pradesh Metro Rail Corporation
Transit type : Rapid transit
Number of lines : 2
Number of stations : 27
System length : 30 km (Phase 1)

Latest Updates 2019 - 20

Mar 08, 2019 :	PM Modi laid foundation stone for Agra Metro Rail Project
Feb 28, 2019 :	The Union Cabinet, chaired by the Prime Minister Narendra Modi has approved Agra Metro Rail Project having two corridors.
Feb 11, 2019 :	State government allocates Rs 175 crore for Metro rail project in Agra

BHOPAL METRO

Project Description :

Project Name : Bhopal Metro
Operator: Madhya Pradesh Metro Rail Co Ltd.
Transit type : Light metro
Number of Corridors : 3 (planned)
Number of stations : 86 (planned)
Track gauge : Standard gauge
System length : 198.95 km (planned)

Latest Updates 2019 - 20

Dec 19, 2018 :	Excavation Work Begins for Metro Rail project in city
Sep 25, 2018 :	State Cabinet Clears Proposal for 500 Million Euros Loan from European Investment Bank (EIB) for Bhopal Metro Project
Aug 21, 2018 :	Dilip Buildcon Bags Rs 247.06 Crore Contract for Bhopal Metro Rail Project, Phase-1

INDORE METRO

Project Description :

Project Name : Indore Metro
Operator : Madhya Pradesh Metro Rail Co Ltd
Transit type : Light metro
Number of lines : 5 (estimated) , 5 (planned)
System length : 94 km (estimated)
Number of stations : 89 (estimated)
Track gauge : Standard Gauge

Latest Updates 2019 - 20

Oct 05, 2018 :	Dilip Buildcon Receives LoA for Bhopal and Indore Metro Rail Project Valued at 476.02 Crore
Sep 21, 2018 :	Dilip Buildcon Declared Lowest Bidder for Indore Metro Rail project, Phase-I
Jul 17, 2018 :	Tender Invited For Construction of Elevated Viaduct & Stations Between ISBT/MR10 Flyover and Mumtaj Bag Colony

KANPUR METRO

Project Description :

Transit type : Kanpur Metro
Number of lines : 2
Number of stations: 42
System length : 43 km
Operator : Maharashtra Metro Rail Corporation Limited (MAHA-METRO)

Latest Updates 2019 - 20

Mar 18, 2019:	Metro rail to promote Transit Oriented Development
Mar 01, 2019:	Metro Projects in Agra and Kanpur approved by Centre
Feb 12, 2019:	Public Investment Board approves Metro rail projects in Patna, Agra, Kanpur

MEERUT METRO

Project Description :

Project Name : Meerut Metro
Transit type : Rapid transit
Number of lines : 2 (Phase 1)
Number of stations : 29 (Planned)
System length : 35 km
Track gauge : Standard gauge
Average speed : 65 km/h
Top speed : 80 km/h

Latest Updates 2019 - 20

Mar 09, 2019 :	Prime Minister Narendra Modi laid the foundation stone for Meerut Metro Service at Sikandarpur in Ghaziabad.
Feb 19, 2019 :	Union cabinet approves India's first regional rail along with metro in Meerut
Sep 06, 2018 :	State Government Sends DPR for Starting Metro Rail in Kanpur, Agra and Meerut to Centre

NAVI MUMBAI METRO

Project Description :

Owner : City and Industrial Development Corporation (CIDCO)
Transit type : Rapid transit
Number of lines : 1
Number of stations : 20
Operation will start : May 2019
System length : 23.40 km (14.54 mi)
Track gauge : Standard gauge

Latest Updates 2019 - 20

Mar 13, 2019:	Two trains for Navi Mumbai Metro reaches Mumbai port
Feb 27, 2019:	CIDCO approved DPR for lines 2 and 3 under the Navi Mumbai Metro Project
Feb 18, 2019:	Work to install the 130-metre truss for the Navi Mumbai Metro over the Panvel-Diva railway line was completed

PATNA METRO

Project Description :

Transit type : Rapid Transit
Number of lines : 2
Number of stations : 23 (planned)
System length : 33 km (planned)
Track gauge : 1,435 mm

Latest Updates 2019 - 20

Feb 18, 2019 :	Prime Minister Narendra Modi lays foundation stone of Patna Metro Rail Project
Feb 14, 2019:	Union Cabinet approves Patna Metro Rail Project at Rs. 13365.7 crore
Feb 08, 2019:	Patna Metro project gets the Public Investment Board's (PIB) nod

UNDER - PLANNING PROJECTS :

PUNE METRO

Project Description :

Project Name : Pune Metro
Operator : Maharashtra Metro Rail Corporation Limited (MAHA-METRO)
Transit type : Rapid Transit
System length : 31.25 km
Number of stations : 30
Track gauge : Standard Gauge

Latest Updates 2019 - 20

Mar 18, 2019 :	PuneMetro work for Reach1 PCMC - Range Hill is in progress at Harris Bridge.
Mar 16, 2019 :	Civil work has started for the first foundation in Mula Mutha river, near Bund Garden for Pune Metro Reach3 Civil Court to Ramwadi.
Mar 16, 2018 :	Four Launching Girders are operational for Reach1 PCMC-Range Hill to achieve proposed timeline of Pune Metro

GUWAHATI METRO

Project Description :

Operator : Guwahati Metro Rail Corporation Limited (GMRC).
Transit type : Rapid Transit Number of lines : 4 (Phase 1)
Number of stations : 54
System length : 61.4 kilometres (planned) Detailed
Project Report: RITES

Project Details :

The Guwahati Metro is a mass rapid transit system proposed for the city of Guwahati, Assam.

Stage In Project
Planning

Project Cost
Estimated Cost for the project is Rs 18,020 Crore.

GWALIOR METRO

Project Description :

Transit type : Rapid transit
Operator : Madhya Pradesh Metro Rail Company Limited.
Number of lines : 3 (Proposed)
Number of stations : 100 (Projected) System length : 105 Km
Detailed Project Report: RITES

Project Details :

Greater Gwalior Metro Rail is a proposed rapid transit system for the city of Gwalior, Madhya Pradesh in India. The project was announced by state Chief Minister Shivraj Singh Chauhan on October 17, 2014.

The survey has been started.

Stage In Project
Planning

KOZHIKODE LIGHT METRO

Project Description :

Transit type : Light Metro Rail System
Number of lines : 1 (Phase I)
Number of stations : 22 (Phase I)
System length: 44 km (Phase I)
Track gauge : 1,435 mm standard gauge
Operator : Kerala Rapid Transit Corporation Limited

Project Details :

Kozhikode Light Metro is a proposed mass rapid transport system (MRTS) for the city of Kozhikode (Calicut), in India.

Stage In Project
Planning

Project Cost
Around Rs 2500 crore.

LUDHIANA METRO

Project Description :

Operator : Ludhiana Metro Rail Corporation Transit
type : Rapid transit
Number of lines : 2 (Phase 1)
Number of stations : 27
Operation will start : Postponed
System length : 28.83 kilometres (planned) Track **gauge :** 1,435 mm Standard Gauge

Project Details :

Ludhiana Metro is a proposed rapid transit system for the city of Ludhiana, Punjab. This project is under Public-Private Partnership (PPP) or Build Operate Transfer (BOT) model.

Stage In Project
Planning

Project Cost
Rs 10,300 crore

SRINAGAR METRO

Project Description :

Owner : Srinagar Development Authority Transit
type : Rapid transit
Number of lines : 2
Number of Stations : 18 (estimated)
System length : 54 km

Project Details :

The Srinagar Metro is a rapid transit proposed for the city of Srinagar capital of Jammu and Kashmir, in India.

Stage In Project
Planning

Project Cost
Estimated Cost for the project is Rs 15881 Crore.

SURAT METRO

Project Description :

Nodal Agency till SPV is formed : Gujarat Metro Rail Corporation Limited
Locale : Surat, Gujarat
Transit type : Rapid transit
Number of lines : 2
Number of stations : 37
System length : 40.35 km

Project Details :

Surat Metro is a rapid transit rail system for the city of Surat, Gujrat, India.

Stage In Project
Planning

Project Cost
Rs 12,800 crores

THIRUVANANTHAPURAM LIGHT METRO

Project Description :

Operator: Kerala Rapid Transit Corp. Ltd. Transit
Type : Light Metro Rail System
Number of lines : 1
Number of stations : 19
System length : 22.20 km
Average speed : 40 km/h

Project Details :

Thiruvananthapuram Light Metro Rail is a proposed Metro rail system in the city of Thiruvananthapuram, the capital of the Indian state of Kerala.

Stage In Project
Planning

Project Cost
Rs 4,219 crore (Estimated)

UTTARAKHAND METRO

Project Description :

Transit type : Rapid Transit System
Locale : Dehradun, Uttarakhand, India System
Length: 70 km
Phases: 2

Project Details :

Uttarakhand Metro is a Rapid Transit System. This Project will connect to Dehradun, Rishikesh and Haridwar

Stage In Project
Planning

Detailed Project Report
DMRC

VIJAYAWADA METRO

Project Description :

Operator : Amaravati Metro Rail Corporation (AMRC)
Transit type : Rapid transit
Number of lines : 3 (planned)
Number of stations : 25
System length : 40 km
Track gauge : 1,435 mm Standard Gauge

Project Details :

The Vijayawada Metro Rail is a proposed rapid transit system for the city of Vijayawada in Andhra Pradesh, India.

Stage In Project
Planning

Project Cost
Rs 6,769 crore

VISAKHAPATNAM METRO

Project Description :

Transit type : Rapid transit
Number of lines : 3
Number of stations : 38
Operation will start : 2024 System
length : 42.5 km

Project Details :

Visakhapatnam Metro Rail is a proposed rapid transit system for the city of Visakhapatnam in Andhra Pradesh, India.

VARANASI METRO

Project Description :

Owner : Varanasi Development Authority
Transit type : Rapid transit
Number of lines : 2 (proposed)
Number of stations : 26 (proposed)
System length : 29.235 km
Track gauge : 1,435 mm Standard Gauge

Project Details :

The Varanasi Metro is a rapid transit proposed for the city of Va...

Project Description :

Owner : Varanasi Develo
Transit type : Rapid tran
Number of lines : 2 (pro
Number of stations : 26
System length : 29.235 k
Track gauge : 1,435 mm

Project Description :

Transit type : Rapid transit
Number of lines : 3
Number of stations : 38
Operation will start : 2024 System
length : 42.5 km

pment Authority
sit
posed)
(proposed)
m
Standard Gauge

DELHI GOVERNMENT APPROVES MUCH-AWAITED PHASE-IV PROJECT OF DELHI METRO

Image Credit : Wikipedia

The Delhi government on 20 Dec, 2018 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, elevated)
- 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)

www.railanalysis.in

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 an in-principle nod to the Phase-IV project.
- "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.

Phase-4 gets DMRC's board nod :

On 10 Dec 2018, the DMRC (Delhi Metro Rail Corporation) board approved the revised Rs 46,800 crore Phase-4 project.

- The board's re-validation for the project was mandatory as the estimated cost of construction of Phase-4 project has changed twice – from Rs 55,208 crore to Rs 45,603 crore recently but it has now been revised again to around Rs 46,800 crore.
- The cost in 2014 was estimated on the earlier tax regime and was reduced by Rs 10,000 by taking taxes as per GST into account.
- It has marginally gone up as the Delhi Metro had earlier failed to factor in the cost of the procurement of metro coaches and laying down tracks on certain stretches.
- The proposed 104km long Phase-4 project has 6 corridors.

Phase-4 by 2025 :

The phase-4 project of the Delhi Metro rail is likely to be commissioned by 2025. These projections are part of the financial viability segment of the DPR (Detailed Project Report) of phase-4 of the metro project prepared by the DMRC (Delhi Metro Rail Corporation).

- DMRC estimates come at a time when Delhi's finance department had expressed its doubt on the proposed corridors qualifying for a high capacity metro even by the year 2031.
- In the report, the DMRC estimated that all the 6 corridors, will see an average daily ridership of 10 lakh in 2025.
- The proposed 6 corridors of phase-4 are-

1. Janakpuri (west)-RK Ashram (28.92 km)
2. Mukundpur-Maujpur (12.54 km)
3. Rithala-Narela (21.73 km)
4. Tughlakabad-Aerocity (20.20 km)
5. Inderlok-Indraprastha (12.58 km)
6. Lajpat Nagar-Saket G-block (7.96 km)

- 'Financing Options, Fare Structure and Financial Viability' segment of the report pegs daily ridership of the metro at 15.50 lakh by the year 2031 and 22.32 lakh by 2041.

Fare :

- DMRC has estimated the fare slabs to range between Rs 20 and Rs 100, according to the report.

Fare in INR	Travel Distance
20	0-2 km
30	2-5 km
50	5-12 km
60	12-21 km
80	21-32 km
100	above 32 km

www.railanalysis.in

About Delhi Metro :

The Delhi Metro, which began its journey with a mere 8 km long Red Line connecting Shahdara and Tis Hazari, turns 16 on December 25, 2018. It was on December 25, 2002, 16 years ago, when the Delhi Metro was inaugurated by the then Prime Minister Late Atal Bihari Vajpayee, along with then Chief Minister Sheila Dikshit.

- The metro has gone strength to strength since then and will soon boast of being one of the largest metro rail networks in the world, after Shanghai and Beijing, and is expected to even overshadow the London Underground.
- During its construction in 3 phases, the metro has spread its network across 317 km of the city and its suburbs.
- By the time the Phase-3 winds up next year, it will have expanded to 349 km, and with Phase-IV, which has just been given the green signal and is expected to be completed by 2022, the Delhi Metro will cross the 400 km mark.
- In words of the DMRC (Delhi Metro Rail Corporation), the current year was 'historic' in terms of construction of several new stretches, totalling a length of a "record" 87 km.
- Currently, the metro has 8 color-coded lines: Red, Yellow, Blue, Violet, Orange, Green, Magenta and Pink.
- The Magenta and Pink lines being the latest addition to the fleet.
- The phase-IV, still to go on floor, is no less ambitious and aims to touch some of the harder to reach outskirts of the city, like Bawana and Narela in northwest Delhi.
- With 231 stations over and below ground across the network, the Delhi Metro ferries approx 26-27 lakh riders every day.

Presently, the Delhi Metro network consists of about 317 Km with 231 stations. The network has now crossed the boundaries of Delhi to reach NOIDA and Ghaziabad in Uttar Pradesh, Gurgaon, Faridabad, Bahadurgarh and Ballabhgarh in Haryana.

With the opening of the Majlis Park to Durgabhai Deshmukh South Campus and Janakpuri West - Botanical Garden Sections, new age trains equipped with the Unattended Train Operation (UTO) technology have been introduced.

These trains operate with the Communication Based Train Control(CBTC) signaling technology which facilitates movement of trains in very short frequencies.

The DMRC today has over 280 train sets of four, six and eight coaches. More than a hundred trains of six coach configuration and over 60 trains of eight coach configuration are currently operational.

All stations of the presently under construction corridors are being constructed as green buildings. In the present phase of Delhi Metro's construction, the DMRC is nearing the completion of 160 km of Metro lines which has woven a web of Metro corridors along the city's Ring Road besides connecting with many other localities in NOIDA, Ghaziabad, Bahadurgarh and Ballabhgarh.

Having constructed a massive network of 317 mm with 231 stations in record time, the DMRC today stands out as a shining example of how a mammoth technically complex infrastructure project can be completed before time and within budgeted cost by a Government agency.

Progress of Delhi Metro in 2018 :

The year 2018 was a historic year for the Delhi Metro Rail Corporation (DMRC). This year, a record, 86.72 km 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.

www.railanalysis.in

28th May: The 24.82 km long Kalkaji Mandir – Janakpuri West Metro corridor was flagged off on 28th May 2018 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 km 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 July: 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 km long Durgabai Deshmukh South Campus – Lajpat Nagar Metro corridor was formally flagged off on 6th August 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 km 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.

EXCAVATION WORK BEGINS FOR METRO RAIL PROJECTS IN MADHYA PRADESH

The excavation work for the metro rail project in Indore has been initiated, according to a report. The excavation work is being carried out at the Gurudev Gupt square at MP Nagar by Dilip Buildcon Ltd as a part of civil works on a 6.22 km metro route from AIIMS to Subhash Nagar underbridge, it said.

Prior to the excavation work at MP Nagar, a major water pipeline supplying Kolar had to be shifted, Dainik Bhaskar reported.

- At present, studies are underway to determine which pipelines, cables and other underground utilities may further have to be shifted in order to make way for pillar construction of the metro, as per the report.
- All along the proposed metro route, sample testing of the soil is also being conducted by the MPMRCL (Madhya Pradesh Metro Rail Co Limited) to determine the degree of excavations required on each portion, it said.
- After soil testing is over, another month will be required for preparing the technical design for the route, after which civil works can begin in later January or early February, Jitendra Gupta, Technical (Director) of the company stated.
- Last year, the EIB (European Investment Bank) had agreed to finance upwards of half of the proposed cost of the project, but the final terms of the loan have not been determined yet.
- If the project proceeds at the planned pace, passengers will be able to experience their first rides on Bhopal Metro by 2022, it said.
- The 27.8 km long Bhopal Metro project is estimated to be built at a cost of around Rs 6962.92 crores.

Project Timeline-

03 Oct, 2018: Cabinet Approves Bhopal Metro Rail Project

The Union Cabinet, chaired by the Prime Minister Shri Narendra Modi had approved implementation of Bhopal Metro Rail Project comprising two corridors of total length 27.87 Km

1. Karond Circle to AIIMS (14.99 Km)
2. Bhadbhada Square to RatnagiriTiraha (12.88 Km) which will connect major public nodes and city cluster areas of Bhopal.
3.
- The length of Karond to AIIMS corridor is 14.99 km, which is mostly elevated and partly underground (at Bhopal Railway Station & Bus Station) and comprises of 16 Stations (14-El.evated and 2-Underground).

4.
- The length of Bhadbhada to RatnagiriTiraha corridor is 12.88 km comprising of 14 stations all elevated.

5.
- The project will provide continuous availability of affordable, reliable, safe, secure and seamless transport system in the urban agglomeration of the city, which will reduce the accidents, pollution, travel time, energy consumption, anti-social incidents as well as regulate urban expansion and land use for sustainable development.

6.
- The estimated cost of the project is Rs. 6941.40 crore and the project will be completed in four years.

Benefits:

The population of 23 lakh of Bhopal agglomeration area is expected to be benefitted by Bhopal Metro Rail Project directly and indirectly. The corridors will be having Multimodal Integration with Railway Stations & BRTS Stations and will

have feeder network of Bus, Intermediate Public Transport (IPT) and Non Motorised Transport (NMT).

The Project will have non-fare box revenue from rental & advertisement as well as Value Capture Financing (VCF) through mechanism of Transit Oriented Development (TOD) and Transfer of Development Rights (TDR).

The residential areas along this Metro Rail corridors shall be immensely benefitted by this project, as the people of these areas will be able to travel on trains from their own neighborhoods to reach different areas of the city conveniently.

Karond to AIIMS corridor will pass through the heart of city and connect densely populated areas with Bus Station, Railway Stations and AIIMS. Bhadbhada to Ratnagiri corridor will connect upcoming Smart City's Area Based Development (ABD) with BFIEL and surrounding industrial areas. TheMetro will provide Eco friendly and sustainable public transport to residents, commuters, industrial workers, visitors and travelers.

Developments :

- A SPV namely Madhya Pradesh Metro Rail Co Ltd. (MPMRCL) has been constituted for implementation of the Project.
- The financing of Bhopal Metro Rail Project will be partly from GoI and GoMP on equal equity basis and partly as loan from European Investment Bank (EIB).
- M/s DB Engineering & Consulting GmbH in consortium with M/s Louis Berger SAS and M/s Geodata Engineering S.p.A has been appointed as General Consultant (GC) for Bhopal Metro Rail Project.
- The tenders for first civil work package have been invited and work will start soon .
- Dilip Buildcon (DBL) on 05 Oct, 2018 announced it had won orders worth Rs 476.02 crore for Bhopal and Indore Metro Rail project.

MUMBAI TO HAVE 275-KM LONG METRO LINE BY 2024 SAYS PM MODI

Image Credit : MMRDA

Mumbai will have a 275-km long metro line by 2024, said Prime Minister Narendra Modi, after laying the foundation stone of two metro rail corridors. In Kalyan, Prime Minister Modi laid the foundation stone of two metro corridors -Thane-Bhiwandi-Kalyan metro and Dahisar-Mira-Bhayander metro.

- While addressing a gathering, PM Modi said "In the coming three years, 35-km long metro line will be added to the existing network. By 2024, Mumbai will have a 275-km long metro line."
- The estimated cost of two metro projects has been pegged to be of more than Rs 33,000 crore.
- The metro project was started for the first time in Mumbai in 2006, but in 8 years, the only 11-km long metro route was made operational, he said.
- He said "After coming to power in 2014, his government decided to increase both the speed and scale of the project."
- Both the projects are being executed by the Mumbai Metropolitan Region Development Authority (MMRDA).
- The corridor will have 17 stations.
- The Rs 8,416-crore, 24.9-km-long Thane-Bhiwandi-Kalyan metro corridor (Metro-5) is expected to carry around 2.29 lakh commuters daily by 2021, with the entire system designed for 6-coach trains.
- The 10.3-km elevated Dahisar-Mira Bhayander corridor (Metro-9) comprising 8 stations, is expected to be completed by 2022, and the cost of the project is estimated at Rs. 6,607 crore.

Foundation stone laid for Mumbai Metro-5, Metro-9 :

Prime Minister Narendra Modi on 18.12.2018 laid the foundation stone for Metro rail projects in Mumbai and Pune in Maharashtra.

The metro projects include the Thane-Bhiwandi-Kalyan stretch (Metro-5), the Dahisar-Mira-Bhayander line (Metro-9) in Mumbai and the 3rd Metro line between Hinjewadi and Shivajinagar in Pune.

- Later the PM proceed to Pune, where he laid the foundation stone for the Pune Metro's 3rd Metro line between Hinjewadi and Shivajinagar, being implemented

www.railanalysis.in

by the PMRDA (Pune Metropolitan Region Development Authority) on a PPP (Public-Private Partnership) basis.

- PM Modi reached Mumbai, where he laid the foundation stone for the Thane-Bhiwandi-Kalyan metro-5 and Dahisar-Mira Bhayander metro-9 at Kalyan in adjoining Thane district.

Metro-5 :

- The 24.9-km long Metro-5 corridor will be built at an estimated cost of Rs 8,416 crore.
- The Metro-5 corridor will have 17 stations.
- It is expected to carry 2.29 lakh commuters daily in 2021.

Metro-9 :

- The 10.3km Metro-9 corridor is to be built at an estimated cost of Rs 6,607 crore.
- The elevated Metro 9 corridor, comprising 8 stations, was expected to be completed by 2022.
- As per the proposal, Metro-9 will be integrated with Metro-7 (Dahisar to Andheri) and Metro-2A (Dahisar -DN Road) along with the proposed Rs 3,600-crore Gaimukh-Shivaji Chowk (Mira Road or Metro-10).
- The tendering process to appoint general consultants and contractors for civil works for Metro 9 is in progress, and is expected to commence from next March.

Metro 2A, 2B and 7 lines to be ready by 2021 :

Dahisar-W to DN Nagar Metro-2A Corridor – 18.5-km – Rs. 6,410 crore

- Will have 17 stations
- Expected Daily Ridership – 4.07 Lakh in 2021

DN Nagar to Mankhurd Metro-2B Corridor – 23.5-km – Rs. 10,986 crore

- Will have 22 stations
- Expected Daily Ridership – 8.09 Lakh in 2021

Andheri-E to Dahisar-E Metro-7 Corridor – 16.5-km – Rs. 6,208 crore

- Will have 16 stations
- Expected Daily Ridership – 4.07 Lakh in 2021

DPR of 3 new Metro lines – Metro 10, 11 and 12 – approved

Maharashtra Chief Minister Devendra Fadnavis, on Nov 21 this year, approved the DPR (Detailed Project Report) of three new Metro lines- 10, 11 and 12.

Metro 10:

- The Metro 10 – Gaimukh-Shivaji Chowk (Mira Road) route is 11.2 km.
- The project cost is Rs 4,476 crore.
- There will be 4 elevated stations.

Metro 11:

- The Wadala-CSMT Mumbai Metro 11 was 11.4 km in length.
- The Project cost was Rs 8739 crore.
- There will be 10 stations (2 elevated and 8 underground).

Metro 12:

- The Kalyan-Dombivali-Taloja Metro 12 will be an extension of Metro 5.
- Its total length will be 20.75 kms.
- The route will be completely elevated.
- Its total cost is Rs 4,132 crore.
- There will be 17 stations on the route.

All these DPRs will be recommended for approval from the state government.

Metro Line-9 and Metro-7A Projects Approved

The Maharashtra cabinet in September this year approved the implementation of two Metro rail projects – Dahisar-Mira Bhayander and Andheri-Chhatrapati Shivaji Maharaj International (CSMI) airport – collectively worth Rs 6,607 crore.

Metro line-9 will be Dahisar-Mira Bhayander route, while Metro-7A will be Andheri-CSMI airport route, an official from the Chief Minister's Office (CMO) said.

- Both the routes are together 13.5 km long.
- The Metro line-9 route will be 10.41 km elevated corridor and will have 11 stations, while the extension of Metro-7 Andheri-CSMI airport (Metro-7A) will be 3.17 km long in which 2.11 km will be underground.

Agency approved for operations and maintenance of Mumbai Metro Lines

Maharashtra Chief Minister Devendra Fadnavis in November this year 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.

Fare of Upcoming Metro Lines in Mumbai to be Same as Existing One

The fare structure of the upcoming metro lines in Mumbai will be same as the one which is in force for the corridor currently in operation, said an official. The fares charged to passengers of the Mumbai Metro One corridor will be extended to the upcoming lines of the rapid transport system, the MMRDA (Mumbai Metropolitan Region Development Authority) had said.

- The 11.4km long Mumbai Metro One, which is city's first metro corridor, operates on the Versova-Andheri-Ghatkopar section and it currently has a fare slab of Rs 10 to 40.
- 2 more metro lines are under different stages of construction.
- "The fare structure of the upcoming metro lines will be same as currently applicable in Metro One line. Fare slab of Rs 10 to 40 is quite justifiable and fare. The fare slab of Rs 10, 20, 30 and 40 are quite reasonable," MMRDA Commissioner R A Rajeev had said.
- Speaking at an event, He had said "I also want to stress out that financial aspect is not going to affect the execution of other big ticket projects anyway."
- The existing metro line has a daily ridership of over 4.5 lakh.
- He said, all the metro lines will surely prove to be a game changer.

MOBILISING PUBLIC TRANSPORT- GLOBAL EXPERTISE, LOCAL PRESENCE

Population growth and urbanisation are driving global demand for transport services. As one of the most efficient modes of transport available, rail provides convenient, fast and reliable mobility. It is also a sustainable solution with low climate and environmental impact that can move a large number of people in a relatively little amount of space.

Who we are

Ramboll provides professional engineering, design and consultancy services for a complete range of rail systems - from long distance rail to urban transport systems, such as metros and light rail. We provide services across the life cycle of rail projects - including inception, evaluation and operation.

What we do

Our technical expertise comprises permanent way, traction power, and overhead catenary systems, interlocking systems, signalling, traffic management, telecoms, and rolling stock. With our extensive capability within railway and urban transport services, we offer planning, design, approval, operational, and commissioning services spanning the whole project cycle, from inception to evaluation upon completion.

Holistic and multidisciplinary planning

As a multidisciplinary consultancy, Ramboll is capable of delivering major complex projects requiring specialist railway expertise in track signalling, electrification as well as more general capability in civil engineering, structural engineering, environmental services, commercial advice and support, IT and project management.

Global Expertise Local presence

We draw on our vast experience from local, national and international projects and can, therefore, deliver internationally competitive and integrated holistic solutions that are tailored to local conditions and fully compliant with international standards.

Our leading expertise in the digitalisation of railways has been instrumental in the design of the world's first and largest nationwide ERTMS system. We have extensive experience in light rail and metro projects across Northern Europe and our broad technical skills encompass everything from capacity analysis, electrification, safety, rolling stock and signalling systems and ERTMS.

www.railanalysis.in

Ramboll's market leading expertise in this area includes the design of the world's first and largest nationwide ERTMS system. Through many signalling and ERTMS projects, Ramboll has established extensive experience with ERTMS, ETCS and GSM-R radio.

EUROPEAN RAIL TRAFFIC MANAGEMENT SYSTEM (ERTMS)

Services

- Track Alignment Design
- High-Speed Track Design
- Smart Signalling System Design. Including ETCS - Level 2 and higher
- Electrification Design
- Design of Buildings and Structures
- Specialised in Design of Immersed Tunnels
- Specialised in Typical Bridges
- Quality Auditing of Projects
- Proof Checking (Validation of Designs)
- Safety Audit
- Smart Mobility designing
- Timetabling and Multi-Train Simulation studies
- Traffic Studies
- Capacity Analysis

For information, please contact-
Krishan Kumar Miglani
Rail Track Expert, Ramboll
Website : KHKM@ramboll.com
Tel no. : +91 9868871155

New Technologies for Signalling in Global Railway Projects; India

April 5, 2019 Articles

These are exciting times in railway signalling, so much better than they were thirty years ago. When I started my signalling career in the early 1990s, signalling for mainline railways had a bad reputation, for three reasons. One, most people in the rail industry considered signalling a “secret society” or “dark art” with its own language and vocabulary that was foreign and nearly impossible to understand for normal non- signalling folks. Two, whenever I travelled by train and the train stopped on the open track and the public address system finally offered an explanation, the claimed reason for stopping had almost inevitably to do with signalling.

By the way, I could bet that in many instances the “signalling problem” was just a regular red signal which protected our train from crashing into another one, which is undoubtedly a good thing. Three, signalling was perceived as the reason why we could not run more trains on these terribly expensive railway lines, thus preventing to make the best use of the railway system and assets.

Making Signalling understandable

So, signalling is “nerdy and weird” and an inhibitor to railway capacity and performance, that’s how I grew up career-wise. And I did not like any of that. I liked signalling though, so I stayed with it despite those prejudices. It took me over 20 years to do something practical about the lack of signalling understanding. My self-developed training courses on the fundamentals of modern signalling technologies such as CBTC and ETCS – I come back to those in a moment – have helped hundreds of rail professionals to improve their understanding of signalling and gain the confidence to talk at eye level with their peers about signalling topics. The trick is not to hide behind cryptic acronyms and convoluted historically-grown signalling principles, but to simplify explanations as long as needed until a halfway intelligent non-signalling person can understand them. This is meant to be my legacy, if there ever is one.

How new are new Signalling Technologies?

But I digressed. Back to the other problem with signalling and the topic of this article. I'm not sure if the "new technologies" in signalling that revolutionise the railways these days are really that new. Automatic train operation, for example, has existed in railways for over fifty years since it was first introduced on the Victoria Line of the London Underground in 1968. And first installations of the Communications-Based Train Control (CBTC) technology with moving-block signalling already existed when I had my signalling woes in the early 1990s. But those CBTC installations were exceptions, and the railways using it were considered by many as the "odd ones out". An elevated skyrail in Toronto? A rubber-wheeled people mover between two airport terminals? A tiny light rail service in London Docklands? Outsiders, not the norm.

What Is really new Here?

So it is not the technology itself which is so new in 2019. CBTC has meanwhile become the de-facto standard for control of high-performance metro railways in far over 100 cities around the world. In China alone there are over fifty cities which have, or are constructing, metro railways.

(Image Credit: Hyderabad Metro) Hyderabad Metro has one of the first CBTC Applications in India.

India is another country where CBTC technology spreads very nicely, and an increasing number of Indian metro lines benefit today from the outstanding capacity and performance offered by modern CBTC.

The other new trend in global signalling is the increasing adoption of what I call 'high performance signalling' to mainline railways. Mainline railways are not just lines for high-speed trains or other long-distance passenger and freight rail services. Mainline railways serve cities as well, and some of those systems such as London Overground or Paris RER have a network which is exclusively in and around major cities. As those cities grow, patronage demands for those railways skyrocket and in most cases the first buffer stop for

higher capacity is the legacy fixed-block signalling system where even all practical attempts to have more and shorter block sections cannot get reliable operational capacity any higher than twenty trains per hour, at rather slow speeds.

ETCS drives Mainline Signalling Innovation

In a similar way that CBTC became the mainstream technology for mass transit metro railways, the European Train Control System (ETCS) has developed into the globally most popular signalling technology for mainline railways. This is mainly due to the multi-supplier initiative, driven by political harmonisation efforts for rail traffic across European borders, to develop an interoperable technology for automatic train protection which can be overlaid to improve legacy signalling systems.

It is therefore no surprise that ETCS is the most likely technology vehicle to bring high performance signalling to mainline railways. The cumulated investment in ETCS development is the highest of any signalling technology ever, the customer pull for technical innovation is significant, and there is a clearly defined vision for “ETCS Level 3” with moving-block signalling which aspires to bring CBTC-like capacity and performance to busy mainline railways.

However, the path to ETCS Level 3 is everything but straightforward. Functionally, the train integrity detection which is essential for moving-block signalling is much easier achievable for fixed-formation multiple units in metros than for loco-hauled freight trains of ever-varying length. Standardisation is difficult, too. Every signalling supplier in the ETCS development consortium UNISIG has an existing moving-block solution – their own CBTC product. But they are proprietary and non-interoperable, so developing an interoperable moving-block ETCS requires companies to redevelop their products, and potentially falling behind their competitors. Add the complex and time-consuming process for ratifying new releases of the ETCS standard, and you see why this is not the best of environments for fast-paced efficient technology advancement.

Bottom-Up Evolution does the Trick

I firmly believe the migration path towards ETCS Level 3 cannot happen top-down, from existing CBTC products without the will to change them, but must evolve bottom-up from the already interoperable basis of radio-based ETCS Level 2.

(Image Credit : Wikipedia) The Thameslink Project in London is a prominent Pioneer of enhanced ETCS Level 2 with Automatic Train Operation.

That's why I prefer calling this enhanced form of ETCS "Level 2+". Trains that are fitted with whatever add- ons that make out that "plus", for example Automatic Train Operation or virtual-block detection, can operate at higher levels of capacity and performance, while trains with normal ETCS Level 2 can still operate on the same lines, only at lower operational performance. Some people like to put a bit more hype into the naming of this ETCS evolution by calling it "Hybrid Level 3". You do you, but I find it misleading as it implies that ETCS Level 3 is just around the corner and already exists in parts. It doesn't.

New Technology Delivery needs common Sense

New signalling technology, in the perspective of a railway organisation, may just mean that the technology is novel for that railway. The challenge is then to embrace that novel technology and introduce it in a sensible, successful manner. In combination with the significant changes to operational processes and the organisational skills, competencies, roles and responsibilities required for utilising high-performance signalling, the "people factor" is at least as important for success as the technology itself.

Everybody agrees that CBTC or enhanced varieties of ETCS can bring substantial improvement to a railway system. But that does not come automatically, and there are worryingly many examples of epic failures in introducing those new signalling technologies. In almost every case the root cause of such failures is that somewhere along the line common sense was abandoned, for example by people trying to force something or to cut corners. Some examples, without naming the projects that suffered, include:

- The attempt to enforce interoperability between the CBTC products of two suppliers who appear to have no strategic interest in having interoperable CBTC products.

- The selection of an additional new CBTC supplier, just because they offered the lowest price, which then turned out to be incapable of delivering the project to the client's expectations.
- The decision to mix and match one supplier's interlocking with another supplier's CBTC through two separate contracts (which was revoked many painful years later).
- The assumption that interoperability between different suppliers is achieved by default just because the chosen technology is called ETCS.
- Using "procurement necessities" as justification to create a world-first combination of ETCS and CBTC, using different suppliers for both systems of course, where system integration is natural to become a nightmare.

Listen to Experts (If they are for Real)

The list above could go on, but fortunately there are also lots of positive examples where new or novel signalling technology was introduced smoothly, on schedule and pretty much within budget. There are some "experts" out there who really understand how this can be done. Listen to them, and if you get convinced that their advice matches your own common sense, follow that advice and you will be fine.

The more signalling systems we get that do no longer hamper but boost the capacity and performance of railway systems, the more we can relish the new, exciting times in signalling.

About the Author :

Mr.Doc Frank Heibel is a German-born and Australia-based independent strategist and thought leader for high-performance signalling technologies such as CBTC and ETCS. His mission is to bring modern signalling closer to non-signalling people, through no-nonsense advice of his clients, delivery of self-developed product- agnostic training courses for CBTC and ETCS, and provision of high-quality free content via social media, an email newsletter and a blog. It is virtually impossible not to find him via the internet, and he enjoys the mindful interaction with his ever- growing network. Feel free to "join the club".

NEW TECHNOLOGIES FOR SIGNALLING IN GLOBAL RAILWAY PROJECTS

Mr. Doc Frank Heibel

Metro Railway Strategist & Thought Leader

About the Author :

Mr.Doc Frank Heibel *is a German-born and Australia-based independent strategist and thought leader for high-performance signalling technologies such as CBTC and ETCS. His mission is to bring modern signalling closer to non-signalling people, through no-nonsense advice of his clients, delivery of self-developed product-agnostic training courses for CBTC and ETCS, and provision of high-quality free content via social media, an email newsletter and a blog. It is virtually impossible not to find him via the internet, and he enjoys the mindful interaction with his ever-growing network. Feel free to "join the club".*

Railway signalling has been evolving from a hindrance for higher capacity to an enabler of a better-performing rail operation. This quite personal account looks at some current technology trends in signalling and cautions that it is not just the technology which can make or break a successful project.

These are exciting times in railway signalling, so much better than they were thirty years ago. When I started my signalling career in the early 1990s, signalling for mainline railways had a bad reputation, for three reasons. One, most people in the rail industry considered signalling a "secret society" or "dark art" with its own language and vocabulary that was foreign and nearly impossible to understand for normal non-signalling folks. Two, whenever I travelled by train and the train stopped on the open track and the public address system finally offered an explanation, the claimed reason for stopping had almost inevitably to do with signalling.

By the way, I could bet that in many instances the "signalling problem" was just a regular red signal which protected our train from crashing into another one, which is undoubtedly a good thing. Three, signalling was perceived as the reason why we could not run more trains on these terribly expensive railway lines, thus preventing to make the best use of the railway system and assets.

Making Signalling Understandable

So, signalling is "nerdy and weird" and an inhibitor to railway capacity and performance, that's how I grew up career-wise. And I did not like any of that. I liked signalling though, so I stayed with it despite those prejudices. It took me over 20 years to do something practical about the lack of signalling understanding. My self-developed training courses on the fundamentals of modern signalling technologies such as CBTC and ETCS – I come back to those in a moment – have helped hundreds of rail professionals to improve their understanding of signalling and gain the confidence to talk at eye level with their peers about signalling topics. The trick is not to hide behind cryptic acronyms and convoluted historically-grown signalling principles, but to simplify explanations as long as needed until a halfway intelligent non-signalling person can understand them. This is meant to be my legacy, if there ever is one.

How New Are New Signalling Technologies?

But I digressed. Back to the other problem with signalling and the topic of this article. I'm not sure if the "new technologies" in signalling that revolutionise the railways these days are really that new. Automatic train operation, for example, has existed in railways for over fifty years since it was first introduced on the Victoria Line of the London Underground in 1968. And first installations of the Communications-Based Train Control (CBTC) technology with moving-block signalling already existed when I had my signalling woes in the early 1990s. But those CBTC installations were exceptions, and the railways using it were considered by many as the "odd ones out". An elevated skyrail in Toronto? A rubber-wheeled people mover between two airport terminals? A tiny light rail service in London Docklands? Outsiders, not the norm.

What Is Really New Here?

So it is not the technology itself which is so new in 2019. CBTC has meanwhile become the de-facto standard for control of high-performance metro railways in far over 100 cities around the world. In China alone there are over fifty cities which have, or are constructing, metro railways. India is

Hyderabad Metro has one of the first CBTC applications in India.

another country where CBTC technology spreads very nicely, and an increasing number of Indian metro lines benefit today from the outstanding capacity and performance offered by modern CBTC.

The other new trend in global signalling is the increasing adoption of what I call 'high performance signalling' to mainline railways. Mainline railways are not just lines for high-speed trains or other long-distance passenger and freight rail services. Mainline railways serve cities as well, and some of those systems such as London Overground or Paris RER have a network which is exclusively in and around major cities. As those cities grow, patronage demands for those railways skyrocket and in most cases the first buffer stop for higher capacity is the legacy fixed-block signalling system where even all practical attempts to have more and shorter block sections cannot get reliable operational capacity any higher than twenty trains per hour, at rather slow speeds.

ETCS Drives Mainline Signalling Innovation

In a similar way that CBTC became the mainstream technology for mass transit metro railways, the European Train Control System (ETCS) has developed into the globally most popular signalling technology for mainline railways. This is mainly due to the multi-supplier initiative, driven by political harmonisation efforts for rail traffic across European borders, to develop an interoperable technology for automatic train protection which can be overlaid to improve legacy signalling systems.

It is therefore no surprise that ETCS is the most likely technology vehicle to bring high performance signalling to mainline railways. The cumulated investment in ETCS development is the highest of any signalling technology ever, the customer pull for technical innovation is significant, and there is a clearly defined vision for "ETCS Level 3" with moving-block signalling which aspires to bring CBTC-like capacity and performance to busy mainline railways.

However, the path to ETCS Level 3 is everything but straightforward. Functionally, the train integrity detection which is essential for moving-block signalling is much easier achievable for fixed-formation multiple units in metros than for loco-hauled freight trains of ever-varying length. Standardisation is difficult, too. Every signalling supplier in the ETCS development consortium UNISIG has an existing moving-block solution – their own CBTC product. But they are proprietary and non-interoperable, so developing an interoperable moving-block ETCS requires companies to redevelop their products, and potentially falling behind their competitors. Add the complex and time-consuming process for ratifying new releases of the ETCS standard, and you see why this is not the best of environments for fast-paced efficient technology advancement.

Bottom-Up Evolution Does the Trick

I firmly believe the migration path towards ETCS Level 3 cannot happen top-down, from existing CBTC products without the will to change them, but must evolve bottom-up from the already interoperable basis of radio-based ETCS Level 2. That's why I prefer calling this enhanced form of ETCS "Level 2+". Trains that are fitted with whatever add-ons that make out that "plus", for example Automatic Train Operation or virtual-block detection, can operate at higher levels of capacity and performance, while trains with normal ETCS Level 2 can still operate on the same lines, only at

The Thameslink project in London is a prominent pioneer of enhanced ETCS Level 2 with Automatic Train Operation.

lower operational performance. Some people like to put a bit more hype into the naming of this ETCS evolution by calling it "Hybrid Level 3". You do you, but I find it misleading as it implies that ETCS Level 3 is just around the corner and already exists in parts. It doesn't.

New Technology Delivery Needs Common Sense

New signalling technology, in the perspective of a railway organisation, may just mean that the technology is novel for that railway. The challenge is then to embrace that novel technology and introduce it in a sensible, successful manner. In combination with the significant changes to operational processes and the organisational skills, competencies, roles and responsibilities required for utilising high-performance signalling, the "people factor" is at least as important for success as the technology itself.

Everybody agrees that CBTC or enhanced varieties of ETCS can bring substantial improvement to a railway system. But that does not come automatically, and there are worryingly many examples of epic failures in introducing those new signalling technologies. In almost every case the root cause of such failures is that somewhere along the line common sense was abandoned, for example by people trying to force something or to cut corners. Some examples, without naming the projects that suffered, include:

- The attempt to enforce interoperability between the CBTC products of two suppliers who appear to have no strategic interest in having interoperable CBTC products.
- The selection of an additional new CBTC supplier, just because they offered the lowest price, which then turned out to be incapable of delivering the project to the client's expectations.
- The decision to mix and match one supplier's interlocking with another supplier's CBTC through two separate contracts (which was revoked many painful years later).
- The assumption that interoperability between different suppliers is achieved by default just because the chosen technology is called ETCS.
- Using "procurement necessities" as justification to create a world-first combination of ETCS and CBTC, using different suppliers for both systems of course, where system integration is natural to become a nightmare.

Listen to Experts (If They Are for Real)

The list above could go on, but fortunately there are also lots of positive examples where new or novel signalling technology was introduced smoothly, on schedule and pretty much within budget. There are some "experts" out there who really understand how this can be done. Listen to them, and if you get convinced that their advice matches your own common sense, follow that advice and you will be fine.

The more signalling systems we get that do no longer hamper but boost the capacity and performance of railway systems, the more we can relish the new, exciting times in signalling.

MASS TRANSIT APPLICATION
CASE STUDY: BUS RAPID TRANSIT SYSTEM
PRODUCT: PLATFORM SCREEN DOORS (PSD)

Introduction: Bus Rapid Transit (BRT, BRTS, busway, transitway) is a bus-based public transport system designed to improve capacity and reliability relative to a conventional bus system.

Typically, a BRT system includes roadway that is dedicated to buses and gives priority to buses at intersections where buses may interact with other traffic alongside design features to reduce delays caused by passengers boarding, leaving buses or purchasing fares.

BRT aims to combine the capacity and speed of a metro with the flexibility, lower cost and simplicity of a bus system.

Product: Platform Screen Door is the important safety equipment in use for Bus Rapid Transit systems. These platform edge doors separate the stations with the traffic to prevent passengers from any injury caused by accidental falling outside.

Platform Screen Doors - full height & half-height are often used in ground stations, convenient to look-through and easy to install making them apt for BRT systems

Solution: TOSHI - Automatic Platform Screen Doors having its expertise in the field for the last 10 years, having implemented 6 Successful projects in India for platform screen doors.

Benefits:

- **Platform Screen Door Driving System** uses brushless DC motor as it's the main driving force for Durable and 24x7x365 Operations. Synchronised belt system then changes the rotary movement of motor into linear reciprocating movement of PSD making it to open and close. Self-locking of PSD is managed by controlling the motor driving program.

  When the PSD meets with any obstruction during closing, controller will receive a signal and send out a command to open the door to prevent any injury or damage.
- Unique Long Range Reader enabling Proper Bus Docking
- Remote Transmitter Based Operation with Bus Captain for Opening and Closing the Doors
- IOT Based Solution for keeping track of Door Functionality
- Easy and Scalable System

For further details , Contact :

TOSHI Automatic Systems Pvt. Ltd.
D-132, BSR Industrial Area, Ghaziabad, Uttar Pardesh
M-2 Samrat Bhawan, Ranjit Nagar , Commercial Complex, New Delhi
+91-8588867719, +91-120-2705117
sales@toshiautomatic.com
www.toshiautomatic.com

In Conversation with Mr. Pankaj Kumar Bansal, I.A.S. on Features of Chennai Metro; India

April 11, 2019 Interviews

Mr. Pankaj Kumar Bansal , I.A.S

Managing Director, Chennai Metro Rail Ltd

Rail Analysis : What type of challenges were faced in the construction of the first phase of the Metro Project ?

Mr. Bansal : There have been several challenges which were dealt with head on during the construction and implementation of the project. Some of the challenges were.

- Limited availability of works sites, difficult situation of road traffic diversion, limited time of disposal of mucks etc
- Rationalization of existing Public Transport Systems
- Common Ticketing Solutions and Revenue Sharing
- Crossing of Flyover: Balanced Cantilever Spans
- To facilitate crossing of the Kathipara fly over near Alandur, the Elevated Corridor No.2 has 3 spans of balanced cantilever type, (Spans 59, 75 & 39 m), which were constructed without providing any temporary supports from underneath and also without disturbing the traffic

Crossing of Suburban Railway :

a) Elevated : Steel Girders across Railway Tracks at Guindy At Guindy, the Corridor –I of Phase 1 of the CMRL project passes over the existing high traffic Southern Railway Track. In view of the Heavy Rail Traffic, steel girders of span 69 m and 36 m have been provided. These are the only spans which are made of steel, all others being of concrete. Most of the critical works over the tracks were done at night after getting line blocks from Southern Railway. Stringent safety precautions were maintained at all times and no accidents occurred during the construction.

b) Under Ground : The project runs from Egmore to Chennai Central, High Court to Chennai Central, Mayday Park to Chennai Central.

These tunnels have been built in coordination with Railway Team as the tunnels pass below the Operational Southern Railway Line; Intensity Instrumentation Monitoring had been performed on routine basis during the tunnel drive.

"The tunnels have been specially designed to handle the heavy load of southern railway track, Movable trains, and future expansion of the track"

- Passing of Tunnel under/vicinity of Heritage Building etc. : Madras High court, LIC building, Ripon building, Egmore Railway Station, St.Andrew's Church etc.
- Heavy Traffic : Traffic Constraints on Logistics/Storage. Traffic Diversion Schemes were implemented in stage wise to enable construction of stations on the on-road locations..
- High Water Table Area : The alignment is located in an area of high water table and the safe implementation relied upon the effective dewatering operations
- Non-performance by some of the contractors resulted in termination and re-award of balance works.

Rail Analysis : What are the future corridors of Chennai Metro Rail and what are the expected completion timelines for the same ?

Mr. Bansal : In order to meet the future traffic demands, the expansion of mass transit corridor is an imperative. A standalone Metro System of 54.1 km network of Phase 1 by itself, is not sufficient to address the traffic needs of Chennai. There is a case for considering expansion of Mass Transit options. Nationally and Globally, it is seen that the metro network expands progressively to cover entire city.

In this Context, Government of Tamil Nadu has planned to expand the Metro Rail System. Accordingly, the Detailed Project Report for Phase II has been prepared. The proposed Chennai Metro Phase II is covering a total length of 118.9 km and consisting of Three Corridors.

- Corridor 3 – (Madhavaram to SIPCOT) – 45.8 km
- Corridor 4 – (Light House to Poonamallee) – 26.1 km
- Corridor 5 – (Madhavaram to Sholinganallur) – 47.0 km

"As per Detailed Project report the expected time line for completion of this project is 2025-26."

Rail Analysis : Please inform us more about the Phase-2 project of Chennai Metro Rail? When will works for the phase-2 start ?

Mr. Bansal : The proposed Chennai Metro Phase II is covering a total length of 118.9 km and consisting of Three Corridors:

- Corridor 3 – (Madhavaram to SIPCOT) – 45.8 km
- Corridor 4 – (Light House to Poonamallee) – 26.1 km
- Corridor 5 – (Madhavaram to Sholinganallur) – 47.0 km

Out of 118.9 km Network, 76.3 km is elevated and 42.6 km is underground. There are 128 stations planned (i.e. 80 elevated and 48 underground stations). The Total estimated completion cost of the project is Rs. 69,180 Crores.

The estimated ridership for the year 2025 is 19.2 lakhs. The maintenance facilities for Corridor 3 & 5 is proposed at Madhavaram and a minor depot proposed at Siruseri Sipcot area. The maintenance facilities for Corridor 4 is proposed at Poonamallee. As per Detailed Project report the expected time line for completion of this project is 2025-26.

Rail Analysis : What are your plans to integrate Chennai Metro with other modes of public transport like Bus and Auto ?

Mr. Bansal : Chennai Metro Rail Limited has been advocating Multi Modal Integration (MMI) to ensure better mobility to metro users and the travellers using Public Transport. Multi Modal Integration as a strategy has been built into the Project Design stage itself.

"Phase 1 of Chennai Metro Rail Project corridor is running along the major arterial roads and connecting Road, Rail and Air Transport hubs such as Chennai Mofussil Bus Terminus (CMBT), Chennai Central station, Egmore station, Airport."

Similarly, as part of selection of Phase II network stations; Interchange with existing Sub urban Rail, Phase 1 Metro, City Bus, MRTS, etc., at various locations. The details are as follows:

Type	Corridor 3 (Madhavaram – Siruseri	Corridor 4 (CMBT – Light house)	Corridor 5 (Madhavaram – holingnallur)
Metro-Metro	Madhavaram, KMC, Thirumayilai, Sholinganallur	CMBT, Grain Market, Vadapalani, Nandanam, Thirumayilai	Madhavaram, CMBT, Grain Market, Alandur, St. Thomas Mount, Sholinganallur
Metro-Bus	Ayanavaram, Mandaiveli, Adyar	CMBT	MMBT, Villivakkam, CMBT
Metro-Suburban Rail	Perambur, Chetpet	Kodambakkam	Villivakkam, St. Thomas Mount
Metro-MRTS	Thirumayilai, Thiruvanmiyur	Thirumayilai	St. Thomas Mount 5)

Rail Analysis : What would be the role of CMRL in future metro projects in the State ?

Mr. Bansal : In this context, Chennai Metro Rail Ltd is also currently planning on the phase II expansion for the length of 118.9 km with 128 no's of stations. With the completion of the entire phase 1 and also being the recipient of the prestigious Platinum Rating from Indian Green Building Council (IGBC) for all 32 Metro Stations, CMRL has added another feather to its cap.

CMRL has always been committed to achieving the intended vision and mission of the organization with highest degrees of commitment and also with implementation of several effective and innovative techniques for the benefit of Chennai Public and the Project. It is with great pride, It can be said that CMRL would become the face of change in the public transport system in Chennai City by providing seamless integration with other modes of transportation.

This interview shall be covered in our March 2019 Edition Magazine with more details on Train 18 . Click Here to advertise in the magazine or know more on the same .

Some Past Related Updates which might interest you :

March 28, 2019 : Phase-2 of Chennai Metro to be operational by 2026

March 20, 2019 : Chennai Metro Update: Tender for phase-2 to be floated by June

March 18, 2019 : Chennai Metro Update: 32 Metro Stations awarded with IGBC Platinum RatingDMRC to Run All Its Operations from Solar Energy by 2021

April 18, 2019

- RRTS corridors to be integrated with Delhi Metro stations

April 17, 2019

- JBS-MGBS stretch of Hyderabad Metro to be ready by November-end

April 17, 2019

- Piyush Goyal discusses targets for 2019-20 with senior railway officials

  April 17, 2019

Metro Project Insights

- BMRCL to run first Driverless trains by 2021

  April 16, 2019

- Metro Man E Sreedharan reviews Srinagar Metro project

  April 13, 2019

- New Metro line to connect Delhi and Jhajjar via Gurgaon

  April 12, 2019

- In conversation with Mr. Pankaj Kumar Bansal, I.A.S. on Features of Chennai Metro

  April 11, 2019

- Hyderabad Metro Update: Works on JBS-MGBS Metro route to be completed by September

  April 10, 2019

- Kochi Metro Update: Metro to be extended till Thykoodam by June 2019

  April 9, 2019

- Kolkata Metro Update: Two more AC rakes begins their commercial run

  April 5, 2019

Metro Man E. Sreedharan reviews Srinagar Metro Project; India

April 13, 2019 Rail News

Srinagar: Metro Man E Sreedharan, the Principal Adviser to the J&K Government for the Mass Rapid Transit System (MRTS) project in the state, on Friday visited the proposed MRTS corridors for Srinagar city.

More Information

- Sreedharan along with Dheeraj Gupta, Principal Secretary, housing and urban development department, and Raghav Langer, Chief Executive Officer, J&K Economic Reconstruction Agency, conducted an on-the-spot inspection of various locations in the city, according to an official statement.
- The team had inspected various locations in Srinagar including- Shalteng Batmaloo, Jehangir Chowk, Amirakadal, Sonwar, Nowhatta, Sher-i-Kashmir Institute of Medical Sciences and Ellahi Bagh.

- Sreedharan was informed about the North-South and East-West corridors proposed by the RITES Limited, a PSU under Ministry of Railways, in its draft DPR (Detailed Project Report).
- The halting points would be decided keeping in view the high-density traffic areas, key business and administrative areas, where the daily influx of the commuters is huge, he was also informed.
- The RITES representatives gave on-the-spot presentation of the draft DPR prepared by it for the Srinagar MRTS project.
- The statement said, Sreedharan suggested some modifications during the site visit as per the ground conditions.

New Metro Line to connect Delhi and Jhajjar via Gurgaon; India

April 12, 2019 Rail News

New Delhi: Soon the Delhi and Jhajjar in Haryana are likely to be connected by the metro rail. The new metro line is likely to pass via Gurgaon. The proposed new metro line starts from Dwarka Sector-21 metro station and passes via Dwarka Expressway to reach Badsa in Jhajjar, according to the reports.

More Information:

- To identify the route alignment, the first field inspection was conducted on Wednesday.
- Metro connectivity is expected to ease the movement of patients at the AIIMS campus in Jhajjar, which will be the country's largest cancer institute – the National Cancer Institute (NCI).
- The DMRC (Delhi Metro Rail Corporation) and Haryana government will conduct traffic and technical feasibility surveys before coming up with a DPR (Detailed Project Report.
- The project cost expected to be shared by the Haryana government and central government.
- However, the project may start in a few years time, reports suggest.
- Several projects including residential and commercial are coming up along Dwarka Expressway.
- With this, large number of people who will move into new sectors will hugely benefit from the metro line.

To know more about recent developments of Delhi Metro: ***Click Here***

---

11 Apr, 2019: Delhi Metro Update: Subway connecting IGI Airport Terminal 1 to Magenta line to open by July

08 Apr, 2019: Delhi Metro Tender Update: Supply, Installation, Testing and Commissioning of Ballastless Track Stabling Lines

25 Mar, 2019: Delhi Metro Update: Uber, Ola to install kiosks at more Metro stations

Delhi Metro Update: Subway connecting IGI Airport Terminal 1 to Magenta Line to open by July; India

April 11, 2019 Rail News

New Delhi: The DMRC (Delhi Metro Rail Corporation) is constructing a subway that will connect the Terminal 1 of the Indira Gandhi International (IGI) Airport and the Metro's Magenta line. The project is estimated to be completed by July this year.

More Information:

- The 370-metre subway will connect the DMRC Magenta line metro gate to the arrival and departure gates of the Delhi airport's Terminal 1.
- There will be 2 entry/exit points of the subway at the arrival and departure terminals.
- Each point will be equipped with 2 elevators and escalators each along with staircases.
- The subway will also include elevators with a capacity of 26 people and travelators.
- Almost 60% of the work has already been completed, sources said.
- There is a footfall of about 66,000 passengers on the IGI T1 airport metro station every day out of the estimated 1,75,000 passenger footfall on the Terminal 1 of the Delhi airport, as per DMRC estimates.

Hyderabad Metro Update: Works on JBS-MGBS Metro Route to be completed by September; India

April 10, 2019 Rail News

Hyderabad: The HMRL (Hyderabad Metro Rail Ltd) is planning to complete the works on JBS (Jubilee Bus Station) to MGBS (Mahatma Gandhi Bus Station) route by September this year. Last month, services commenced on the Ameerpet-Hitech City route of the Hyderabad Metro.

More Information:

- The 10-km JBS-MGBS route is part of the corridor-2 from JBS to Falaknuma.
- There are 8 stations on the JBS-MGBS route.
- All the works pertaining to viaduct construction are completed.
- Currently, station works including roofs are being executed.
- An official said, efforts are being made to complete all the civil works by June, following which overhead cabling, signaling and other works will be taken up.
- The target is to complete all the works by September this year.
- For the balance 5.5 kms from MGBS to Falaknuma stretch on the old city route, survey for land acquisition is almost completed and so is the markings exercise.
- After the launch of services on the Ameerpet- Hitech City route, 56 kms of stretch are operational, making Hyderabad Metro the 2nd largest Metro in the country after Delhi Metro.
- Nearly 2.2 lakh passengers are travelling in the Metro services every day.
- Similarly, officials are anticipating heavy rush on the JBS-MGBS route once the services commence.
- Since the route passes through one of the densely populated corridors of the city, besides being a high traffic zone, the patronage is expected to be definitely encouraging.

- More importantly, the JBS-MGBS route serves as an important connectivity between JBS, Secunderabad railway stations with the MGBS and this will make things very convenient for long distance travelers.

To know more about recent developments of Hyderabad Metro: ***Click Here***

Kochi Metro Update: Metro to be extended till Thykoodam by June 2019; India

April 9, 2019 Rail News

Kochi: The DMRC (Delhi Metro Rail Corporation) is hopeful of completing the civil works till Thykoodam by June 2019. The track-laying works are on full swing. Likewise, the works of stations, including that of the wing bridges, are also progressing.

More Information:

- Currently, the Metro rail conducts services on the 18-km stretch between Aluva and Maharaja's College Stadium.
- There are a total of 16 stations at present.
- The total number of stations will be 21, by extending the service up to Thykoodam.
- The new stations are:
- Ernakulam South
- Kadavanthra
- Elamkulam
- Vyttila
- Thykoodam
- The total distance covered after this extensions will be 23.75 km.

- The remaining 1 kilometre stretch up to Petta will be completed in another year.
- The KMRL (Kochi Metro Rail Ltd) will also launch the Phase-I (A) extension from Petta to Tripunithura Railway Terminal via SN Junction at a total length of 2 km this year.
- The KMRL will launch the tenders for Petta-SN Junction-Tripunithura stretch soon.
- Sources said that the date for launching the commercial operations up to Thykoodam will be decided after consulting the state government.

Rail Analysis insights: The KMRL (Kochi Metro Rail Ltd) will also launch the Phase-I (A) extension from Petta to Tripunithura Railway Terminal via SN Junction at a total length of 2 km this year.

To know more about recent developments of Kochi Metro: ***Click Here***

Kolkata Metro Update: Two more AC Rakes begins their commercial Run; India

April 5, 2019 Rail News

Kolkata: Two more Air-Conditioned (AC) rakes have finally joined the Metro fleet and started their commercial run on Wednesday, almost 2 years after arriving in the city. The two rakes, built by the Integral Coach Factory (ICF), Chennai flunked multiple trials before getting the Commissioner of Rail Safety's clearance in December last year.

More Information:

- The authorities were awaiting the Railway Board's clearance before deploying the rakes for commercial run.
- A senior official said, the board's clearance came in the second half of Wednesday.
- The official said, one of the rakes left Dum Dum around 8.30pm on its maiden commercial run.
- The two rakes together made at least 4 round trips on Thursday.
- The older AC rakes make over 5 round trips every day.
- Three more AC rakes manufactured by the ICF reached city after the earlier two.
- Another official said, two of the newer rakes will start their commercial run soon.
- About 6 lakh people travel by Metro every day and the count is increasing by the year.

Rail Analysis insights: *The official said, one of the rakes left Dum Dum around 8.30pm on its maiden commercial run.*

To know more about recent developments of Kolkata Metro: ***Click Here***

BMRCL to run first Driverless Trains by 2021; India

April 16, 2019 Rail News

The BMRCL (Bangalore Metro Rail Corporation Ltd) to run driverless trains on its network by 2021, according to a report. The corporations is planning to run driverless trains on the Yellow Line (RV Road-Bommasandra), it said. This metro line will become operational by 2021.

More Information:

- The driverless trains will be introduced as part of the **CBTC (Communication Based Train Control)** system for the Yellow Line, TOI reported.
- This is the first time that CBTC is being used in Namma Metro.

- "The technology will help us run on automated mode while the operations are monitored through control centers," a senior official quoted as saying in the report.
- Currently, the Metro is using DTG (Distance To Go) system, in which the time between two trains is 2.5 minutes.
- The CBTC system can reduce train headway to less than 90 seconds.
- The CBTC system also reduces human error and ensures passenger safety.
- For instance, trains will automatically maintain a distance between one another with the help of sensors on tracks.

Bangalore Metro Update: Land Acquisition started for outer Ring Road (ORR) Line; India

Date: April 15, 2019

Bangalore: Process of acquiring properties has been started for the Metro's Outer Ring Road (ORR) line from Silk Board to K.R. Puram, according to a report. 39,300 sq. m of land required to build the 17-km line with 13 stations, it said.

More Information:

- The project is estimated to cost Rs. 4,200 crore, The Hindu reported.
- The project has been taken up under Phase-2A of Bangalore Metro.
- The government has issued notification for acquisition of land and properties for the project.
- Building of this stretch is crucial as the metro train to Kempegowda International Airport (KIA) will originate from here.
- In December last year, the BMRCL (Bangalore Metro Rail Corporation Limited) had cancelled the tender for construction of the line citing various reasons, including difficulty in taking possession of land, raising funds, and lower bid made by crisis-hit IL&FS.

- The BMRCL has paid Rs. 86 crore to Bangalore Development Authority (BDA) for providing 9,759 sq. m of land for construction of metro stations at HSR Layout, Agara, Doddanekundi, and Silk Board.
- "Unlike other metro lines, the number of properties required for the construction of this line is very less. We have identified 89 properties out of which 47 are private ones. There are properties of civic agencies such as BDA, BBMP and BWSSB. We have paid compensation to the BDA for acquiring land at various points," a BMRCL official quoted as saying in the report.

To know more about recent developments of Bangalore Metro: ***Click Here***

DMRC receives award for balanced Cantilever Structure; India

April 12, 2019 Rail News

Elevated Cantilever Construction over Railway Line at Ernakulum for Kochi Metro

Kochi: The DMRC (Delhi Metro Rail Corporation) has received the 'Sarvamangala Merit Award 2019', in the category of Excellence in construction.

More Information:

- Association of Consulting Civil Engineers India awarded DMRC for the construction of the elevated balanced cantilever structure near the Ernakulam Junction railway station in the Aluva-Petta corridor of the Kochi metro project.
- The cantilever was built at a cost of Rs. 58 crore.
- A DMRC statement described it as one of the toughest construction initiatives taken up by it.

- It said that the project, which took 2 years and 11 months, was executed without a hitch, thanks to good coordination between the railway authorities and S.P. Singla Constructions, Haryana, the contractor.
- The award will be presented on May 11 at the 27th annual awards function of the organisation in Bengaluru.

To know more about recent developments of Kochi Metro: ***Click Here***

PART II: ACTIVITIES FOR URBAN MOBILITY AS A SERVICE; INTERNATIONAL

CRRC presents first Tel Aviv Red Line LRV; Israel

Apr. 17, 2019
Written by Keith Barrow

THE first low floor LRV for Tel Aviv's light rail Red Line was presented to Mr Efi Kalifa, Tel Aviv Metropolitan Mass Transit System (NTA) vice-president, systems and technology, at the CRRC Changchun Railway Vehicles plant on April 16.

Related Posts
FTA approves Seattle light rail extension
Apr 11, 2019 | Light Rail
Thai light rail projects gain royal assent

Apr 10, 2019 | Light Rail
Mauritius light rail set for September opening
Apr 9, 2019 | Light Rail
Cologne renews light rail and bus contract with KVB
Apr 9, 2019 | Light Rail

CRRC was selected in November 2015 for a contract to supply 90 LRVs for the Tel Aviv Red Line with an option for 30 additional vehicles. CRRC will also maintain the fleet under a 16-year contract signed in September 2017.

The first two pre-series vehicles are due to arrive in Israel in the autumn.

The 25 km Red Line is due to open in 2021.

Categories: Light RailMiddle East
Tags: CRRCIsraelTel Aviv

METRO NEWSLETTERS

on

URBAN MOBILITY AS A SERVICE

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

TRANSPORTATION AND ECONOMIC DEVELOPMENTS IN MODERN URBAN/MEGAPOLIS ENVIROMENT

METRO Newsletter by Dr. F.A. Wingler
METRO 60, April 2019

INTAMIN (Switzerland) Monorail People Mover Steel-Beam Guideway Technology; Calabar Nigeria

PART I: ACTIVITIES FOR URBAN MOBILITY AS A SERVICE IN INDIA

Metro shelved, Chandigarh now plans Monorail; India

According to the proposal, the project will connect the tricity — Chandigarh, Panchkula and Mohali. In the first phase, 20 km network is proposed.

PUNJAB Updated: Jul 17, 2018 09:55 IST

By Hillary Victor

Hindustan Times, Chandigarh

Animation for the proposed first Phase Link of Panchkula with Sector-43 ISBT in Chandigarh (Biswajit Debnath/HT); Monorail People Mower with *INTAMIN* Steel-Beam Guideway Technology from Switzerland

After Union home minister Rajnath Singh put brakes on the much-touted metro rail project for Chandigarh in July last year, the Chandigarh administration is now planning to have monorail as an alternative model of mass transport in the city.

Monorail consists of a single track, typically elevated, with trains suspended from it.

A Switzerland-based company, **Intamin Transportation Limited**, has given presentation as well as proposal regarding constructing the monorail network to senior UT officers last week.

According to the proposal, the project will connect the tricity — Chandigarh, Panchkula and Mohali. In the first phase, 20km network is proposed.

During the presentation, the company stated that monorail has the capacity to ferry 10,000 to 12,000 passengers per hour per direction. The cost of construction will be around Rs 2,500 crore, which translates to Rs 125 crore per km.

Company's representative Suniti Varma said monorail is environmentally friendly transportation system that runs on clean electrical energy.

'Viable for Tricity'

"The best part is that the project is viable in the tricity because of the light-weight track system that can be easily incorporated into the existing infrastructure," said Varma. The firm said the monorail can be operated both automatically and manually with a driver on board.

A senior UT officer, who did not wish to be named, said the company has given its presentation and now the administration is studying the proposal in detail.

"We will have another round of meeting before giving the project a go-ahead," said the officer.

If and when the project is approved, a technical and engineering feasibility study of the routes will be conducted followed by development and submission of a business plan and detailed project report, said sources. While private players are expected to contribute 80% cost of the project, the remaining 20% will be borne by the Chandigarh administration.

Why no to Metro

It was in July last year during the home minister's advisory committee meeting in New Delhi that Rajnath Singh said no to the **Metro project in Chandigarh, calling it non-viable, and asked the officers to look for alternative modes of transport.**

Even the Chandigarh officers admitted that at Rs 14,000 crore, the project is not financially feasible. Also, neither Punjab nor Haryana had given their consent in writing.

Member of Parliament (MP) Kirron Kher had already opposed the project stating that it would uproot the city. As a solution to traffic congestion, she had proposed a ring road.

First Published: Jul 16, 2018 09:28 IST

Swiss *INTAMIN* Steel-Beam Guideway Monorail Technology envisaged for Chandigarh; India

Animation: Monorail Swiss *INTAMIN* Steel-Beam Guideway Technology

The *INTAMIN* Monorail P30 People Mover of Swiss Technology, running on a Steel-Beam Guideway with inflated Rubber Tires, is a response to demands and requirements of urban transportation authorities and airport operators, for a safe, fast and reliable transportation technology for **Mobility as a Service, MaaS**, especially in areas, where Metro-Rail will be not feasible.

It is of lighter Structure than that of a Straddle Concrete Beam Monorail. It can be laid underground, at grade and as well on elevated structure. It can negotiate tight curves and steep gradients like a roller coaster.

The system is most suitable for public transportation services in cities and allows city planners an easy implementation of a mass transit system, even into difficult environments. The train is characterized by an innovative design, spacious cabins, convenient for both standing and seated passengers and is equipped with large size door openings for easy and quick passenger access. ***INTAMIN*** People Mover Systems are characterized by route planning flexibility, low construction costs, low operation costs due to the high automation degree and are environmental friendly with virtually no emissions.

The train guiding system combined with a sophisticated automatic train protection and guiding solution, allows for a driverless operation of the trains and optimization of line performance while improving the safety of operation. The high degree of automation makes it also possible to operate the system with a minimum number of staff. State-of-the-art communications systems with on-board passenger information system together with large window areas enhance the environment to a superior level of comfort. The trains travel quietly and quickly to their destinations, offering an efficient transportation method, especially during the rush hour.

INTAMIN Monorail Steel-Beam Guideway for Calabar; Nigeria

INTAMIN Steel-Beam Guideway of Monorail People Mover, Calabar, Nigeria

Changing the Way India travels by ANDROMEDA Technologies for Monorail on Steel-Beam Guideway; India

Image: *INTAMIN* Steel-Beam Guideway Monorail in Moscow; Russia

PART II: ACTIVITIES FOR URBAN MOBILITY AS A SERVICE; INTERNATIONAL

MTS rolling out new Trolleys; San Diego,USA

Written by Andrew Corselli, Managing Editor

As the San Diego Metropolitan Transit System (MTS) gets set to roll out the next generation of light rail vehicles (LRVs) for service on the UC San Diego Blue Line on April 20, MTS officials recently unveiled the first car of the new LRV series during a "Trolley Open House."

The new LRVs will enter service as part of the 5000 Series vehicles from Siemens, representing the "third generation of modern, low-floor vehicles that have been in operation on MTS' light rail network since 2005."

MTS said the 45 new S700 LRVs have the same low-floor characteristics as newer models in MTS' current fleet, but feature a redesigned middle section to improve passenger flow and provide door-to-door accessibility for riders in wheelchairs or other mobility devices. To facilitate cleaning and maintenance, train seats are upholstered in vinyl rather than the cloth used in previous models. Additional features include improved interior sightlines for added security and relocated operational equipment to facilitate easier access by maintenance technicians.

For the past seven months, MTS has been receiving new Siemens S700s cars via an order of 45 vehicles placed in 2016—the first of which was delivered last August and came in the San Diego Trolley's "iconic red paint scheme."

MTS said that in addition to putting the vehicles into service now, it will use the new vehicles to increase service on the UC San Diego Blue and Orange lines beginning June 9.

"It's important for our transit system to be accessible to everyone, especially members of our disability community," said Georgette Gómez, San Diego City Council President and MTS Board Chair. "These new Trolleys are an example of how MTS continues make improvements to help all of our passengers access the system better."

"These next-generation vehicles represent the true partnership that exists between MTS and Siemens," said Paul Jablonski, CEO, MTS. "We worked closely over the last three years to ensure that these vehicles meet the needs of our system and our riders."

Categories: Light Rail, News, Passenger Tags: Breaking News, San Diego MTS

Tel Aviv light Metro Vehicle rolled out; Israel

17 Apr. 2019

ISRAEL: CRRC Changchun rolled out the first of the light metro vehicles it is supplying for the Red Line in Tel Aviv on April 16.

Project promoter NTA signed a contract at the end of 2015 for 90 vehicles with an option for 30 more. The rolling stock will be equipped with air-conditioning and LED lighting. NTA Systems & Technologies Vice-President Efi Kalifa was present at the roll-out ceremony, which included a test ride at the factory.

Due to open in October 2021, the 23 km Red Line will link Petakh Tikva northeast of Tel Aviv with Bat Yam to the south, with around half the route underground. The 1 435 mm gauge line is being electrified at 25 kV AC.

Related news

- 19 Apr 2019 - UKVZ to supply more trams to Krasnodar
- 02 Oct 2017 - Alstom to supply Tel Aviv Red Line signalling
- 13 Sep 2017 - CRRC Changchun signs Tel Aviv fleet maintenance contract
- 20 Feb 2017 - Tel Aviv Red Line tunnelling begins
- 30 Nov 2015 - Changchun selected for Tel Aviv Red Line rolling stock contract
- 29 May 2015 - Tel Aviv Red Line contractor selected

Urban Transport news in Brief; International

18 Apr. 2019

Mobile Ticketing was introduced on the **Melbourne** suburban rail network on March 28.

Chinese companies are to undertake a feasibility study for construction of **a Monorail** in **Phnom Penh**, under a co-operation agreement between the Cambodian capital and Chongqing Municipality.

Contactless Ticketing was launched on the **Singapore** metro on April 4.

Seoul Metro has signed a memorandum of agreement with the People's Committee of Vietnam to develop plans for a metro network in **Da Nang**, along with South Korean contractors Lotte Engineering & Construction and Saman.

Riyadh Metro has taken delivery of two Terberg-Zagro road-rail rescue vehicles.

Boring of the 1·5 km tunnel between Michurinsky Prospekt and Prospekt Vernadskogo on the future **Moscow** metro Line 11 was completed on April 8. China Railway Construction Corp is the main tunneling contractor.

The city of **Köln** has given a direct award to KVB to continue running the city's light rail and buses for 22½ years from January 1 2020.

Pesa has been selected as preferred bidder to supply 10 more Fokstrot trams to **Kyiv**.

The city of **Kraków** has extended the tram operations contract of MPK Kraków for 16 years, to March 31 2035.

Nürnberg transport operator VAG has ordered a further seven G1 metro trainsets from Siemens.

A VDL Citea SLFA-180 Electric Bus has been put into service in **Orléans**.

Zagro Bahn- und Baumaschinen has delivered a Unimog U 430 Euro VI to **De Lijn** for maintenance work on the coastal tram route in Belgium.

Düsseldorf transport operator Rheinbahn has ordered 10 electric buses from Irizar for delivery in late 2019 and early 2020.

Transport Infrastructure Ireland and the National Transport Authority have announced the preferred route of the MetroLink metro line, which is to run from Estuary north of Swords to southern **Dublin**.

The UK government has granted the West Midlands Combined Authority legal powers under the Transport & Works Act for the construction of phase two of the **Birmingham** Westside extension of the West Midlands Metro tramway. Construction is planned to begin this year for opening in 2021.

The City of **Ottawa** and TransitNEXT have reached financial close on the southern extension of the Trillium Line.

Istanbul plans third Heritage-Style Tramway; Turkey

23 Apr. 2019

TURKEY: Istanbul Metropolitan Municipality has announced plans to build a new heritage-style tram line.

The 2·2 km route planned for the Esenler district would connect Menderes station on metro Line M1B with Yıldız Technical University Davutpaşa Campus, running along Atışalanı Caddesi and Davutpaşa Caddesi. It would serve five stops along a single-track line. Services would be operated using one tram with capacity for 45 passengers. The project is estimated to cost TL10·5 m, and opening is planned for 2020.

Istanbul currently has two heritage-style tram lines. T2 is in the Beyoğlu district on the European side of the city, and T3 forms a circular route in Kadiköy on the Asian side.

Edinburgh Tram extension project approved, UK

Apr. 24, 2019
Written by David Burroughs

THE City of Edinburgh Council has approved the extension of the city's light rail line from York Place north to Newhaven, with Morrison Utility Services (MUS) awarded the swept path contract and a Sacyr, Farrans and Neopul joint venture (SFNJV) awarded the infrastructure and systems contract.

Kevin Smith

Under the swept path contract, MUS will work ahead of SFNJV to identify and clear any below ground obstructions along the 4.7km route, which will add eight stops to the line.

The infrastructure and systems contract covers the design and construction, systems integration, testing, commissioning and bringing the line into operation.

The £207m project received final approval from the full council in March, with the six-month early contractor involvement stage due to begin in mid-May before full construction begins later this year.

The extension is due to open in early 2023, and is expected to double passenger numbers on the line to 16 million annually.

The line to Newhaven was originally due to open as part of the first phase of the Edinburgh tram project, but construction of the section beyond York Place was cancelled in April 2009 after a massive escalation in the overall cost of Phase 1A.

Canberra's first LRT opened; Australia

April 22, 2019

On 20. April, Canberra's first light rail route was put into commercial operation on Gungahlin – City route, when the system transported 24,600 passengers. The 12-km LRT, served by 13 stops, links the northern town centre of Gungahlin with Canberra city centre, running along Northbourne Avenue, the Federal Highway and Flemington Road. The PPP project was won by the Canberra Metro consortium under a contract for approximately 23 years that included the construction and operation of stage one of LRT network for 20 years. At the end of the contract term, the ACT Government will assume ownership of LRT network assets.

Canberra Metro is a consortium consisting of Pacific Partnerships, CPB Contractors, John Holland, UGL, Mitsubishi Corporation, Aberdeen Infrastructure Investments, DB Engineering & Consulting, CAF and Mitsubishi UFJ Financial Group Ltd (MUFG).

The line is operated by Urbos trams, supplied by CAF which will also provide maintenance services. Under the contract, CAF delivered 14 Urbos 3 LRVs, made 5 modules based on the Urbos platform. These are 100% low floor bidirectional vehicles providing easy access and moving inside the tram for all users. The units are designed for the eventual retrofit of

an on-board energy storage system which enables catenary-free running between stations.

Digitalisation discussed at Asia-Pacific Rail; Hong Kong

23 Apr. 2019 | by **Mike Baxter**

Asia-Pacific Rail was held in Hong Kong in late March.

The application of digital technology to metros was a core theme at the 21st Asia-Pacific Rail conference in Hong Kong.

The digitalisation of railways is 'both an opportunity and a challenge', the recently-promoted CEO of Hong Kong's MTR Corp Jacob Kam told the opening plenary at the Asia Pacific Rail conference on March 19.

And he should know. In the early hours of the previous day, MTR had suffered its first recorded train collision, when two empty EMUs collided outside Central station during testing of the metro's new HK$3·3bn signalling system. While full details have yet to emerge, it seems that trains were operating in ATO mode under an unprecedented third-level safety system that MTR had specified should intervene if both the main Thales train control technology and its backup had failed. Somehow this had instructed both trains to use the scissors crossover at the same time.

Pointing out that MTR was in the midst of a complex modernisation, Kam said a large percentage of the operator's profits would be required to fund investment in a network which is now approaching its 40th birthday. As well as signalling, this included replacing the oldest trains and the station ventilation. MTR hopes the update will improve average

punctuality from 99·94% to 99·95%, but Kam reminded delegates that some routes were close to their maximum capacity, with the network now carrying 5·9 million passengers per day.

Rising Expectations

Attracting more than 2 000 delegates — the biggest attendance yet — this year's Asia Pacific Rail saw two packed days of presentations, with six parallel sessions as well as seminars and panel discussions.

Opening the first plenary looking at developments on the major Asian metro networks, T C Chew, Global Rail Leader at Arup, noted that passenger expectations continue to rise, while operators needed to address the effects of climate change, sustainability, digitalisation and the replacement of ageing staff. While many metros were still expanding unabated, there were challenges around the financing of new projects while maintaining safe and efficient operation on older lines.

Kam said digitalisation offered many opportunities to provide better customer service, providing passengers with advance information using smartphone apps, not just about delays on their line or overcrowding at stations, but also to remind them where they are due to get off! MTR Operations Director Adi Lau reflected on the maintenance possibilities opened up by big data, the Internet of Things and Blockchain, such as remote condition monitoring and predictive maintenance. However, he warned that the funding available was insufficient to implement all of these features at present.

Reiterating that skilled staff were required to develop and implement new systems, Gary Lampard of Public Transport Victoria emphasised the critical need for a strong safety culture. With cybersecurity an ever-present concern, management needed to develop the requirements on a top-down basis and focus on the basics, while avoiding complacency. His colleague Peter Munro from Metro Trains Melbourne spoke about using artificial intelligence to improve the efficiency of operations, notably train service and possession management. Incidents might be dealt with much faster in a better working environment, but he pointed out that in many cases someone was still needed to attend to problems on site.

Munro also raised the issue of 'information overload', questioning how much data could now be collected, and how the resulting knowledge should be applied in the most efficient way. Alex Barron from Imperial College, London, reported that harnessing and collating big data was proving to be a very real problem.

Training Challenge

Pointing out that MTM was rapidly adding digital technology on its trains, signalling and stations as well as building new lines, Munro emphasised the challenge to recruit appropriate staff capable of dealing with it.

This was also raised by Michael Harrison, Head of Operations for SBS Transit in Singapore. Noting that new staff were required to be 'tech-savvy', Harrison said there was major issue around how such people interacted with existing employees trained in traditional skills. The rate of change was still slow, he reported, and keeping the existing system moving while maintaining safety was proving difficult.

Singapore continues to be a remarkable leader in urban transport planning, and LTA's Deputy CEO Chua Chong Kheng updated delegates on progress with the developments

he had presented in 2018. Given the island's limitations on space for further road infrastructure, LTA has implemented a policy to halt the increase in car ownership. To cope with demand, the metro is being expanded, along with cycle, bus and taxi interchange facilities and extensive covered walkways linking stations with transitoriented developments.

Future plans are based on increasing the metro's modal share from 75% to 85%, while any journey of less than 20 km should be possible within 20 min. The Cross-Island Line would be worked by eight-car trains as soon as it opens in 2027. Noting that digitally trained staff was needed for a wide range of systems including condition monitoring, predictive maintenance and resource management, Kheng said training was continuing, but pointed out that even Singapore was suffering from an urgent need to find electrical and electronic engineers.

- April 25, 2019
- Ballast, Ties, Rail, Passenger, Rapid Transit/Light Rail, Track Structure

RailWorks lands $85 Million Deal for Light-Rail Track in Minneapolis; USA

Written by Paul Conley, Editor-in-Chief

Southwest LRT; Minneapolis

RailWorks Corp. won a contract to build new 14.5-mile double track light rail track for the Southwest Light Rail Transit project in metropolitan Minneapolis.

The track will run from Southwest Station in Eden Prairie, Minn., to Target Field Station in Minneapolis. Work on the project includes more than 110,500 TF ballasted track; more than 29,000 TF direct fixation on the structure; more than 6,900 TF direct fixation in tunnel; and more than 3,500 TF embedded, special trackwork and crossings, according to a written statement from RailWorks.

Additionally, RailWorks will inspect and maintain a roughly 5-mile section of Twin Cities & Western (TC&W) Railroad Track that lies adjacent to the new light rail tracks. The enhancements to the existing freight line will also create some additional space for the new light rail tracks.

The RailWorks contract is for $85 million. Work on the existing freight rail will begin this spring, and the construction of the new light rail tracks will start in 2020. The complete project will wrap up in 2022.

RailWorks is doing the work as a subcontractor to the Lunda/McCrossan joint venture that was awarded the SWLRT civil construction contract last fall. Lunda Construction teamed with C.S. McCrossan on the $799.5 million bid. Work began on the complex project late last year.

In March, the Metropolitan Council, which oversees the light-rail system, awarded a $2.88 million contract to RailWorks to repair track near the Mall of America.

RailWorks provides track and transit systems construction and maintenance services throughout the United States and Canada. A privately held company, RailWorks provides construction services for transit authorities, Class I and short-line railroads as well as commercial and industrial companies with rail infrastructure. RailWorks company brands include L.K. Comstock Inc., PNR RailWorks, HSQ Technology, and NARSTCO.

METRO NEWSLETTERS
on
URBAN MOBILITY AS A SERVICE

PUBLIC MULTIMODAL URBAN, SUBURBAN AND INTERURBAN PASSENGER TRANSIT SYSTEMS WITH METRO-BUS, LIGHT-RAIL, TRAM-TRAIN, METRO-RAIL, LIGHT METRO-RAIL, METRO-TRAIN, REGIONAL RAPID TRANSIT, COMMUTER-RAIL, RUBBER WHEEL METRO ON GUIDEWAY, ROPE-WAY/TRAIN, LINEAR INDUCTIVE MOTOR, MAGLEV AND HOVERCRAFT TRANSIT/PEOPLE MOVER, WATER-METRO, AUTONOMOUS PEOPLE-MOVER

TRANSPORTATION AND ECONOMIC DEVELOPMENTS IN MODERN URBAN/MEGAPOLIS ENVIROMENT

METRO Newsletter by Dr. F.A. Wingler
METRO 62, May 2019

Rapid KL - Kelana Jaya Line; Kuala Lumpur, Malaysia;
Linear Induction Motor towed Light *INNOVIA* Metro

PART I: ACTIVITIES FOR URBAN MOBILITY AS A SERVICE IN INDIA

Mangaluru: CM mentions Metro Train Project for City in State Nudget; India

Sat, Feb. 9 2019 11:35:17 AM

Daijiworld Media Network - Mangaluru (MS)

Mangaluru, Feb 9 2019: In an important development, a plan to start metro train network in second tier cities like Mangaluru and Mysuru is mentioned in the state budget that was presented by H D Kumaraswamy on Friday, February 8.

This will be a feather in the cap for this coastal city as it already boasts of **very good connectivity through land, air, water and rail mode of transport. The addition of metro train will be a compliment for the growing tourism industry of the coastal region. If this materializes, then there will be no doubt that the city, which is termed as a 'Smart City' for the future, will grow in rapid pace.**

This city is among the only few cities in the country, **which has all the three modes of transport.** Though the city is limited to corporation area with respect to the administration, its actual area is expanding well beyond the city limits. There is a proposal to form greater Mangaluru also which will include the villages around the city, Mulky, Ullal town municipality areas and Konaje. It is estimated that another two lac people will be added to the population of the city corporation by the formation of greater Mangaluru.

Keeping in mind the pace at which the city is developing, it is demanded that metro network is very essential for easier and faster way to commute around the city.

The railway network project in the city was initially planned decades ago. In 2006, there was a **proposal to build Sky Bus Network in the city.** In 2008, when BJP was in power, proposal for **a feasibility report on running monorail in the city was made**. But both the projects did not take off at all. It is hoped that at least this time around the proposal turns into reality.

Kozhikode Light Metro Project; India

From Wikipedia, the free encyclopedia

Route Plan for Kozhikode MRTS/LRTS

Kozhikode Light Metro is a proposed Mass Rapid Transport System (MRTS) for the city of Kozhikode (Calicut), in India. In 2010, the State government explored the possibility of implementing a metro rail project for Kozhikode city and its suburbs. The proposal was to have a corridor connecting the Karipur Airport to the Kozhikode Medical College Hospital through the heart of the city. An inception report was submitted by a Bangalore-based **Consultant, Wilber Smith**, on the detailed feasibility study on the prospect of implementing the Mass Rapid Transport System (MRTS) and Light Rail Transit System (LRTS) in the city. However, the project has been scrapped to be replaced by Kozhikode Monorail project. The State Cabinet then decided to form a special purpose vehicle (SPV) to implement monorail projects in Kozhikode and Thiruvananthapuram, and administrative sanction was given in October 2012. The state government issued orders entrusting the Thiruvananthapuram Monorail project to the KMCL on 26 November 2012. The government had handed over the Kozhikode Monorail project to the KMCL prior to that. On 12 June 2013, the State Cabinet gave clearance for an agreement to be signed between KMCL and DMRC, that would make the latter the general consultant for the monorail projects in Kozhikode and Thiruvananthapuram. The DMRC will receive a consultancy fee of 3.25% of the ₹ 55.81 billion (₹ 35.90 billion for Thiruvananthapuram and ₹ 19.91 billion for Kozhikode). The agreement was signed on 19 June 2013. However, due to cost overrun and the cold response from the bidders the project was put on hold. Bombardier Transportation was the only bidder for the project. The project was later scrapped and **Light Metro was proposed.**[

The Proposal

The Union Urban Development Ministry decided to consider the proposal for a Metro in Kozhikode after the success of the Delhi Metro and signed up for drawing the detailed project report (DPR) of the Rs.27.71 billion Kozhikode metro transport project with Delhi Metro Rail Corporation as a feasibility study for the introduction of suburban services in Kozhikode city. The Ministry decided to bear 50% of the cost of the preparation of the DPR for the city that comes under the population cut-off bracket. The preliminary feasibility study had been carried out by the National Transportation Planning and Research Centre (NATPAC) in association with the Kerala Road Fund Board in December 2008. Based on this feasibility report, the Board entrusted **Wilber Smith** to conduct the study in June 2009. Already, the NATPAC has submitted a metro rail project covering a total distance of 32.6 km from Karipur to the Calicut Medical College. The cost of the project was estimated at Rs. 27.71 billion and was expected be completed within five years. The monorail project which replaced the metro rail project was estimated to cost Rs 1,991 crore has received a bid from the lone bidder Bombardier consortium, and was almost double of the estimate. The project was scrapped and the Light Metro has been approved.

PART II: ACTIVITIES FOR URBAN MOBILITY AS A SERVICE; INTERNATIONAL

Medium-Capacity Light Metro Rail; International

From Wikipedia, the free encyclopedia

Rapid KL - Kelana Jaya Line; Kuala Lumpur, Malaysia
Linear Induction Motor towed *INNOVIA* (System: Bombardier) Light Metro for an Advanced Rapid Transit (ART)

Excerpts from Wikipedia:

A Medium-Capacity System (**MCS**) is a rail transport system with a capacity greater than light rail, but less than typical heavy-rail rapid transit. It is also known as **Light Metro** or **Light Rapid Transit**.

Since ridership determines the scale of a rapid transit system, statistical modeling allows planners to size the rail system for the needs of the area. When the predicted ridership falls between the service requirements of a light rail and heavy rail or metro system, an MCS project is indicated. An MCS may also result when a rapid transit service fails to achieve the requisite ridership due to network inadequacies (e.g. single-tracking) or changing demographics.

In contrast with most light rail systems, an MCS usually runs on a fully grade separated exclusive right-of-way. In some cases, the distance between stations is much longer than typically found on heavy rail networks. An MCS may also be suitable for branch line connections to another mode of a heavy-capacity transportation system, such as an airport or a main route of a metro network.

The definition of a medium-capacity system varies due to its non-standardization. Inconsistencies in international definitions are even reflected within individual countries. For example, the Taiwan Ministry of Transportation and Communications states that each MCS system can board around 6,000–20,000 passengers per hour per direction (p/h/d or PPHPD), while the Taiwan Department of Rapid Transit Systems (TCG) suggests an MCS has a capability of boarding around 20,000–30,000 p/h/d and a report from the World Bank places the capacity of an MCS at 15,000–30,000 p/h/d. For comparison, ridership capacity

of more than 30,000 p/h/d has been quoted as the standard for metro or "heavy rail" standards rapid transit systems, while light rail systems have passenger capacity volumes of around 10,000–12,000 p/h/d[4] or 12,000–18,000 p/h/d.[Generally speaking, medium capacity systems has a lower ridership capacity when compared to other heavy rail systems in the same area. However, passenger capacity volume is just one possible criterion used to define a medium-capacity rail transit system.

Another criterion that can be used to define a medium-capacity rail system is vehicle type. For example, the train in an MCS may have a shorter configuration than the standard metro system, usually three (though, in some cases, just two) to six traincars, allowing for shorter platforms to be built and used. Rather than using steel wheels, rubber-tyred metro technology, such as the VAL system used on the Taipei Metro, is sometimes recommended, due to its low running noise, as well as the ability to climb steeper grades and turn tighter curves, thus allowing more flexible alignments.

Fully heavy rail or metro systems generally have train headways of 10 minutes or better during peak hours.[Some systems that qualify as heavy rail/metro in every other way (e.g. are fully grade separated), but which have network inadequacies (e.g. a section of single track rail) can only achieve lesser headways (e.g. every 15 minutes) which result in lower passenger volume capacities, and thus would be more accurately defined as "light metro" or "medium-capacity" systems as a result.

Terminology

Lyon Rubber Tired Light Metro VAL on Guideway; France

In addition to MCS, *light metro* is a common alternative in European countries, India,and South Korea.

In some countries, however, light metro systems are conflated with light rail. In South Korea, *Light Rail* is used as the translation for the original Korean term, "경전철" – its literal translation is "Light Metro", but it actually means "Any railway transit other than heavy rail, which has capacity between heavy rail and bus transit". For example, the U Line in Uijeongbu utilizes VAL system, a variant of medium-capacity rail transport, and is therefore categorized "light metro" by LRTA and others, though the operator itself and South Korean sources refer to the U Line as "light rail". Busan–Gimhae Light Rail Transit is also akin to a light metro in its appearance and features, thought the operator refers it as a "light rail". Likewise, Malaysian officials and media commonly refer to the Kelana Jaya, Ampang and Sri Petaling lines as "light rail transit" systems; when originally opened, the original Malay abbreviations for the lines, PUTRA-LRT (*Projek Usahasama Transit Ringan Automatik*/Automatic Light Transit Joint Venture Project) and STAR-LRT (*Sistem Transit Aliran Ringan*/Light Flow Transit System) did not clearly distinguish between light rail and light rapid transit. Some articles in India also refer to some "light metro"-type systems as "light rail". The Light Rail Transit Association (LRTA), a nonprofit organization, also categorizes several public transport systems as "Light Metro".

As mentioned above, VAL (Véhicule Automatique Léger) systems are categorized in the medium-capacity rail systems family because their manufacturer defines their passenger capacities as being up to 30,000 p/h/d.

In Hong Kong, MTR's Ma On Shan Line could, in some contexts, be classified as a MCS (as it has used shorter four-car SP1950 trains) but can attain up to 32,000 p/h/d which is comparable to the passenger capacity of some full metro transit networks This classification will not last for much longer as full-length, 8-car trains are being deployed on the line in advance of its merger with the West Rail Line to form the East West Corridor by 2019. Two other lines, the Disneyland Resort Line shuttle service to Hong Kong Disneyland Resort since 2005 and the South Island Line since December 2016, are also built to MCS standards.

Advantages and Disadvantages

The main reason to build a light metro instead of a regular metro is to reduce costs, mainly because this system employs shorter vehicles and shorter stations.

Light metros may operate faster than heavy-rail rapid transit systems due to shorter dwell times at stations, and the faster acceleration and deceleration of lighter trains. For example, express trains on the New York City Subway are about as fast as the Vancouver SkyTrain, but these express trains skip most stops on lines where they operate.

Medium-capacity systems have restricted growth capacities as ridership increases. For example, it is difficult to extend station platforms once a system is in operation, especially for underground railway systems, since this work must be done without interfering with traffic. Some railway systems, like Hong Kong and Wuhan, may make advance provisions for longer platforms, for example, so that they will be able to accommodate trains with more, or longer cars, in the future. Taipei Metro, for example, constructed extra space for two extra cars in all its Wenhu Line stations.

Bombardier INNOVIA ART powered by a linear Induction Motor; International

Rapid KL - Kelana Jaya Line; Kuala Lumpur, Malaysia
Linear Induction Motor towed *INNOVIA* (System: Bombardier) Light Metro for an Advanced Rapid Transit (ART)

Innovia Metro (stylized as **INNOVIA Metro**) is the current name given to an automated rapid transit system manufactured by Bombardier Transportation. **Innovia Metro Systems** run on conventional metal rails and pull power from a third rail, but are powered by a linear induction motor that provides traction by pulling on a "fourth rail" placed between the running rails. A new version of the technology being marketed by Bombardier is compatible with standard electric rotary propulsion.

The design was originally developed in the 1970s by the Urban Transportation Development Corporation (UTDC), a Crown corporation owned by the government of Ontario, Canada. It was designed as a system that would provide economic rapid transit service in the suburbs, which would have ridership levels between what a bus could serve at the low-end, or a subway at the high-end. During development the system was known as the ICTS (Intermediate Capacity Transit System). Sales of the ICTS were made for metro lines in Vancouver, Toronto and Detroit. Further sales were not forthcoming and the Ontario government lost interest in the company, selling it to Lavalin of Quebec in 1986. Lavalin ran into serious financial difficulties and the UTDC returned to Ontario control, only to be immediately sold to Bombardier.

Bombardier used the name Advanced Rapid Transit (ART) after its acquisition of the technology. Bombardier has been much more active in developing and promoting this system, introducing a major new revision and winning several additional sales in New York City, Beijing, Kuala Lumpur and Yongin, near Seoul. The latest version of the technology is being marketed as the Innovia Metro, while previous models are retroactively branded as Innovia ART. The largest Innovia Metro system today is part of the Vancouver SkyTrain metro network, which has seen several major expansions over its lifetime, with several more being planned. It operates just less than 50 km (31 mi) of track compatible with

Innovia Metro trains. Vancouver was the first to order INNOVIA Metro 300 vehicles. Since then vehicle orders for the latest **INNOVIA Metro Technology** has been made by transit authorities in Kuala Lumpur and Riyadh.

Rennes reinvigorates VAL Concept; France

20 Sep. 2018

Siemens VAL (Véhicule Automatique Léger) *CITYVAL* Metro Car for Rubber Tired Light Metro for running on Guideway

FRANCE: A spacious interior tailored to short hops is at the heart of the **Cityval Metro Car** being supplied to operate Line B of the automated **Light Metro** network in Rennes.

On display at the InnoTrans trade show in Berlin, the two-section Cityval car is one of 25 vehicles being supplied by Siemens as part of its turnkey contract for the development of Line B awarded in 2010. Line B will be 12·6 km long, running from Mermoz in the southwest to Champs Blancs in the northeast with 15 stations. It is planned to open in 2020, complementing Line A which opened in 2002 and also uses Siemens' VAL technology.

The Cityval vehicle marks a significant update to the VAL automated light metro concept, which dates back to the opening of the world's first driverless metro in Lille in the early

1980s. It has since found favour in lower-density cities and in the airport peoplemover market.

Rennes municipality has worked with French consultancy RCP Design Global to develop a specification for the Line B trainsets which meets its specific needs as a city, while also enabling Siemens to reinvigorate the VAL family. Since the order for Rennes was placed, Siemens has won follow-on orders from Bangkok and Frankfurt airport for the Cityval design.

Cityval is characterised by large windows and an abundance of standing space; RCP has developed folding seats that can also be used as perches. RCP also sought to develop an uncluttered interior making as much use as possible of the vehicle bodyshell rather than internal partitions.

Welding joins are not visible, and a walk-through gangway between the two sections is provided; this has been decorated in a bright green colour, updating the green livery used across Rennes' public transport services. The doors are wider and the tyres larger than on previous VAL designs, RCP says.

RCP Founder Régine Charvet-Pello says that the VAL 'absolutely cannot be compared' to other modes such as trams however. 'The tram is embedded in the cityscape', she says, while 'a VAL is much more like a private vehicle. It is a form of mass transit which at the same time is also pleasant, secure and comfortable.'

The consultancy has worked extensively on the aesthetic, sensory and engineering design of urban and suburban rail networks in France. It is currently involved in developing design specifications for the Grand Paris Express automated metro network in Ile-de-France and working on metro renewal projects in Lyon and Marseille.

Véhicule Automatique Léger (automatic light vehicle), or **VAL** is a type of automatic rubber-tyred people mover technology, based on an invention by Professor Robert Gabillard from the *Université Lille Nord de France*. It was designed in the early 1980s by Matra and first used for the then-new Lille Metro system. This was one of the world's first fully automated driverless mass-transit rail networks to serve a city centre (preceded only by the Port Island Line in Kobe, Japan), and the first such in Europe.

Lille Rubber tired Light Metro on Guideway

The acronym was originally for *Villeneuve d'Ascq à Lille* (Villeneuve d'Ascq to Lille), the route of the first line to be projected (and inaugurated).

In contrast to some other driverless metro systems like the Docklands Light Railway or Vancouver's SkyTrain, the VAL design uses platforms that are separated from the rollways by a glass partition, to prevent waiting passengers from straying or falling onto the rollways. Platform screen doors – produced by Swiss glass door manufacturer Kaba Gilgen AG – are embedded in these partitions and open in synchrony with the train doors when a train stops at the platform. The original platform-edge doors were manufactured and installed by PLC Peters in Hayes, Middlesex and were used on the first line.

In addition to the trains being driverless, the station platforms are unstaffed in normal operation. In the original Lille metro system, they are monitored by a large closed-circuit television system with 330 cameras and 24 television monitors in a remote control room.

Technology

The VAL system uses a fully automated elevated guideway, which may be metal or concrete depending on prevailing weather conditions. Primary suspension is by rubber tires, with pairs of horizontal tires to provide lateral guidance. Electrical power at 750 V DC is collected by shoes from the guidebars.[3]

The vehicles are lightweight 2-car sets (VAL 206) with 124 total capacity, or twin sets (VAL 256) with 80 seated and 160 standing capacity. All axles on these vehicles are motored with 150 kW electrical motors. The system detects the location of trains on the guideway by the use of ultrasonic sensors.

VAL can cope with unanticipated demand by inserting additional trains into the network as required by remote command from the control center. The control center computer system automatically speeds up or slows down trains in order to maintain a timetable. The VAL system can handle headways as small as 60 seconds, and the Lille VAL system rapidly proved itself with a 99.8% availability.

Canberra Metro Light Rail Services up and running; Australia

Apr. 23, 2019
Written by Mark Carter

REVENUE services on the 12 **km Canberra Metro Lght Rail Line** in the Australian Capital Territory (ACT) commenced on April 22, preceded by three days of free community events leading up to the official start of services. Around 25,000 people were carried during an eight-hour period on April 20.

Media reports suggest that the overall construction cost is expected to be lower than the $A 707m ($US 503m) set out in the project's business case, which had already been revised down from a previous estimate of $A 783m.

The project has been delivered through a public-private partnership (PPP) between the ACT government and the Canberra Metro consortium, which includes construction and operation of stage one of the network for 20 years. Operation and maintenance will be provided by UGL and John Holland in partnership with DB Engineering & Consulting.

The line links the northern suburban centre of Gungahlin with Canberra city centre, with services provided by 14 CAF Urbos 3 LRVs powered by 750V dc overhead electrification.

The ACT government is offering free travel on all services for one month from April 29 to coincide with the launch of Canberra's new integrated public transport network.

Planning and work on environmental approvals for the Stage 2 extension to Woden are continuing, though no specific timeline for financing and construction has been announced.

METRO NEWSLETTERS
on
URBAN MOBILITY

Special Edition on: How Digitalization is evolving intelligent Rail Infrastructure - Trends and Solutions for tomorrow's connected Rail Transportation

White Paper by Siemens; siemens.com/mobility

METRO Newsletter by Dr. F.A. Wingler
METRO 61, April 2019

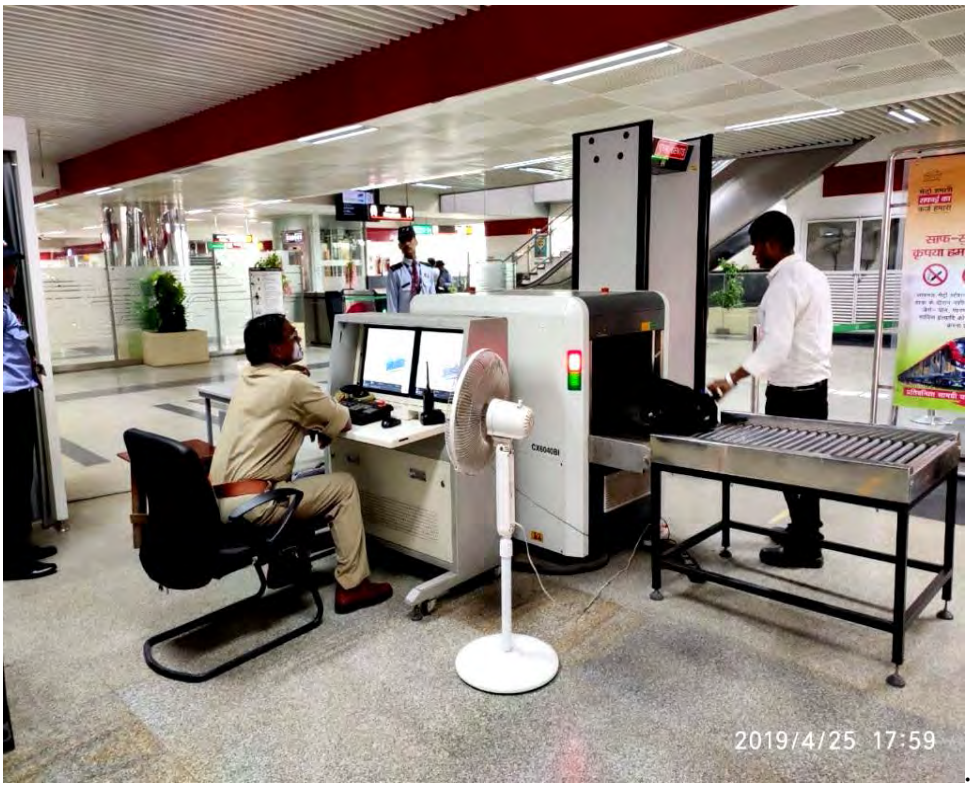
Gornergrat Bahn in Switzerland is already operating its Control Technology in the Cloud

METRO NEWSLETTERS
on
URBAN MOBILITY AS A SERVICE

PUBLIC MULTIMODAL URBAN, SUBURBAN AND INTERURBAN PASSENGER TRANSIT SYSTEMS WITH METRO-BUS, LIGHT-RAIL, TRAM-TRAIN, METRO-RAIL, LIGHT METRO-RAIL, METRO-TRAIN, REGIONAL RAPID TRANSIT, COMMUTER-RAIL, RUBBER WHEEL METRO ON GUIDEWAY, ROPE-WAY/TRAIN, LINEAR INDUCTIVE MOTOR, MAGLEV AND HOVERCRAFT TRANSIT/PEOPLE MOVER, WATER-METRO, AUTONOMOUS PEOPLE-MOVER

TRANSPORTATION AND ECONOMIC DEVELOPMENTS IN MODERN URBAN/MEGAPOLIS ENVIROMENT

METRO Newsletter by Dr. F.A. Wingler
METRO 63, May 2019



Security Check Technology for Lucknow Metro; India

PART I: ACTIVITIES FOR URBAN MOBILITY AS A SERVICE IN INDIA

Exclusive Content: Potential Use of Artificial Intelligence for Railway and Metros in India; India

March 18, 2019 Articles

In the modern day, computers, electronic gadgets internet, Wi-Fi, online services, social media, e-learning and alike have attained immense popularity. Almost everyone is glued to the screens of their smartphones, tabs, and laptops; either studying, playing games, connecting with friends on social media or busy in some work. Gadgets and quick learning have become part of our day-to-day lives. Addition to this is the machine learning that has been incorporated in various spheres. Machine learning plays a prominent role in simplifying the tasks that are humanly impossible or time-consuming. The Artificial Intelligence (AI) system gives Predictive measures.

What is Artificial Intelligence?

Artificial intelligence is the study where computers are made to think the way human brains work. For example, if the user searches on the web, the advertisers follow the user on every connected social media accounts or web page that they scroll. Ever witnessed this while working on various platforms in the World of machine learning? If yes, then this Artificial intelligence.

Utilization of Artificial Intelligence in Railways:

Indian Railway is the fourth largest network in the World. Managing railways have always been a tough task for the management and Indian Government; as it needed some assistance in the operations. The introduction of Artificial Intelligence has been an elixir to the railways and the passengers using the services of railways. Artificial Intelligence has provided relief in operational delays and innovations in the customer experience and service delivery. Many Original Equipment Manufacturers (OEMs) are now investing significant resources into one of the most valuable and potentially rewarding currencies in business: big data.

Condition Based Management vs. Predictive Managemen:t

Railways have various things that needed keen observation and maintenance; like rolling stock maintenance, big data is synonymous with Condition Based Management (CBM) and Predictive Management (PM). Rapidly expanding scale of manufacturing and asset management industry is the reason why adapting to the wider applications of advanced algorithms have become essential.

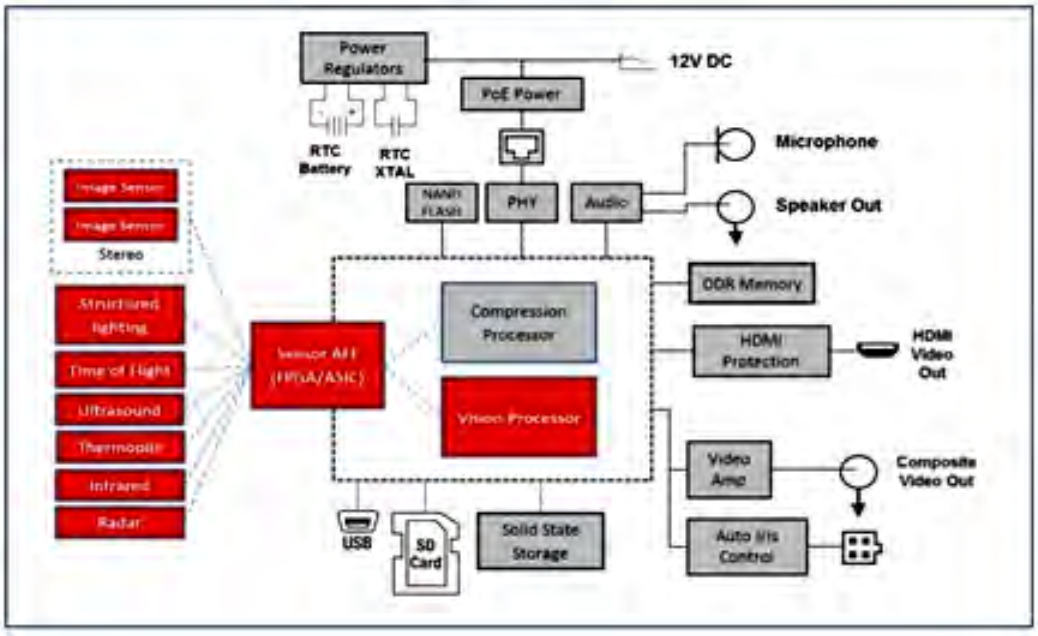


Image Credit: embedded-vision.com

Rapidly expanding scale of manufacturing and asset management industry is the reason why adapting to the wider applications of advanced algorithms have become essential. of

trains, analysis of root causes of the failures caused by system dis-functioning can be detected and repaired timely.

AI is the Future:
Application in Signalling is a field that the AI can be utilized and is being assessed . The signalling system has witnessed a marvellous change in auditing of trains that have suffered breakdowns or damages due to train collisions root cause being fault in track clearance and movement. The delays in signalling of trains have been reduced; which in turn have assisted in decreasing the delays in arrival and departure of trains.
As a result, comprehensive supervision is possible and auditing of root causes due to failure in systems can be rectified at the earliest.

Recently held World's largest religious fest Ardh Kumbh Mela, Prayagraj from January 2019 to March 2019, which witnessed around 100 million devotees. Railway deployed machine learning systems to control the crowd of devotees, that is impossible humanly or time consuming.

Artificial Intelligence has marked its success as it managed the crowd in simplified ways connecting the real life instances with technical brains to bring out the best output. Unlike previous Kumbh Melas held in the history , this is considered as one of the best religious event organized in India ever.

Utilization of Artificial Intelligence in Metros:

The process of restructuring the railway, metros and aerospace is known as interlinking the technical brains with human brains.

The first ever metro of India was built in Kolkata, it had its share of pros and cons. It was a relief to daily commuters but the facilities came with some clause. The metros were built on the lines of traditional railway functioning systems. However, the Delhi Metro was a game changer as it came with all the latest technologies introduced in every department of DMRC (Delhi Metro Rail Corporation).

The Delhi Metro was able to come with the latest Artificial intelligence amenities on account of the DMRC project being co-funded by renowned Delhi Government and Union Government of India.

Starting from the ticketing system- tokens and smart cards, the provision of vending machines that allows the users to operate the machines get their tickets or tokens and

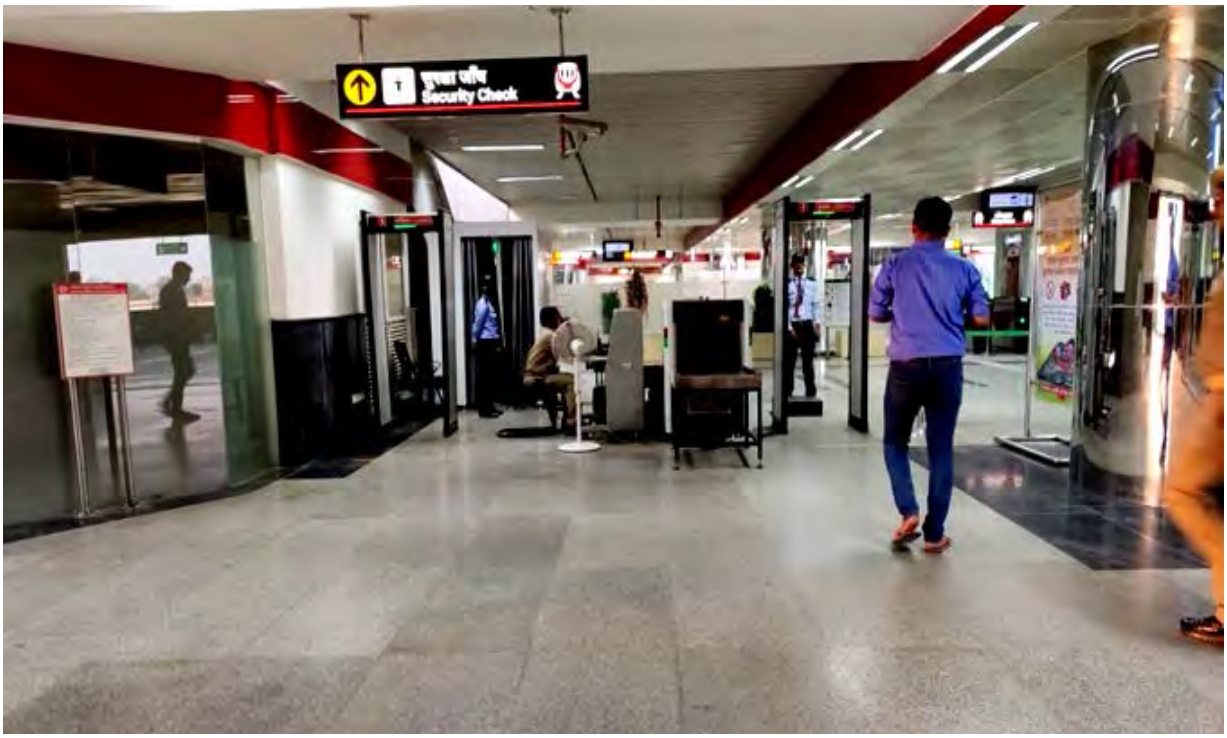
recharge smart cards for their journey inside the DMRC premises. The machine learns what the user wants to do with AI assistance and make the travel easier for them. The automated systems for opening and closing of the doors of the metro and at the metro platforms are also backed by AI technology.

The geo positioning of DMRC metro trains are making trips minute after minute, delays are curbed. Artificial intelligence has made the process of metro simpler not only for commuters but also for the executives working at DMRC.

Hence, Artificial Intelligence is making its inroads in all industries and the opportunity in Railways is huge !

Lucknow Metro equipped with advanced Methods and Techniques to ensure utmost Security of Passengers; India

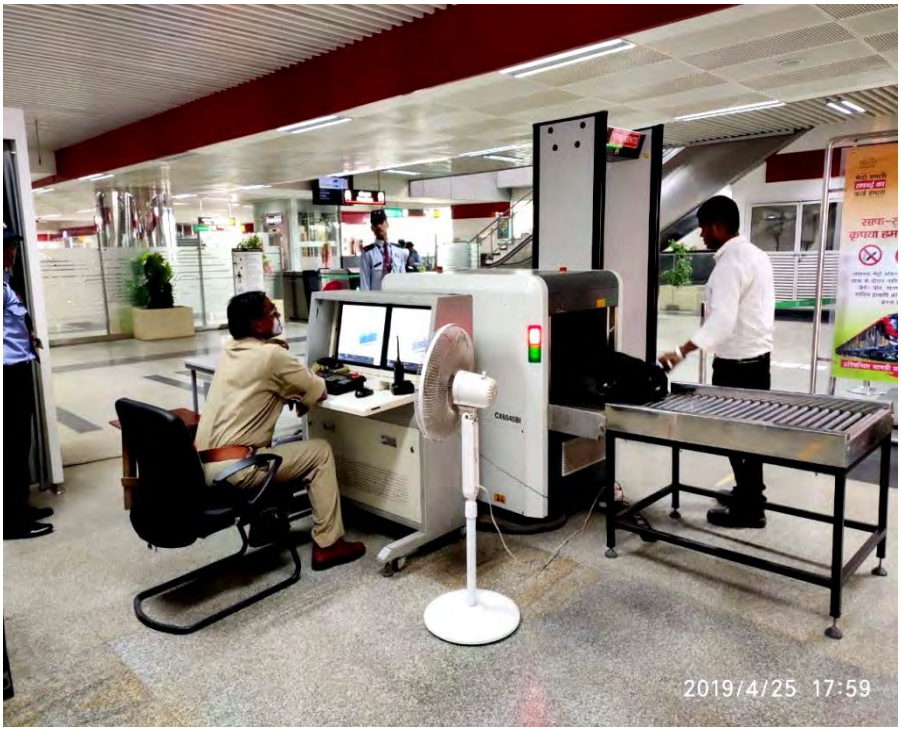
April 26, 2019 Press Release



Keeping in mind the convenience and comfort of the Lucknowites, LMRC is not only providing extremely suave means of mass rapid transport, but is also equipped with the finest security equipment where no suspicious activity or person can remain untouched by the Metro security system.

One such mechanism in place is the X-BIS (X-RAY Baggage Inspection System) which not only detects dangerous objects but also checks the alertness of the security personnel.Lucknow Metro Rail Corporation (LMRC) has used such systems for security

checks on its metro stations, which not only detects the smallest suspicious object but also ensure that the security personnel posted on duty is fully prepared or not.



This is done through Threat Image Protection (TIP), a software used to detect the alertness of the security personnel. This software periodically generates a false image of dangerous or suspicious objects (such as a gun or knife, etc.) without any prescribed patterns, and the security personnel sitting on the inspection machine will have to click on the image to make sure that the image of that dubious material is scanned properly. If this image is ignored by the security personnel, then it gets recorded and reports are generated for such lapses at regular intervals.

X-BIS Systems are Emergency ready

The X-BIS Machines are capable of detecting metals as thin as 35mm and are prepared to provide a backup of half an hour in case the power supply goes off. Moreover, the images of the scanned luggage are stored in the feed machine and if the information of any previous event is required then the respective image can be taken from the machine. These machines can store up to 50 thousand images and can also check 300 bags in one hour.

9 Zone Door Frame Detector leaves no Scope for Lapse

Door Frame Metal Detectors (DFMD) engaged in security checks at all the stations of the Lucknow Metro and examine the person standing inside the frame in such a way that he cannot hide any prohibited items in any part of the body. To ensure this, 9 zones have been created in DFMD, of which there are 3-3 zones on both sides of the machine and 3 zones in the middle. With the help of these zones, every part of the body is thoroughly tested.

Public Relations Department
Lucknow Metro Rail Corporation Ltd.

Nagpur Metro Deploys DAMM TetraFlex Radio Communication Solution; India

01 May 2019 | Railway News

Maha Metro Rail Corporation has deployed a DAMM TetraFlex® radio solution for its flagship Nagpur Metro Rail project. The solution is provided for a total of 37 stations and two depots, as well as onboard equipment for 23 three-car trains.

Nagpur Metro is a rapid transit system for the city of Nagpur, India. It is estimated at a cost of 1.18 billion USD. Nagpur Metro Phase 1 comprises of North-South and East-West corridors totalling 37 km. The first section, covering a distance of 13.5 km from Khapri to Sitabuldi stations, is now operational, with Narendra Modi, Prime Minister of India, performing the inauguration on 8 March 2019.

The major benefits of the DAMM TetraFlex radio solution for the Nagpur Metro is its decentralized architecture, which ensures that there is no dependency on a central switching equipment for section-wise commissioning and operation of the radio system.

Because the DAMM TetraFlex solution is based on an open ETSI standard, Maha Metro Rail Corporation is also free to choose the devices that best suit its needs rather than being limited to particular brands and models. Through DAMM's flexible Application Programming Interface it is easy to integrate to other telecom systems such as telephony, external radio network and central voice recording systems. Another benefit is that the solution provides integration to signalling systems.

Superior Technology and strong Partnerships

Consort Digital, regional partner for DAMM Cellular Systems and an established TETRA system integrator, will be responsible for the delivery, project management and execution of the project.

Carsten Laursen, Regional Director at DAMM, said:

'Nagpur Metro is a really exciting project for us.'

'Once again we have proved the superior quality and flexibility of our solution in the rail industry. With the professional work provided by Consort Digital we have also yet again demonstrated the strength of our systems partner network, which is core to our business.'

About Consort Digital

Consort Digital is a reputed system integrator, deploying mission- and business-critical voice and data solutions for professional users. Consort Digital specializes in designing, provisioning and supporting state-of-the-art **radio communication solutions for mass transit** customers such as mainline rail, metros, light rail and monorails.

About DAMM

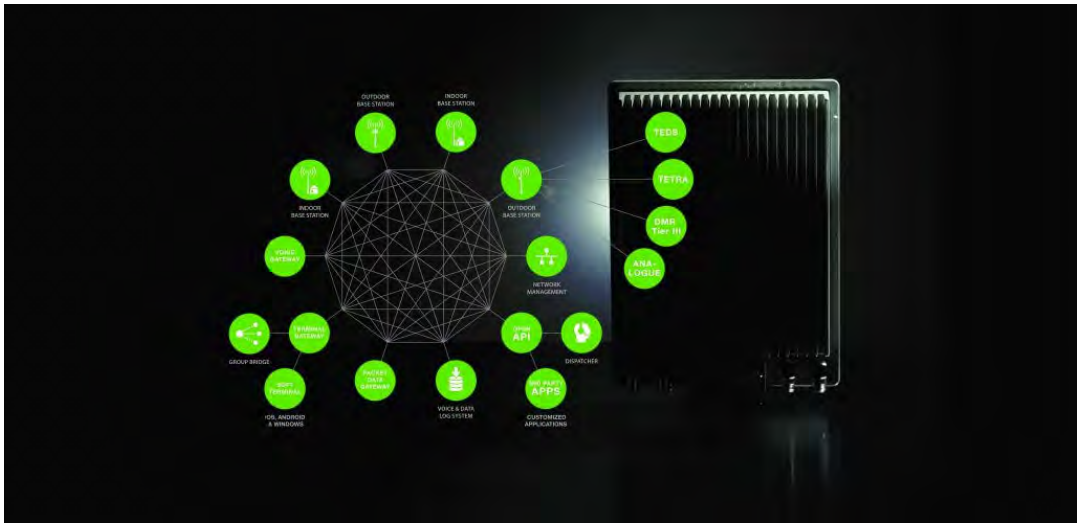
DAMM is a world-leading provider of scalable, flexible and user-friendly digital radio infrastructure systems to industrial, commercial and public safety customers. Built for the future of critical communications, the DAMM MultiTech Platform enables voice and data communication across technologies, including TETRA, TEDS, DMR and Analog in one single system. With over 35 years of experience in critical radio and broadband communication, DAMM takes the lead through superior engineering and a constant focus on customer needs and reduced complexity.

Communication Systems for Rail and Metro

DAMM is a world-leading provider of communication systems for rail and metro, supplying flexible and user-friendly digital radio infrastructure systems to industrial, commercial and public safety customers. Being a key player for more than 30 years within professional radio communication, DAMM is taking the lead through superior engineering and constant focus on customer needs and reduced complexity.

TetraFlex® System

DAMM's TetraFlex® system offers a full solution and features intelligent, distributed network architecture, built-in applications and gateways for full asset management, and the freedom to choose any terminal brand. Our portfolio includes the DAMM TetraFlex® PTT mobile app utilizing WiFi or LTE on your iOS, Android or Windows device.



DAMM Multi-Tech Platform

NEW DAMM Multi-Tech Platform for Rail and Metro

Built for the future of critical communications, the DAMM Multi-Tech Platform enables voice and data communication across technologies, including TETRA, TEDS, DMR and Analog in one fully integrated system. The new BS422 is the world's first outdoor base station featuring these 4 technologies in one box. With a simple click in the software, the BS422 can be set to run in any technology mode, or even multiple of these. One application, in one single interface covering all technologies. DAMM Multi-Tech Platform is ideal to meet the challenges in the rail and metro industry:

- **Meet the need for more data** by using TEDS for train control, or pushing data to the train information system, still within the same secure and independent communication platform.

- **Reduce number of base stations and extending track-side coverage** utilizing VHF in remote areas and high power output. Options include 25W TETRA and/or 50W DMR .

- **Save installation and operation costs** with a rugged, compact outdoor base station ideal for track-side installations. The BS422 is mast mountable direct at track-side due to EN 50128 approval. The BS422 offers best-in-class power

consumption, lowering operational costs and enabling alternatives for energy supply, like solar power.

- **Easy remote management with one application for all technologies.** Full remote manageable base stations across technologies, in hybrid operation, eliminating the need for on-site service, and making it ideal for remote sites.

- **Improved Tunnel coverage**, Improved node synchronisation, eliminating the need for GPS coverage by utilizing IEEE 1588 for node synchronisation. Alternatively use the simulcast option of the BS422; same network management platform, full output power and sensitivity.

Multiple Communication Technologies in One Box

DAMM offers a technology independent solution covering your needs of today and tomorrow. Featuring Multi-Technology and Multi-Frequency, as well as Multi-Carrier and Simulcast all in one box, you can stay dynamic and flexible with the DAMM Multi-Tech Platform. These BS422 highlights include:

- **Multi-Technology** presenting the world's first outdoor base station featuring 4 technologies in one box; TETRA, DMR Tier III, TEDS and Analog

- **Multi-Frequency** extending coverage by supporting VHF and UHF mode in all technologies

- **Multi-Carrier** providing a flexible, cost-efficient solution by enabling up to 4 carriers in one box, and even combining multiple technologies in one box

- **Simulcast** available for DMR and Analog, and now also offering repeater functionality for TETRA and TEDS

Digital Communication Integration for Railway Operations

Through the cooperation with leading rail and metro providers worldwide, DAMM understands the critical importance of communications within transport infrastructures. DAMM's TetraFlex® solution delivers high-performance digital TETRA voice and data communications providing crucial communications integration across railway operations, enhancing efficiency and safety as well as the satisfaction of personnel and passengers.

TETRA: Proven Global Technology

TETRA (terrestrial trunked radio) was developed by ETSI, the European Telecommunications Standards Institute. TETRA technology is currently being used in thousands of mission-critical applications across more than 160 countries, and has proven its value in countless rail and metro applications as being superior to GSMR.

Optimized Installation for Rail and Metro

The IP65 encapsulated and ruggedised outdoor base station has been optimized for use within rail and metro operations. With its compact size, it is ideal for use in the harsh environments of metro tunnels or direct outdoor mounting. DAMM demonstrate best-in-class power consumption, combined with no need for housing or air conditioning, this gives significant saving both on installation as well as operation.

Mumbai Monorail

The Crowd in Metro Moscow

Complete Communication Coverage, Scalability & Reliability

The fully IP-based technology used by DAMM TetraFlex® digital voice and data communications solutions makes it possible to create integrated communications across multiple stations, logistics facilities, depots, maintenance facilities and centralized operational control centres. It also means that the system can support any capacity, from single-site stations to large railway and metro infrastructures with thousands of users. Up to 16 carriers per node, allowing for 63 time slots, or up to 4 control channels to secure SDS traffic and position reports.

100% uptime through full redundancy as well as by the system's intelligent distributed network architecture. All information is constantly replicated to all sites in the network, allowing call and data traffic to continue uninterrupted if one or more sites lose connection with the rest of the network.

Intuitive User Coordination

User-defined groups and staff teams can easily be defined and coordinated. The highly flexible voice communication services support individual private calls, group calls, telephony communications (PSTN) and other features.

Data Communications for Data Applications

DAMM TetraFlex® data services provide data for i.e. vehicle-tracking systems, timetable and journey information, signaling control or SCADA and telemetry data, supporting third party applications, such as vehicle management systems.The advanced management of Packet Data channels enables reliable and deterministic bandwidth for data applications.

Integrated Applications for increased Operational Performance

DAMM TetraFlex® comes complete with integrated applications. With the intuitive DAMM TetraFlex® dispatcher solution all users can easily be dispatched by the operational centres. DAMM TetraFlex® also provides a complete voice/data recording and replay facility, enabling effortless incident reconstructions and gathering valuable statistics on operational performance.

TETRA for Wifi Applications

DAMM offers TetraFlex® Android Client, iOS and TetraFlex® Windows Client – a vendor independent soft terminal, fulfilling the needs for non-critical voice & data communication operating through WiFi, UMTS(3G) and LTE(4G) networks.

TetraFlex® Network Management

Communication Technology for Customer-Designed Applications

DAMM TetraFlex® is supplied with an easily accessible Application Programming Interface (API) that allows straightforward development and integration of customer-designed applications.

Key DAMM Features for Rail and Metro Communications

- IP65 protected housing for direct installation in harsh environments
- Compact design
- Easy and quick scalability without interruption of operation

- Reliability: redundancy, back-ups and no single point of failure
- Best-in-class power consumption
- Free choice of terminal suppliers
- Easily accessible API for easy integration into third party systems
- High cost effectiveness
- Full public/private LTE connectivity – or use your own WiFi system

Contact Details:

Damm Cellular Systems A/S, Møllegade 68, DK-6400, Sønderborg

TEL: +45 7442 3500

PART II: ACTIVITIES FOR URBAN MOBILITY AS A SERVICE; INTERNATIONAL

Public Transportation in Portland, an international Pioneer in integrated and multimodal Transit orientated Developments, Oregon; USA

From Wikipedia, the free encyclopedia

Freemont Bridge across the Columbia River, a critical Piece of Portland's Transportation Infrastructure

Like transportation in the rest of the United States, the primary mode of local **transportation in Portland, Oregon** is the automobile. The Metro has a regional master plan in which transit-oriented development plays a major role. This approach, part of the new urbanism, promotes mixed-use and high-density development around light rail stops and transit centers, and the investment of the metropolitan area's share of federal tax dollars into multiple modes of transportation. In the United States, this focus is atypical in an era when automobile use led many areas to neglect their core cities in favor of development along interstate highways, in suburbs, and satellite cities.

Mass Transit

Portland has a public transportation system. The bus and rail system is operated by **TriMet,** its name reflecting the three metropolitan area counties it serves (Multnomah, Clackamas, and Washington). Portland's rate of public transit use (12.6% of commutes in 2008) is comparable to much larger cities like Los Angeles, and higher than in most similarly sized U.S. cities, but is lower than in some others, such as Baltimore and Seattle. Transit service between Portland and Vancouver, Washington, the second-largest city in the metropolitan area, is provided by C-Tran, with a small number of express routes.

Buses and Bikes, Downtown Portland in Motion

Within the downtown area (the city center) is the Portland Transit Mall, a transit-priority corridor on which **Buses and Light Rail Trains** from many different parts of the region converge. First opened in 1977, and for three decades served only by buses, the transit mall underwent major changes in 2009. Tracks for light rail (MAX) were added, bus stops spaced farther apart, and the left lane opened to general traffic (but with right turns prohibited). To facilitate this major renovation and rebuilding, lasting more than two years, all bus routes using the mall were diverted to other streets (mainly 3rd and 4th avenues) starting in January 2007. The transit mall reopened to buses on May 24, 2009, and operator training runs on the new light-rail tracks took place during the late spring and summer. **Light Rail Service** on the transit mall was introduced on August 30, 2009, when the MAX Yellow Line moved to the mall from its previous routing. The new MAX Green Line opened 13 days later, on September 12, and it also serves the downtown transit mall.

From 1975 to 2010, all of downtown Portland was in Fareless Square, a fare zone within which all rides on **Buses, Light rail and Streetcars** were fare-free, and starting in 2001 this zone also covered a portion of the adjacent Lloyd District. In 2010, free rides became limited to light-rail and streetcar service – no longer covering bus service – and the zone was renamed the "Free Rail Zone".[11] In September 2012, the fareless zone was discontinued entirely, due to a $12 million shortfall in TriMet's annual budget.

Ben Holladay was the first person to offer public transportation to the city of Portland when in 1872 he opened the Portland Street Railway Company, a horsecar line on First Street extending to a garage at the end of Glisan. In 1882, a second horsecar system was built for Third Street. Ferries such as the O&CRR Ferry#2 were used to cross the Willamette River before the construction of the first Steel Bridge in 1888. At that point, rail expanded into Albina and East Portland. Horsecars took passengers across the river and steam trains took them further into the suburbs, but both modes were soon replaced by electric streetcar lines, the first of which began operation on November 1, 1889, between St. Johns and Portland.

Buses

TriMet operates a fleet of 610 buses on a network of 80 bus routes. Twelve of the routes are designated "Frequent Service" bus routes, with more frequent schedules than other routes. Originally intended to have buses scheduled every 15 minutes or less all day, every day (including weekends and holidays), budget cutbacks in 2009 caused TriMet to change "Frequent Service" routes to have 15-minute-or-less wait times only during weekday peak usage times in the morning and afternoon.[19] In August 2014, TriMet reintroduced 15-minutes-or-less wait times at all times during weekdays on Frequent Service routes, with the stated goal of reinstating weekend 15-minutes-or-less wait times on these routes.

Portland TriMet Bus Service

TriMet's bus fleet is made up of 30' and 40' buses, built in 1997 or later, and nearly all are low-floor buses, with only a small number of older high-floor models (built in 1997) still in service at the end of 2015. The last non-air-conditioned buses were retired in December 2015. In 2012, TriMet reinstated its annual bus purchase program and will have only low-floor buses in rotation by 2017.

TriMet's bus routes also include express buses from downtown Portland to South Beaverton, Sherwood and Oregon City, and express buses from Marquam Hill to Beaverton, Tigard, Southwest Portland, and Milwaukie. TriMet also has several "cross-town" routes that do not serve downtown Portland. The bus network operates predominately in a hub-and-spoke network starting with the downtown Portland transit mall, and includes outlying transit centers in Portland's suburbs.

In addition to the fixed-route service, TriMet operates a paratransit service known as LIFT which operates 254 minibuses and 15 sedans offering door-to-door service for citizens who cannot access regular TriMet services.

Metro and Light Rail in Portland

Since 2009, the Portland Transit Mall has been used by both MAX and buses.

Since September 2015, Portland's light rail system, named *MAX* (short for Metropolitan Area Express), consists of five color-coded lines:

- The Blue Line is a 33-mile (53 km) east-west route. It begins in Hillsboro, a western suburb, passes through Beaverton and downtown Portland, then across the Willamette River, through Northeast Portland and east to the city of Gresham. The 15-mile (24 km) line between downtown and Gresham was the first light rail line opened in Portland, in 1986. MAX lines first became designated by colors in 2000.
- The Red Line incorporates a 5.6-mile (9.0 km) north-south addition between the airport and the Gateway Transit Center near the northeast Portland neighborhood of Parkrose. From that point the line overlaps the Blue Line, running west to downtown and beyond, terminating at the Beaverton Transit Center, where it and the Blue Line meet WES Commuter Rail.
- The Yellow Line added 5.8 miles (9.3 km) to the system. It connects North Portland's Expo Center with downtown. This line is often referred to as "Interstate MAX" because much of it runs along Interstate Avenue, and parallel to I-5. Until 2009, the Yellow Line followed the same mostly east-west alignment through downtown Portland as used by the Blue and Red lines, traveling along Morrison Street (westbound) and Yamhill Street (eastbound) through the core of the business district. However, on August 30, 2009, the Yellow Line shifted to a new north-south alignment through downtown that had been constructed along the Portland Mall (see Green Line). In 2015, the Yellow Line became through-routed at all times with the then-new Orange Line (see below).
- The Green Line runs from Clackamas Town Center, in the Clackamas area, north along I-205 for 6.5 miles (10.5 km) to the Gateway Transit Center, where the Blue and Red Lines meet. From Gateway, it joins them and travels westwards to downtown Portland along the 1986-opened tracks extending to the Steel Bridge. From there—a new junction on the bridge's west deck—the Green Line uses 1.8

miles (2.9 km) of new tracks passing Union Station and running mainly along the transit mall for the remainder of its route through downtown, sharing that routing with the Yellow Line (and since 2015 the Orange Line) and terminating at Portland State University (PSU).

- The Orange Line added 7.3 miles (11.7 km) of newly constructed line, extending from the south end of the Portland Mall to Milwaukie. The project included construction of the Tilikum Crossing, the first new bridge opened across the Willamette River in Portland in 42 years (since 1973), which is also notable for being open only to transit vehicles, pedestrians and cyclists—and not private vehicles.[23][24] From the PSU area in downtown, the Orange Line follows streets and a bus-and-light-rail-only viaduct to reach the South Waterfront district. After crossing the river, the line turns southward, passing through Southeast Portland along a new median on SE 17th Avenue and then mostly along or adjacent to previously existing railroad rights-of-way to downtown Milwaukie. The terminal station is at Park Avenue, just south of downtown Milwaukie. Operationally, it is linked to the Yellow Line at all times; southbound Yellow Line trains become Orange Line trains when they depart from Rose Quarter TC, and northbound Orange Line trains become Yellow Line trains when they reach the transit mall in downtown Portland.

Portland Streetcar

Portland Streetcar

The Portland Streetcar is a two-line streetcar system serving the central part of Portland—downtown and the areas immediately surrounding downtown. The system's first line opened in 2001 and, with later extensions, now follows a 3.9-mile (6.3 km) route from Legacy Good Samaritan Medical Center at NW 23rd Avenue through inner-Northwest and Southwest, including the Pearl District and Portland State University, to the new South Waterfront neighborhood, where it connects to the Portland Aerial Tram. In 2012, this route was given the designation North-South Line, or NS Line.

The system's second line opened in 2012 and extended service across the Willamette River to the Lloyd District and the Central Eastside. The federal share of funding for this

$148-million project, a 3.3-mile (5.3 km) extension and fleet expansion,[27] was approved in April 2009, and construction began in August 2009. Originally named the Central Loop Line, or CL Line, it was renamed the A Loop (clockwise) and B Loop (counterclockwise) in 2015, when it was extended from the eastside across the Tilikum Crossing bridge and also along the NS Line from South Waterfront to Portland State University. See Portland Streetcar (Eastside line) and Loop Service (Portland Streetcar) for more detail.

The Willamette Shore Trolley is a seasonal, volunteer-operated heritage streetcar service established in 1990 – after a 1987 trial run – for the purpose of preserving an approximately 6-mile (10 km) former Southern Pacific railroad right-of-way running south from Portland to Lake Oswego for possible future transit use. Plans to extend the Portland Streetcar along the right-of-way were mothballed in early 2012, but remain under consideration for the long term. The right-of-way was acquired by a consortium of local governmental entities in 1988 for this purpose.

Commuter Rail

Portland Commuter Rail Talgo Trainset

TriMet's WES Commuter Rail connects the cities of Wilsonville, Tualatin, Tigard and Beaverton. It is one of only three suburb-to-suburb commuter rail lines in the country,[along with Tri-Rail in Miami and the Inland Empire-Orange County Line operated by Metrolink between San Bernardino and Oceanside, Calif. Rather than electric railcars like those of MAX, the line uses FRA-compliant diesel multiple units running on existing Portland and Western Railroad freight tracks. The first rides open to the general public took place on Friday, January 30, 2009, and regular service began on Monday, February 2, 2009.

Amtrak also exists as a rail commuting option in the Portland area with the Amtrak Cascades providing daily service between Portland and neighboring Oregon City.[32] While the frequency is less than that of TriMet, the 20-minute ride from Oregon City is faster, has cheaper tickets, and is arguably a more comfortable service.

See the Intercity service section below for information about the many intercity bus and train services to and from Portland from outside the metro area.

Portland Aerial Tram; Ropeway

Portland Aerial Tram Car descends towards the rising South Waterfront District.

The Portland Aerial Tram is an aerial cableway used to connect the South Waterfront district with Oregon Health and Science University on Marquam Hill above. The cableway is two-thirds of one mile (1 km) long and was opened to the public in January 2007.

Portland, OR Public Transportation Statistics

The average amount of time people spend commuting with public transit in Portland, OR, for example to and from work, on a weekday is 90 min. 36% of public transit riders, ride for more than 2 hours every day. The average amount of time people wait at a stop or station for public transit is 14 min, while 21% of riders wait for over 20 minutes on average every day. The average distance people usually ride in a single trip with public transit is 8.2 km, while 18% travel for over 12 km in a single direction.

Cycling

Bicycle use in Portland has been growing rapidly, having nearly tripled since 2001; for example, daily bicycle traffic on four of the Willamette River bridges has increased from 2,855 before 1992 to over 16,000 in 2008, partly due to improved facilities. Approximately 8% of commuters bike to work in Portland, the highest proportion of any major U.S. city and about 10 times the national average. By July 2016 through a 4-0 city council vote, Portland will have a bike share program running with 600 bikes. The new bikes will be provided by Social Bicycles, and will be operated by Motivate.

Cycling in Portland

Karlsruhe breaks Ground on Light Rail Tram-Train Extension; Germany

Apr. 29, 2019
Written by Keith Barrow

A groundbreaking ceremony was held at Egon-Eiermann-Allee in Karlsruhe on April 29 to officially launch construction on the 1.5 km extension of tram Line 2 from Lassallestrasse to the Knielingen 2.0 residential development in the northwest of the city.

The current Line 2 Terminus at Lassallestrasse.

The double-track extension, which includes new barrier-free stations at Sudetenstrasse, Pionierstrasse, Egon-Eiermann-Allee and Knielingen North, is due to open at the end of 2020.

The €14m project is being funded with the aid of a €6.1m grant from the federal government, which was awarded to the state of Baden-Württemberg through the State Transport Financing Act (LGVFG).

Categories: Light RailNews
Tags: BadenWürttembergGermanyKarlsruhe

Aarhus Letbane Light Rail Phase 1 completed; Denmark

30 Apr. 2019

DENMARK: The first phase of the Aarhus Letbane light rail network was completed with the entry into service of the last sections on April 30.

The 69 km single-track railway between Aarhus H and Grenna to the northeast has reopened as a light rail line having been closed since 2016 for modernisation including electrification; 14 stations were refurbished.

Services operate between 05.14 and 23.14, running every 30 min between Aarhus H and Ryomgaard. Every other service continues to Grenaa, and there are plans to run every train to the end of the route. The journey time from Aarhus H to Grenaa is 73 min.

The new-build tram part of the network has also been completed with the opening of the 5 km Lisbjerg – Lystrup section. The first part of this was opened on December 21 2017 between Aarhus H and Universitetshospitalet, followed by an extension from Universitetshospitalet to Lisbjergskolen on August 25 2018.

August 2018 also saw the inauguration of the 29 km southern light rail route between Aarhus H and Odder.

Construction of the network began in June 2013 and was undertaken by a consortium of Stadler and Ansaldo STS. Stadler has supplied 12 three-section Tango tram-trains to operate Odder – Grenaa services and 14 low-floor Variobahn trams for the tram section in the city centre.

Related news

- 28 Aug 2018 - First phase of Aarhus tram-train route inaugurated
- 21 Dec 2017 - Aarhus opens Denmark's first modern light rail line
- 04 Jul 2014 - Aarhus selects light rail contractors
- 21 Sep 2013 - Feature articles in the September 2013 issue of Metro Report International
- 10 May 2012 - Aarhus tram-train project gets the go-ahead

Second Metro Line opens in Panamá City; Panama

26 Apr. 2019

PANAMA: The second line of the Panamá City metro opened for revenue service on April 25.

Line 2 runs on an entirely elevated alignment east from an interchange with Line 1 at San Miguelito to Nuevo Tocumen via San Antonio and Hospital del Este. The 21 km route serves 16 stations with an end-to-end journey time of 35 min, compared with the 90 min that the journey previously took by road.

A groundbreaking ceremony in October 2015 marked the start of work, which was undertaken by the Línea 2 consortium of Odebrecht (60%) and FCC (40%).

E&M work was undertaken by the Grupo de Empresas consortium of Alstom, Thales, Sofratesa, CIM and TSO. Consortium leader Alstom has supplied a fleet of 21 five-car Metropolis trainsets from its Santa Perpètua de Mogoda factory near Barcelona. These are stabled at a depot in Nuevo Tocumen accessed by a 1·2 km spur from the running line. CIM subsidiary Mechan has supplied 20 lifting jacks, four turntables and 40 vehicle stands for the depot.

Alstom also supplied traction substations including a Hesop reversible substation. Alstom's Urbalis CBTC signalling is designed for 90 sec headways, giving Line 2 a design capacity of 40 000 passengers/h per direction. Thales supplied the operation control centre, SCADA systems and a TETRA radio network.

A consortium of TMB, Ayesa and Louis Berger undertook project management and technical assistance under a US$32m five-year contract, while TY Lin Engineering supported the engineering and E&M systems, and provided consultancy and design services. Local firms Plades and CSA Group assisted with utility relocation, and Mallol Arquitectos advised on urban planning issues. Station design and architecture was undertaken by Perez & Perez.

A southwestern extension of Line 2 to Parque Urracá is planned. This would add 11 stations, including an interchange with Line 1 at Iglesia del Carmen.

- A detailed feature article on the Panamá City metro appeared in the Spring 2018 issue of *Metro Report International*.

Related news

- 07 May 2018 - Panamá metro depot equipment delivery
- 04 Apr 2018 - First Panamá City metro Line 2 train shipped
- 06 Oct 2015 - Panamá City metro Line 2 breaks ground

VR Group to operate Tampere Tramway; Finland

29 Apr. 2019

FINLAND: Tampere's Municipal Public Transport Committee has selected national railway VR Group to operate the tramway being developed in the city.

Six parties prequalified for the contract: VR Group, Stockholms Spårvägar, Länsilinjat, Väinö Paunu, Go-Ahead Finland, and a consortium of Transtech and Keolis; Go-Ahead Finland subsequently withdrew its bid. VR Group, Länsilinjat and Transtech-Keolis were shortlisted.

The contract covers a 2½-year preparatory period followed by 10 years of operations, with an option to extend this by a further three years. Test running is due to take place between April 2020 and March 2021, with passenger-carrying tests following until the planned opening date of August 9 2021.

The contract is worth around €7m per year. VR is to employ 50 to 100 people in Tampere, and Tampere Tramway Alliance will act as service integrator.

VR is currently bidding to operate the Helsinki metro, with the result of the tender expected next year.

Built in two Phases

The 15 km first phase of the Tampere tramway is being built by a consortium of VR Track, Pöyry and YIT. The 1 435 mm gauge line will run eastwards from the city centre to Sampola where it will split with branches to Tampere University Hospital and south to Hervanta.

Škoda Transportation subsidiary Transtech is supplying a fleet of 19 ForCity Smart Artic trams under a €104m contract signed in 2017 that includes options for up to 46 more. These will be stabled at a depot being built at Hervanta.

Construction of the second phase is due to begin in 2021. This would extend the network west to Hiedanranta and Lentävänniemi, taking it to 23·5 km.

Related news

- 15 Oct 2018 - 'Unpretentious, authentic and pragmatic' Tampere tram styling revealed
- 16 Oct 2017 - Tampere tram order finalised
- 30 Nov 2016 - Tampere tramway construction contract signed
- 08 Nov 2016 - Tampere tram project formally approved

Test Track Complex to be built in Singapore; Singapore

24 Apr. 2019

SINGAPORE: Land Transport Authority has announced plans to build a metro train test centre on the former site of the Raffles Country Club in Tuas.

The 50 ha site near the East-West Line's Tuas West depot would include an endurance loop, a performance and integration loop and a straight track. In addition to the tracks, the Integrated Train Testing Centre would have an operations control centre, as well as maintenance and refurbishment workshops.

Testing of electrical, mechanical and signalling components would take place for metro lines already in operation and those being developed. By enabling some testing and

repairs to take place away from the running lines, this would reduce the need for line closures and make more time available for infrastructure maintenance, according to LTA.

In the longer term, LTA envisages that the ITTC would be used to 'develop deeper operations and maintenance competencies and achieve engineering excellence', as well as provide training to local workers. The site could also be used for R&D activities and mid-life train refurbishment.

LTA expects to call tenders for a contract to design and build the ITTC in the next few months, with construction due to begin in mid-2020. The first rolling stock to be tested at the ITTC would be 11 three-car trainsets that Alstom is supplying for the Circle Line 6 extension. These are due to arrive at the test centre around the end of 2022.

Related news

- 16 Nov 2018 - Autonomous vehicle research centre to be set up in Singapore
- 20 Aug 2018 - Singapore data analysis contract awarded
- 07 Nov 2017 - Transport research centre to be set up in Singapore

Brussels articulated electric Bus Order placed; Belgium

03 Jan. 2018

BELGIUM: Brussels city transport operator STIB has awarded a €21m contract to Solaris Bus & Coach for the supply of 25 articulated electric buses. This forms part of STIB's plan to have an entirely electric bus fleet by 2030.

To be assembled at Solaris' Bolechowo factory near Poznań, the Urbino 18 buses are due to enter service in early 2019, with deliveries scheduled to be completed in June that year.

Under the contract, Solaris will also supply charging infrastructure in co-operation with Schaltbau Refurbishment. This will consist of two depot chargers and two opportunity charging stations supplied by medium voltage/low voltage transformer stations. The depot will be equipped with 24 pantograph charging stations, supplied by a new medium voltage/low voltage transformer station, to be used for overnight charging.

Edmonton Valley Line LRT 50% done; Canada

Written by John Thompson, Canadian Contributing Editor

Boring of the short Downtown Tunnel Section. All Photos Courtesy TransEd.

Construction on Edmonton, Alberta's eight-mile Valley Line LRT line is moving along and is near the halfway point. Upon completion, it will give the Alberta capital 23 miles of LRT. The new line features 11 stations. It will run on Street Level, Underground and as well on elevated Structure.

The project represents three "firsts" in Edmonton Transit Service's LRT policy: the first low-floor route; street-level operation downtown; and utilization of the P3 public-private process. TransEd Partners, comprised of Bechtel, EllisDon, Bombardier and Fengate Capital Management, has responsibility not only for designing and building the line, but also operating and maintaining it for 30 years.

One of the benefits to Edmonton of the P3 methos is the ability to avoid a significant increase to its employee roster, with all of the related costs.

In construction terms, the new route will be the first to have concrete elevated sections, chiefly to cross busy roads, as well as an aerial station. Previous lines utilize grade crossings or underpasses.

A view of one of the twin tunnels, lined with concrete, ready for the trackbed pouring.

One of the major challenges has been crossing of the North Saskatchewan River, across a deep valley. A new LRT bridge had to be built, due to the lack of a suitable road bridge. The structure features two towers on each bank, from which a balanced cantilevered deck is extended.

An Operations and Maintenance Facility has been constructed, and is ready to receive LRVs. Concrete ties are used in the yard, with wooden ones at several turnout locations.

Track is embedded in poured concrete at ground level locations; direct fixation is used for the tunnel, elevated and bridge sections. The route is a mixture of street running, side-of-the-road operation, and elevated trackage, with a short underground section downtown.

Track installation has begun, and a significant amount is scheduled for completion by the end of 2019. One thoroughfare, 95 Street, is being closed for eight months to speed up trackwork.

A reinforcing panel is lowered in place to protect the side-of-the-road alignment on Connors Hill.

TransEd has ordered 26 Bombardier Flexity seven-section cars, of which one arrived last year. They are being built at the Millhaven, Ontario plant, about 200 miles east of Toronto. Nine LRVs are expected in 2019, with the remaining 16 in 2020.

In common with similar construction projects, there have been unforeseen delays. One of these occurred during preliminary work involving the new bridge across the North Saskatchewan River. A huge, automobile-sized chunk of concrete was discovered on the river bed, at the site of one of the supporting piers. The offending concrete had to be broken up, a difficult and time-consuming process, to permit construction to proceed.

Another delay occurred when one of the spans of the LRT bridge across Whitemud Drive had to be replaced. It was discovered that the composition of the concrete was below standard, due to inadequate curing. As well, a sinkhole opened up on 95 Street, requiring correction.

TransEd has not confirmed if these delays will impact the scheduled December 2020 opening date. This will depend on whether the lost time can be made up.

A Section of the dual elevated Guideway takes Shape

Nevertheless, the Valley Line, once the first revenue trains roll, will bring rail transit to a section of Edmonton previously unserved. The city's LRT system holds the honor as the northernmost such operation in North America; the first section was opened in 1978, three years before San Diego's.

Categories: Light Rail, News, Passenger Tags: Breaking News, Edmonton Transit Services, TransEd Partners

Algiers Airport Rail Link inaugurated; Algeria

Apr. 30, 2019

A rail link to Algiers Houari Boumediene Airport was inaugurated on April 29, coinciding with the opening of the airport's new international terminal.

Related Posts
Glasgow Connectivity Commission calls for new urban rail network
May 2, 2019 | Metros
Lyon receives first MPL 16 metro train
May 2, 2019 | Metros
Testing underway on Avignon tram line
May 2, 2019 | Light Rail

The branch, which leaves the Algiers – Thenia line at Bab Ezzouar, includes a tunnel with an underground terminus station located between the domestic and international terminals.

According to a statement from Algerian National Railways (SNTF), the airport is initially being served by an hourly service from Agha station in central Algiers with a single fare of Dinars 80 ($US 0.67). Trains operate between 05.00 and 21.00 with a journey time of 19 minutes between Agha and the airport.

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

Categories: AfricaCommuter RailNews

Light Rail and Metro Rolling Stock: A Run-Down of some of the latest Train Deals; International

Posted on Apr. 16, 2019

As growing numbers of the world's populations choose cities and major towns as their home (the UN predicts that 68% of the world's population will live in urban areas by 2050, a 13% rise on today's percentage), so too does the requirement for efficient light rail and metro networks that enable them to run as efficiently as possible. Filling the transport gap can be achieved through a variety of means but as many of the world's cities will attest, an efficient and fast metro network does a pretty unbeatable job of transporting tens, hundreds and – on the world's biggest – sometime more than a million people a day. Unsurprisingly, the increased demand for modern transport solutions has been good news for the companies and suppliers providing the infrastructure, among them rolling stock manufacturers.

Many of the new light rail and metro trains won't be destined for brand new networks, but owing to the development of larger interiors that boost capacity with innovative walk-through designs, wherever they are used they will be helping cities, towns and conurbations to transport more people at a time. Taking such steps to provide citizens with quick and efficient means to get around can do wonders for a city, aiding economic development and improving social mobility. Here, we're providing a snapshot of some of the latest rolling stock deals to have gone through in, with news of new manufacturing plants, train fleets and signalling systems from across Europe, North and South America and Asia.

Staking its commitment in the US market, Stadler announced in April that it has been nominated to provide Atlanta's Metropolitan Atlanta Rapid Transit Authority (MARTA) network with 127 trains in a deal worth $600 million. The deal held extra significance for Stadler owing to the fact that its trains would be the first to be built at its new manufacturing plant, after the Swiss train builder moved its American operations to Salt Lake City. The 230,000sq. ft unit will now according to Stadler be able to handle all US train production, including California's electric CalTrain trains and 16, six-car KISS model double-decker electric multiple-unit trains.

The site, which is located in the sparsely populated region, has been fitted up with testing facilities in the form of a 1,000-metre track with overhead catenary systems, allowing Stadler to test all of its fleet as they come off the production line and before they're transported to US customers via the nearby freight and Salt Lake Garfield & Western Railway lines. In other news, Stadler unveiled the first train that it had made for the Belarusian market, with the launch of six, four-car and four, five-car trains for the Minsk Metro that will run on the Zeleny Lug to Kurassovshina line – the first phase of which will reportedly open in the second half of 2019.

Medellín to London

From Switzerland to Germany; Siemens has thrown its significant weight behind the metro network in Medellín, Colombia – the metro network that made such a positive difference to the city when it first began operating in 1994. Today, Siemens has been tasked with the installation of its latest rail signalling technology on one of the city's two lines, a €42 million contract that includes the system design, implementation and certification for the wayside system.

Due to be switched on in 2021, the upgraded infrastructure will bring a welcome upgrade to the current infrastructure that was installed more than two decades ago and will as a result increase capacity on the line and provide a safer experience for passengers. The news comes around six months after Siemens was chosen by Transport for London to supply the next-generation trains for the London Underground, an agreement that will see the introduction of 94 trains that will replace the network's 40-year-old fleet of Piccadilly Line trains from 2023. With an open, walkthrough-style design that boosts capacity, the £1.5 billion deal has been awarded with the expectation that Siemens Mobility will build trains for three other London Underground lines.

India to France

With two major deals that were announced within days of each other, it's been a good March and April for Alstom. The French train manufacturer will be providing more trains for Paris Metro, while Pune and Mumbai in India will both be upgrading its metro lines with **Communication-based Train Control (CBTC) System, Urbalis 400**. Alstom's involvement in the two lines adds up to a deal value of more than €90 million that will include the combined lengths of Mumbai's Line 2 and Line 7, work that according to the company will make them among the most extensive signalling projects in the South Asian country.

In France's capital, meanwhile, Alstom has won a contract worth more than €100 million to supply 23, three-car trains for lines 16 and 17 – part of "the government's determination to double the Paris metro network over the next 15 years", said Alstom. That deal, which adds to Paris' existing 25-train agreement, will reportedly secure more than 1,000 jobs in France and see the first vehicles leave the manufacturing plant in 2022 to enter service around two years later.

- May 02, 2019
- Light Rail, News, Passenger

TTC ticked by Flexity issues; Canada

Written by John Thompson, Canadian Contributing Editor

TTC Bombardier Flexity Freedom LRV at Union Station, Toronto. William C. Vantuono Photo.

The Toronto Transit Commission (TTC) has been experiencing significant in-service reliability issues with its fleet of new Bombardier-built Flexity Outlook LRVs.

The contract calls for the streetcars to travel 35,000 kilometers (21,748 miles) before experiencing a major failure that delays service for five minutes or longer. However, during January 2019 the cars had problems, on average, after just 7,577 km (4,708 miles).

The TTC said that the Flexities' poor January performance was the result of an increase in failures that involved almost all vehicle systems.

These included an issue with the braking systems, which the Commission stated could not be quickly corrected. Brake failures during January more than doubled from the previous month: from 14 to 32. The problem stems in part from loose fasteners on brake calipers, as well as a leakage issue in the hydraulic system.

Flexities are taken out of service immediately upon signs of a braking system failure. Bombardier said that it has drawn up a plan with its brake supplier, and the TTC, that will take effect by this summer. A company spokesperson stressed that there is not an in-service safety issue with the Flexities' brakes.

TTC and Bombardier engineers are working jointly on engineering and quality modifications to correct the reliability problem. Nevertheless, the Commission could not predict when the 35,000-km target would be met. Earlier this year the TTC had more than

6,000 open work orders, including unfinished maintenance or modification jobs, on the Flexities. This situation has severely strained TTC staff.

The vehicle contract permits the TTC to seek damages from Bombardier if the reliability target is not achieved by the time that the final car, of the 204-unit order, is received. The TTC, though, hopes to avoid this scenario by working closely with Bombardier.

At press time about 140 Flexities had been delivered, with the remainder promised by year's end. The TTC's need for all 204 of these cars is urgent, as its remaining fleet of approximately 100 of the 40-year-old Canadian Light Rail Vehicles (CLRVs) is declining rapidly.

Categories: Light Rail, News, Passenger Tags: Bombardier, Bombardier Flexity Freedom, Bombardier Flexity Outlook, Breaking News, Toronto Transit Commission, TTC

Glasgow Connectivity Commission calls for new urban Rail Network; UK

May 2, 2019
Written by Keith Barrow

A STUDY into options for the future development of mobility in Glasgow has recommended the creation of a new network of urban rail lines with the aim of creating an "inclusive, liveable, thriving city."

Related Posts
Queensland reopens Mount Isa line after flood damage repairs
May 3, 2019 | Australia/NZ
Riga tramway modernisation contract terminated
May 3, 2019 | Light Rail

The Connecting Glasgow report presents the conclusions of a study by the independent Glasgow Connectivity Commission, which was established in November 2017 under the stewardship of Professor David Begg.

The report states that Glasgow has a "(very) good network overall" by British standards, but the city "falls substantially short" of what has been achieved in similar-sized cities in other countries.

With the exception of the 10.5km Glasgow Subway, which is currently being modernised, the entire fixed public transport network is made up of heavy rail lines and the report says the absence of a modern mass transit system serving inner-urban destinations is a "glaring omission."

While the heavy rail network is dense it was significantly reduced in size by route and station closures during the second half of the 20th century. However, while some alignments were lost to redevelopment, many remain intact, including tunnels once part of the Central Low Level network.

"The asset value of this dormant infrastructure could be measured in the billions of pounds, and therefore Glasgow has a ready-made basis for enhanced rapid transit that most cities can only dream about," the report says.

While it provides a good degree of regional connectivity, which has helped Glasgow to attract high-value employment, the report argues the current network is inadequate for meeting urban mobility needs.

Large parts of the most deprived areas of city are poorly served by the rail network, with huge inequality in journey times. Many of the areas with the most urgent need for better transport connectivity lie on closed railway routes. The report says connecting these areas to the railway network is vital for social inclusion and economic growth.

The commission therefore says the first priority of a wider strategy to transform the fixed public network should be the creation of the Glasgow Metro, a network of high-capacity transit lines serving as much of the city as possible.

This network would encompass parts of the heavy rail network such as the Cathcart Circle and the Central Low Level Line, which are more suited to high-density services and trains with better acceleration profiles, enabling the creation of new stations between existing ones.

The network would reactivate abandoned infrastructure such as former Central Low Level Line via the Botanics to Maryhill, and the London Road tunnel to the sports and events cluster at Parkhead and Tollcross, together with new spur lines to areas never before served by rail near these corridors, especially in the north east of the city.

The first Line would serve Glasgow Airport.

There would also be completely new sections, such as a line from the city centre to the airport via the South Clyde Growth Corridor and street running sections on wide boulevards such as Edinburgh Road and Great Western Road.

The commission does not take a view on which particular rapid transit technologies will be suitable for each route and suggests a mixture of different technological solutions may be needed for different corridors.

However, the Commission recommends that the first line should run between Paisley Gilmour Street heavy rail station and Glasgow Airport, with a suggested completion date of 2025 in line with the existing timeframe for the Glasgow Airport Access Project. In subsequent phases this could be extended to the city centre via the South Clyde Growth Corridor, which includes Renfrew (the largest town in Scotland without a railway station), Braehead, the Queen Elizabeth University Hospital and Royal Hospital for Children, Subway and bus interchange at Govan, and Pacific Quay.

Connecting Central and Queen Street

In addition to the metro, the report advocates a cross-city heavy rail tunnel connecting the city's two main stations, Queen Street and Central. The most straightforward option would be for a tunnel running from the Ayrshire and Inverclyde lines in the vicinity of Shields Junction via a single underground station in the city centre located in between Central and Queen Street.

The current Terminus Station at Queen Street.

From the city centre, the tunnel would then continue north paralleling the tunnel from Queen Street high level station, rejoining the existing network near Cowlairs Junction.

This would potentially provide capacity for around 20 trains across the centre of Glasgow per hour, significantly increasing rail capacity in the city centre. This could also allow Edinburgh and Ayrshire express services to be combined, connecting markets that currently lack direct rail links.

Categories: Light RailMetrosNews

Tags: BritainGlasgowScotland

Stadler signs Waldenburgerbahn Contract; Switzerland

29 Apr. 2019

SWITZERLAND: Baselland Transport and Stadler Rail signed a contract on April 26 for the supply of 10 Tramlink Be 6/8 vehicles to operate on the Waldenburgerbahn. The contract signing follows BLT's approval on April 17 of a SFr54m credit line to support the purchase.

The vehicles have been ordered as part of a project to modernise the 13·1 km single-track line from Liestal to Waldenburg, which includes **regauging from 750 mm to metre gauge**. On completion the line will become BLT Line 19.

Stadler was selected as preferred bidder in October. The order is being placed under a joint procurement with Aargau Verkehr, which is to receive eight Tramlink vehicles for the Limmattalbahn project in Zürich. BLT said it was saving SFr3·3m through the joint procurement.

Stadler is to deliver a pre-series vehicle from its Valencia factory by October 1 2021 to Bremgarten for testing by Aargau Verkehr. The remaining nine are to be tested on the 2·5 km test track at the factory, ahead to delivery to Waldenburg from July 2022. They are due to enter service from December 11 2022.

The 100% low-floor seven-section bidirectional vehicles, which would run in pairs during peak times, are to replace the current Waldenburgerbahn fleet, which dates from 1985-93.

METRO NEWSLETTERS

on

URBAN MOBILITY AS A SERVICE

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

TRANSPORTATION AND ECONOMIC DEVELOPMENTS IN MODERN URBAN/MEGAPOLIS ENVIROMENT

METRO Newsletter by Dr. F.A. Wingler
METRO 64, May 2019

LINSINGER Rail Grinding Machine M 11 for Metro Rail preventive Maintenance Rail-Reprofiling and Grinding

PART I: ACTIVITIES FOR URBAN MOBILITY AS A SERVICE IN INDIA

Delhi Metro's Blue Line Extension in Noida gets Safety Nod; India

. Delhi | Press Trust of India | Updated: March 07, 2019 08:26 IST

Sector-52 Metro Station of the Blue Line

New Delhi: The 6.6 km Noida City Centre-Noida Electronic City section, an extension of the Delhi Metro's Blue Line, has got safety approval and will open for public soon, officials said Wednesday.

The new Section of the Delhi Metro Blue Line stretches across six Stations and is completely elevated

Prime Minister Narendra Modi is likely to inaugurate the section on March 8, official sources said Tuesday.

"Commissioner of Metro Rail Safety S K Pathak has accorded the mandatory approval for the commencement of passenger operations on the 6.675-km Noida City Centre - Noida Electronic City section of the Blue Line, which was inspected on Monday," a DMRC official said.

The completely elevated section with six stations -- Sector 34, Sector 52, Sector 61, Sector 59, Sector 62 and Noida Electronic City -- will immensely benefit the people of Noida and connect the satellite city with the national capital.

On March 8 , the prime minister is also slated to inaugurate the 9.4-km-long Dilshad Garden-New Bus Adda Section, an extension of the Red Line.

"Passenger services on this Red Line section are slated to start on March 9, from 8 am, following the formal inauguration of this stretch on March 8," the DMRC official said.

It has already been granted the nod by the Commissioner of Metro Rail Safety (CMRS) and will take the rapid transit network into the interiors of Ghaziabad for the first time.

The Delhi Metro's current operational span is 327 km with 236 stations.

After opening of the two corridors, it will extend to over 342 km with 250 stations.

Once the Noida City Centre-Noida Electronic City section becomes operational, the extended corridor will also bring the Blue Line close to the recently-opened Aqua Line, which connects Noida and Greater Noida.

The Sector-52 station of the DMRC's Blue Line is very close to the Sector-51 station on the Aqua Line, operated by the Noida Metro Rail Corporation (NMRC), and its commuters are awaiting last-mile connectivity between the two lines.

Plans are afoot to connect the two lines through a dedicated pathway and a carriage-way for e-rickshaws, officials had said.

Blue Line Depot

Mumbai to become first Indian City to launch ‘One-Nation-One-Card’ System; India

May 6, 2019 Rail News

Mumbai will soon become the first city in India to roll out ‘One nation One card‘ system where commuters can use their normal bank debit card to use any mode of transport. The pilot project comes following a meeting in Mumbai of the representatives of various ministries in the last week of April.

More Information:

- The ‘one nation one card’ project is the brainchild of Urban Development Ministry.
- The scheme is based on the National Common Mobility Card guidelines of the ministry.
- The scheme was announced by Prime Minister Narendra Modi while inaugurating the Ahmedabad Metro in March this year.
- Under the scheme, the card will have a wallet with a specific amount of money which can be used for travelling as well as retail purchase, Mumbai Mirror reported.
- The transport agencies in Mumbai including BEST (Brihanmumbai Electric Supply and Transport), the railways and MMRDA (Mumbai Metropolitan Region Development Authority) are unanimously working to implement Integrated Transportation System (ITS).
- An official quoted as saying in the report,“In the first phase, major transport operators such as Railways, Metro and BEST will be included, while in the second phase it will also be extended for payment of tolls at the nakas on highways.”
- MMRDA has floated tenders on PPP (Public-Private-Partnership) mode for implementing the ITS.
- “All upcoming construction projects are being planned to be ITS-complaint. Besides, we are in the process of sending a detailed plan on the mobility card to the railway board for its approval,” an official of the MRVC (Mumbai Railway Vikas Corporation) told Mumbai Mirror.

India to soon have ‘One-Nation-One-Card’ for Public Transport; India

“A robust transportation sector is the backbone for the development of any economy, especially for a densely populated developing country like India, and the focus of the nation’s urban mobility strategy is on sustainable modes of public transport, transport-oriented planning and digitalization” - NITI Aayog CEO Amitabh Kant..

September 4, 2018 Rail News

Hyderabad Metro

Date of Post: 04 Sep, 2018

New Delhi: India will shortly unveil a “one-nation-one-card” policy for public transport that will bring seamless connectivity between various modes of transport, NITI Aayog CEO Amitabh Kant said.

“A robust transportation sector is the backbone for the development of any economy, especially for a densely populated developing country like India, and the focus of the nation’s urban mobility strategy is on sustainable modes of public transport, transport-oriented planning and digitalization”, he said.

More Information:

- “**The objective of the strategy is to plan for the citizens first, rather than focusing on vehicles alone, by providing sustainable mobility** and accessibility by switching to cleaner mode of transportation,” he said at the “Future Mobility Summit-2018-India’s Move to Next Generation Transport Systems”.
- The road transportation segment alone contributes to around 4% of India’s GDP with the segment still being heavily dependent on fossil fuels.
- Kant said, in the wake of the worsening air quality in the country’s major cities, rising concerns of climate change and an ever-increasing oil import bill, urban mobility is a crucial piece of the development puzzle and the key to unlocking the potential of India’s economy and people.
- The government was working towards achieving a robust mobility ecosystem across India, NITI Aayog Advisor Anil Srivastava said.

- He added: ”The citizens, on their part, should work towards sharing a ride, not owning the ride. The government has integrated many stakeholders across departments to drive India’s urban mobility vision.”

MMRC achieves two more Breakthroughs for Mumbai Metro-3 Project; India

Date : April 24, 2019

Mumbai: The MMRC (Mumbai Metro Rail Corporation) on Thursday achieved two breakthroughs at two different places for Colaba-Bandra-SEEPZ Metro-3 corridor. The first breakthrough took place at Vidhan Bhavan metro station and the second at Vidyanagari south shaft.

More Information:

- MMRC on Thursday tweeted,“MMRC’s PKG 1 delivers its first breakthrough at #VidhanBhavan metro station. 95 m long TBM Surya 1 began its Upline journey at #CuffeParade & tunnelled across 1.2 Kms to reach its destination.”

KMRL gets NOC for using Vyttila Mobility Hub Land for Water Metro Project; Kochi, India

May 6, 2019 Rail News

Kochi: The State Government has given NOC (No Objection Certificate) to Kochi Metro Rail Limited (KMRL) for using the land of Vyttila Mobility Hub (VMH) for the construction of Kochi Water Metro project, according to reports.

More Information:

- 123.5 cents of the land has been given to KMRL for the construction of the Kochi Water Metro Project as part of the phase-2 development of the Vyttila Mobility Hub project, following Detailed Project Report (DPR) by KMRL.
- Vyttila Mobility Hub is a Multi Mode Transport Terminal Project consisting of road transport, metro rail and the water metro.
- The chief secretary had convened a meeting December last with other officials concerned and took decision to hand over the land to KMRL for the water metro project.
- Following this, VMHS managing director had sent a letter to the government asking permission to issue the NOC to KMRL for using the land.
- Meanwhile, the Kochi Corporation is yet to handover the land for construction of Water Metro terminals at Vypeen, Fort Kochi and Mattancherry.
- Mayor Soumini Jain told civic officials to submit a report on handing over the land before the next council meeting.

MMRC achieves two more Breakthroughs for Mumbai Metro-3 Project; India

Date : April 24, 2019

Mumbai: The MMRC (Mumbai Metro Rail Corporation) on Thursday achieved two breakthroughs at two different places for Colaba-Bandra-SEEPZ Metro-3 corridor. The first breakthrough took place at Vidhan Bhavan metro station and the second at Vidyanagari south shaft.

More Information:

- MMRC on Thursday tweeted,"MMRC's PKG 1 delivers its first breakthrough at #VidhanBhavan metro station. 95 m long TBM Surya 1 began its Upline journey at #CuffeParade & tunnelled across 1.2 km to reach its destination."

- “A Robbins make 600 MT weighing TBM Surya 1 started its initial drive on 10th Aug 18 and used 823 rings to complete it’s journey installing at an Avg of 7 Rings per day in its main drive”, MMRC said in another tweet.
- Immediately in the 2nd tweet, it stated, “TBM Godavari- 4 delivers 12th breakthrough for MMRC & a 3rd one for PKG 5 at Vidyanagari south shaft. With this Metro 3 today accomplished 2 breakthroughs in a day with first one being at #VidhanBhavan stn this morning.”

- “A Terratac make 82 m long TBM Godavari-4 began tunneling from BKC north shaft on 24th Oct 18 & tunneled across 889 m for 176 days at an avg of 5 m/day to reach Vidyanagari.”
- “MMRC completes 5 Kms of cumulative tunneling in PKG 5. TBMs Godavari – 1, 2,3 & 4 achieved this feat tunneling between #BKC #Vidyanagari #Santacruz & #CSMIA Domestic metro station,” MMRC said in another tweet.

All Image Credit: MMRC

Some Past Related Updates which might interest you :

11 Apr, 2019: Mumbai Metro Tender Update: Design, Engineering, Manufacture, Supply, Storage, Civil Work, Erection of Suitable Structure, Testing & Commissioning of Roof Top Solar PV Project

20 Mar, 2019: Mumbai Metro Tender Update: Design And Construction of Elevated Viaduct And Elevated Stations

19 Mar, 2019: Mumbai Metro One launches 2-in-1 travel smart card

Delhi Metro likely to be connected with RRTS Corridor; India

May 4, 2019 Rail News

The Delhi Metro's Phase-3 may be connected with the Delhi-Ghaziabad-Meerut RRTS corridor, according to a report. The Ghaziabad Development Authority (GDA) has asked the DMRC to prepare a revised DPR (Detailed Project Report) for metro route between Noida Electronic City and Mohan Nagar Metro station, it said.

More Information:

- The GDA has sought that one of the stations on the metro route should be integrated with a station on the RRTS (Regional Rapid Transit System) corridor near Sahibabad, TOI reported.
- Sahibabad will be one of the elevated stations on the inaugural corridor of the RRTS project between Delhi-Ghaziabad-Meerut.
- For the two networks to be integrated, the GDA has asked for them to be built closer to each other so that a skywalk can be created for the linking, it said.
- The revised report is expected to be submitted within a month.

- The idea of integrating the Vasundhara Sector-2 metro station, on the Phase-3 corridor with the proposed RRTS station at Sahibabad was discussed and the GDA wishes to connect the two for the seamless access of both services, the report said.
- This integration would also mean that both the nodal agencies, namely, the National Capital Region Transport Corporation (NCRTC), which is implementing the RRTS corridor, and the DMRC (Delhi Metro Rail Corporation) will have to make changes to their existing plans.
- The distance between the Sahibabad RRTS station and Vasundhara Sector-2 is around 1.6 km and it would not be possible to construct a skywalk of that length to connect the two stations, as per the present outline.
- So, NCRTC and DMRC will have to shift their stations, respectively, closer to each other so that the distance between the two comes down to around 300-350 metres.

Delhi Metro celebrates its 25th Foundation Day; India

Date : May 4, 2019

New Delhi: The Delhi Metro Rail Corporation (DMRC) on Friday, 3. May 2019, celebrated its 25th Foundation Day with Vice President M Venkaiah Naidu as the chief guest. The Vice President congratulated Delhi Metro for entering the 25th year and lauded the commendable efforts of DMRC in providing world class services.

Vice President M Venkaiah Naidu

More Information:

- The event was held at Manekshaw Centre.
- DMRC chief Mangu Singh, Secretary, Ministry of Housing and Urban Affairs and Chairman, DMRC Durga Shanker Mishra, and Delhi Chief Secretary Vijay Dev were also present on the occasion.
- The Vice President expressed concern that Indian cities have been witnessing an "undesirable shift" from use of public transport to private vehicles and urged all stakeholders to work towards promoting **multi-modal transportation systems** to reverse the trend.
- He also asked Delhi Metro to focus on boosting last-mile connectivity for passengers.
- The vice-president urged all stakeholders in the transport sector to work towards promoting use of public transport.

- Naidu said,"Our cities need to increasingly focus on introducing multi-modal transit systems. Public transport should take precedence over personalised motor transport and every stakeholder should work in that direction."
- He cited examples of countries such as the Netherlands, which have promoted public transport and facilitated use of cycles and other green modes of transport to ease pedestrians.

Delhi Metro:

- Currently about 657 km of metro network are spread across various cities in the country out of which 410 km have been made operational in the last 5 years, Mishra in his address said.
- He said,"About 802 km of network is under various stages of construction across the country."
- DMRC was registered on this day in 1995 and its first corridor measuring 8.4 km was opened in 2002.
- Delhi Metro's current span is 373 km and 271 stations, including the Noida-Greater Noida Aqua Line, and its average daily ridership is about 30 lakh.
- Naidu praised Delhi Metro saying it is a **pioneer in metro network expansion in the country and a "symbol of the progress the country has made in the last few years".**
- He also gave away awards to various DMRC employees.

RRTS:

- On the **Delhi Meerut** Rapid Rail Transit System, he said, the distance of 82 km would be covered in 49 minutes spanning 16 stations.
- Mishra said,"The work on it is underway. And, we are doing planning exercise for two other RRTS as well, Delhi-Panipat and Delhi-Alwar, and DPRs for these two projects are being made. We will very soon begin work."

Hyderabad Metro launches dedicated Shuttle Bus Services; India

May 3, 2019 Rail News

Hyderabad: Hyderabad Metro Rail (HMRL) Managing Director NVS Reddy and Cyberabad Commissioner of Police V.C. Sajjanar flagged off dedicated shuttle bus services of Microsoft from Hitech City Metro station to Microsoft campus on Thursday in the presence of Microsoft Vice President Rajiv Kumar and L&TMRHL MD KVB Reddy.

More Information:

- Already 20 IT/ITES companies have introduced shuttle services from Hitech City and Durgam Cheruvu stations to their respective campuses and they include Value Labs, Epam, Invesco, Verizon, Cambridge, ICICI Bank, Novartis, Hexagon, etc., NVS Reddy stated speaking on the occasion.
- Reddy mentioned that L&TMRHL is also running "merry-go-round" services from Durgam Cheruvu and Hitec City Metro stations in Gachibowli and Financial District areas.
- With last mile connectivity slowly emerging, Metro ridership is steadily going up.
- Daily around 2.50 lakh passengers are using Metro Rail services.
- Vice President, Microsoft Rajiv Kumar indicated that introduction of shuttle services from campuses to Metro stations will benefit the employees and also reduce traffic congestion in this area.
- Several IT/ITES campuses are now making bulk purchase of Metro Smart Cards, L&TMRHL MD KVB Reddy informed.
- L&TMRHL Chief Operating Officer Anil Kumar Saini, HMRL CEE DVS Raju, SE Vishnu Vardhan Reddy, GM B.N.Rajeswar, DCP A.Balakrishna, Cyberabad DCP Vijay Kumar and other senior officers of HMRL, L&TMRHL and Cyberabad Police participated in the launching programme.

Hyderabad Metro Update: Metro Rail to be extended to Rajiv Gandhi International Airport; India

Date : April 29, 2019

Hyderabad: The Metro Rail service would be extended from MGBS to Rajiv Gandhi International Airport (RGIA) via City College and Bahadurpura in the near future, TRS

working president K.T. Rama Rao said on Sunday. The vital Nagole and LB Nagar metro stations would be connected, he also said.

More Information:

- He was interacting with netizens on Twitter (#AskKTR with netizens).
- He was asked questions pertaining to developmental works and issues such as enhancing green cover, status of the Jawahar Nagar dumpyard capping, last mile connectivity, construction of flyovers, underground drainage, among others.
- Brij Gopal Joshi asked Rao if were there any plans to connect MGBS Metro Station to Shamshabad Airport via City College and Bahadurpura since at times cabs were costing more than the air fare.
- Eventually there would be such an extension and also HMRL would soon connect LB Nagar and Nagole metro stations, Rao said.
- The Hyderabad Metro Rail (HMRL) is taking several measures to improve the last mile connectivity for the commuters.
- After the launch of services on the Ameerpet-Hitech City route, 56 kms of stretch are operational, making Hyderabad Metro the 2nd largest Metro in the country after Delhi Metro.

To know more about recent developments of Hyderabad Metro: Click Here

Some Past Related Updates which might interest you :

20 Apr, 2019: Hyderabad Metro achieves 2.30 lakh daily passengers mark

19 Apr, 2019: Hyderabad Metro targets to carry 10 lakh passengers every day in coming years

17 Apr, 2019: JBS-MGBS stretch of Hyderabad Metro to be ready by November-end

PART II: ACTIVITIES FOR URBAN MOBILITY AS A SERVICE; INTERNATIONAL

Shaping connected Mobility:

New Business Models: Urban Mobility as a Service; Siemens International

Gornergrat Bahn in Switzerland is already operating its Control Technology in the Cloud

Uber and Gornergrat Bahn lead the Way

Every day the success of Google and Amazon is revealing the unimagined potential hidden in big data. These companies show how a comprehensive data analysis contributes to making information or offerings accessible to a large number of users quickly and inexpensively via a central platform. New digital players such as Uber have also established themselves in the transportation industry. Uber provides a taxi service without actually owning any cars.

Similarly, since January 2017 the private Swiss railroad company Gornergrat Bahn and Siemens have been working together to show that you no longer need control system hardware to control your trains. For the first´ time ever, the control technology runs in the cloud! The heart of the solution is Siemens' traffic control and information system Iltis. The customer subscribes to it as a service based on a licensing model. The benefits include reduced investment and maintenance costs with the same level of reliable operation. Thus, "Urban Mobility as a Service", MaaS, is already a reality today. We're predicting that on-demand, service oriented business models will dominate rail traffic in the future.

SiMobility: Travel comfortably from Door to Door – without your own Car

“Mobility as a service” (MaaS) delivers mobility exactly where it’s needed. It makes it possible to link carrier systems that could never be efficiently networked before. The result is brand-new offerings and a new dimension of customer loyalty. Why buy a car when it stays parked for 23 hours a day? The **concept of multimodal travel** will reduce traffic in our metropolitan areas by conveying travelers comfortably and easily from door to door via various carriers. The travelers are correctly billed for all the carriers involved in their transport. The necessary technologies already exist today. Siemens’ ***SiMobility*** mobility platform offers the **Mainline Service of the Future, which will be digitally networked and highly automated.**

Although we have smartphones and buy eTickets using sophisticated apps, travelers today are still frequently caught in traffic jams, stuck on stopped trains, or have taxis snatched from under their noses. A smart, digitally networked infrastructure will change all that. With new digital solutions and business models, companies like Siemens will work with you – operators of the rail infrastructure – to implement the digital transformation so that passengers can safely and securely benefit from the many opportunities of tomorrow’s mobility universe.

Automation and digitalization are a great opportunity for passengers, operators, and the system of tracks (System Schiene) alike to remain competitive and cost-effective.

Together with our customers, we want to seize this opportunity to reach the next level of smart rail transport. The goal is to increase availability in mainline transport by almost 100 percent, to maximize throughput, and to enhance the travel ideal solution for optimally interconnecting carriers and passengers.

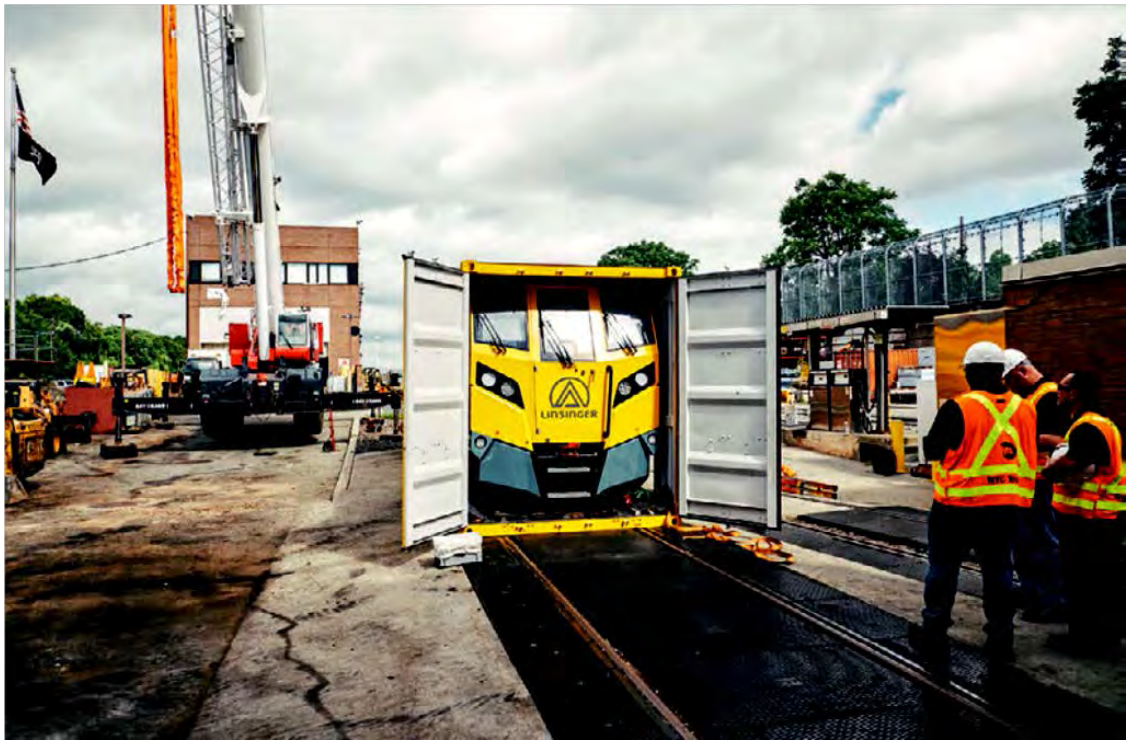
Mobile Rail Milling and Grinding of the next Generation for Metro/Transit Rail; Austria, USA

EI, Der Eisenbahningenieur 5, May 2019, p.61

PETER MOSER, RICHARD STOCK

Constantly growing numbers of passengers lead with many metro operators to a continuous reduction of the cycle times of the Trains, in consequence, this leads to an increasing load on the rail network. Conventional Rail Maintenance concepts in this case they are increasingly coming to their limits. As a result, the metropolis New York, USA, is looking for sustainable alternatives to traditional ones maintenance concepts; specially for use in metro tunnels.

The Austrian company ***LINSINGER*** developed the mobile High Performance Milling Machine **MG11,** which is for use in narrowest clearance profiles excellent. The milling machine has the proven for years as igh-performance milling technology, combined with new, innovative approaches. The **MG11** contributes so significantly to the extension of rail life of Metro Rail and Light Rail Transit and can reduce the life cycle costs considerably. The **MG11** can be transported to the field site in a container:



MG11 in the 40ft Transport Container just before putting on Rails in the Depot of New York City Transit Authority, CTA; USA

Uber adds public Transport Ticketing Option, USA

03 May 2019

USA: Rail and bus tickets for travel in Denver can now been bought using the Uber taxi app.

The staggered roll-out of the ticketing option which began on May 2 follows the launch in January of Uber Transit journey planning, which provides Uber users with real-time public transport information for the mile-high city.

'We are excited to expand our collaboration with Regional Transportation District and Masabi to make Denver the first city in the world where riders can purchase transit tickets and ride public transit seamlessly through the Uber app', said David Reich, Head of Transit at Uber. 'With this step, we are moving closer to making Uber's platform a one-stop shop for transportation access, from shared rides to buses and bikes.'

Tickets are sold using Masabi's Justride technology. When Uber app users enter a destination, they are offered 'Transit' as an option in the 'choose a ride' selector. They can then purchase, activate and use tickets including 3 h, one day and monthly passes, which are stored in the 'Transit tickets' section of the Uber app and available when offline. Tickets cost the same amount as through other purchase options. The app also provides real-time information and walking directions to and from stops.

'This exciting next phase of RTD's collaboration with Uber is yet another way our transit agency is leading the dialogue about mobility strategy, not just for the Denver metro region but for cities across the globe', said RTD CEO & General Manager Dave Genova. 'This project broadens our reach and stays at pace with the public's needs, allowing people to plan and pay for trips from start to finish.'

Masabi CEO Brian Zanghi said 'we know convenience is the number one reason people choose a transit option, and we truly believe that a multimodal public and shared private approach will be a key part of encouraging more people to take fewer private car journeys, reducing congestion for all.'

Related news

- 29 Apr 2019 - Denver G Line inaugurated
- 01 Feb 2019 - Uber to offer public transport options in Denver
- 12 Apr 2018 - Uber app to offer public transport tickets
- 04 Dec 2017 - Uber and Citymapper become UITP members

Denver launches Sale of Transit Tickets via Uber app; USA

May 6, 2019
Written by David Burroughs

DENVER Regional Transportation District (RTD) launched Uber Transit ticketing, a service which allows passengers to purchase metro and bus tickets through the Uber app, on May 2 with the system set to be rolled out over the coming weeks.

Related Posts:

Smartwatches to boost punctuality at Dutch stations
May 6, 2019 | Technology
Consultation begins on Lyon light rail extension
May 6, 2019 | Light Rail
Gdansk orders more Pesa Jazz Duo LRVs
May 6, 2019 | Light Rail
Crossrail “past the point of no return” says National Audit Office
May 3, 2019 | Metros

The system has been developed using Masabi’s Justride software development kit (SDK).

RTD says tickets purchased via Uber will be priced the same as those bought through existing channels. After passengers enter a destination on the app, they will see “transit” as an option in the “choose a ride” section. After selecting transit, passengers will be able to purchase tickets on all available transit options while also having access to real-time schedules and walking directions to and from transit stations.

Uber's menu bar will allow the passengers to purchase and redeem a range of RTD ticket services, including three-hour, day and monthly passes with all tickets available offline. The passenger activates ticket, which is stored in the "transit tickets" section of the Uber app, when boarding the train, tram or bus.

"For the first time ever, taking an Uber trip can mean taking public transit," says Uber head of transit, Mr David Reich. "With this step, we are moving closer to making Uber's platform a one-stop shop for transportation access, from shared rides to buses and bikes."

Categories: Commuter RailLight RailMain lineNewsNorth AmericaTechnology
Tags: ColoradoDenverMasabiRTDticketingUberUnited States

UITP Global Public Transport Summit 2019

June 9-12, Stockholm Stockholmsmaessan:

Welcome to the Future of Urban Mobility, Siemens Mobility; International

As the trend toward urbanization accelerates worldwide, cities need solutions for some of their most pressing demands: the need to transport growing numbers of people in an

efficient, reliable, safe and sustainable way. Therefore comprehensive mobility concepts and seamless intermodal solutions are becoming increasingly important.

Siemens Mobility has the extensive expertise and experience to deliver digital innovations that increasingly cross-link the “complete mobility system”. Under the slogan “Shaping connected mobility,” we will showcase those pioneering solutions at this year’s UITP Summit – solutions that guarantee availability, make trains and infrastructures intelligent, increase value sustainably over the entire lifecycle, and improve passenger comfort and travel experience.

Welcome to Stockholm and welcome to the future of urban mobility.

Highlights

Rolling Stock

Siemens Mobility is one of the leading providers of rolling stock for mass transit and regional transport, equipped with state-of-the-art drive and train control systems as well as the latest digital onboard technologies. These solutions increase energy and economic efficiency and improve availability and travel comfort and convenience – sustainably over the entire lifecycle:

- Autonomous Trams
- Avenio Tram, Light Rail
- Inspiro Metro
- Fully Automated Val People Mover
- Desiro and Mireo Regional Trains
- Alternative Drive Systems
- Digital Vehicle Technologies Mobility services

Mobile Service

The economic efficiency and availability of rail service are the keys to your success. With our innovative service portfolio and the combination of domain know-how, data analysis expertise and a worldwide network of experts, Siemens Mobility Services helps you optimize your operations. The result: keeping your customers satisfied by enhancing passenger experience and increasing value sustainably over the entire lifecycle. We guarantee up to 100% system availability with:

- Railigent® - powered by MindSphere
- Easy Spares Next Generation
- Fully Digitalized Depot

Intelligent Infrastructure

Digitalization is also transforming transport infrastructures. For example, Siemens uses its open IoT MindSphere operating system to comprehensively manage data from the Internet of Things and provide completely new cloud-based solutions. This reduces the need for hardware components, optimizes rail and road traffic and is vital for greater operational flexibility as well as smart process automation and networking:

- Digital Station
- MindConnect Rail / Data Capture Unit DCU

- Mass Transit/Bike Priorization Stream
- eBus/eVehicle Charging Infrastructure
- Building Information Modeling

Intermodal Mobility Solutions

Together with Hacon, eos.uptrade, Bytemark and Padam, we offer a unique ecosystem of digital services and networked solutions for optimal travel comfort and convenience. Passengers are offered travel alternatives tailored specifically to their individual situation and needs for getting from A to B simply, comfortably and safely. At the same time, transport operators can use Intermodal Data Analytics to continuously optimize their mobility services and increase customer satisfaction:

- Mobility as a Service (MaaS)
- Demand Responsive Transport
- Smartphone-based Ticketing
- Mobility Data Analytics

How Digitalization is evolving intelligent Rail Infrastructure

Trends and solutions for tomorrow's connected rail transportation: Download whitepaper

First driverless Glasgow Subway Train delivered; UK

07 May 2019

UK: The first of 17 driverless metro trainsets that Stadler is supplying for the Glasgow Subway has arrived in the city ahead of the start of on-site testing. Two more are due to be delivered by the end of the summer.

In March 2016 Strathclyde Partnership for Transport approved the award of a £200m contract for a consortium of Stadler and Ansaldo STS to supply a fleet of trains and signalling.

This is part of a £288m modernisation programme for the 10·5 km circular underground metro line, towards which the Scottish government is providing up to £246m. The modernisation also covers tunnels, track and stations, which will be fitted with half-height platform edge doors.

Expected to enter service from next year, the 1 220 mm gauge four-car trainsets with walk-through gangways will replace the existing fleet of three-car sets. According to Strathclyde Partnership for Transport, they will operate without drivers once the signalling and control systems have been fully tested. 18 Sep 2018 - First driverless Glasgow Subway train on show

BYD wins further Swedish electric Bus Order; Sweden

07 May 2019

SWEDEN: Bus operator Nobina has ordered 20 K11 articulated electric buses from BYD.

Deliveries of the 18 m long vehicles are due to begin at the end of 2019. Four of the buses will be put into service in the Barkarby district of Stockholm, and 16 in Linköping. The buses will be fitted with iron-phosphate traction batteries.

Last year Nobina placed orders from BYD for 10 buses 18 m long, 11 buses 12 m long and five 8·7 m midi-buses. Deliveries of all 26 are due to be completed in mid-2019. To date, BYD has delivered a total of 36 electric buses to Swedish cities including Eskilstuna, Ängelholm and Norrtälje and Landskrona.

Related news

- 27 Jul 2018 - BYD wins another Swedish electric bus order
- 16 Jul 2018 - BYD wins Oslo electric bus order
- 04 Jan 2018 - Oslo electric bus pilot begins

- 05 Jul 2017 - Electric buses ordered for Malmö

METRO NEWSLETTERS

on

URBAN MOBILITY AS A SERVICE

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

TRANSPORTATION AND ECONOMIC DEVELOPMENTS IN MODERN URBAN/MEGAPOLIS ENVIROMENT

METRO Newsletter by Dr. F.A. Wingler
METRO 65, May 2019

Future of electric Propulsion for Bus and Lorry with electric Cantilever Highway; Test Highway by *SIEMENS MOBILITY*, Germany

PART I: ACTIVITIES **AND INIATIVES** FOR URBAN **MOBILITY AS A SERVICE IN INDIA**

Tripartite MoU signs between Enterprise & Temasek Foundation International-Singapore Cooperation, MahaMetro and Pune Municipal Corporation for Multi-Modal Transport in Pune; India

January 12, 2018 Rail News

Date of Post: 12 Jan, 2018; Pune:

A 3-day workshop (10th-12th January 2018) is being organized in Pune by TEMASEK FOUNDATION INTERNATIONAL-SINGAPORE COOPERATION ENTERPRISE in coordination with Maharashtra Metro Rail Corporation Limited and Pune Municipal Corporation. The event witnessed the signing of the Grant Agreement for the **Urban Management (Multi-Modal Transport) Programme** in Pune.

Representative Image for Pune Metro

A tripartite agreement was signed between TEMASEK FOUNDATION INTERNATIONAL-SINGAPORE COOPERATION ENTERPRISE URBAN MANAGEMENT Maharashtra Metro Rail Corporation Limited and Pune Municipal Corporation. It was signed by Dr. Brijesh Dixit Managing Director Maha Metro, Mrs Prerna Deshbhrata, Addl Municipal Commissioner (Spl), PMC and Mr Kong Wy Mun, CEO, SCE.

Also present at this event were Mr. Ajit Singh, Consul-General of the Republic of Singapore, Mr Goh Keng Phang, Centre Director, IE Singapore, Mr Ramnath S, Executive Director, Maha Metro, Pune, Mr Ho Kum Fatt, Director, Systems Interface, Land Transport Authority, Singapore, Mr Mark Ng, General Manager, SMRT International and Mr Yeo Siew Wah, Director (Control Operations), SMRT Trains.

The capacity Building Program on **Urban Mobility and Multi – Modal Transportation Planning** for the city of Pune for 3 years has been proposed by Temasek Foundation International (TF Intl) and Singapore Cooperation Enterprise(SCE).

TF Intl is a Singapore-based non –profit philanthropic organization that funds and supports initiatives that aim to build capabilities as Asia. SCE is a Singapore government agency with the power to enter into Memorandum of Understanding relating to public sector collaboration projects with other foreign governments and their states.

The program aims at creating a cross learning platform and capacity building benefiting about 100 officers from PMC, PCMC, PMRDA, PMPML and Maha-Metro Corporation and their associated agencies in the area multi-modal public transportation and integration, and metro operations.

Maha-Metro Rail Corporation plays a pivotal role in the execution of this program and is set to also benefit from this program, in line with its plans for Multi –modal integration w.r.t Pune Metro. The key factor for the success of any Metro especially in a city like Pune is **Multi-Modal Integration**. This ensures increased ridership for the Metro Rail systems and also exploit various non-fare revenue initiatives, for long term self –sustainability of the Metro.

In the case of Pune, **Multi – Modal Integration of Metro** would be with Railways, Buses, BRTS other modes of transport. An in-depth planning also needs to be done in terms of coordination with PMC/PCMC, PMPML would be complimentary to ensure Metro ridership.

.PART II: ACTIVITIES FOR URBAN MOBILITY AS A SERVICE; INTERNATIONAL

Delivering "HIGH–TECH IN A SIMPLE WAY" on Rail`s increasingly complex digital Networks; Single Network Management System/Vertical Network Solutions, *ALACATEL-LUCENT* Enterprise (ALE). , International

No less a person than Albert Einstein once said; "The definition of genius is taking the complex and making it simple." The words of the famous physicist came to mind on a recent visit to the control room of a metro network, where the staff showed us the huge array of data that is now available to them.

By Daniel Faurlin, Business Line Manager - Vertical Network Solutions, Alcatel-Lucent Enterprise.

These immense quantities of data, along with the increased number of networks, applications and devices that are employed across rail and metro networks, has changed how our industry works, irrevocably. And when it comes to signalling and train control, digital transformation offers both huge opportunities and some significant challenges.

Although traditionally serial-based, rail and metro communications networks are moving to IP and, in wired networks specifically, to IP/Ethernet. As part of this move a modern rail network now typically operates sub-systems off an access backbone network within the core network. The sub-systems usually consist of Communications systems (e.g. voice, radio and public networks), Security systems (CCTV, access control, Operations centre day-to-day and crisis operations), Electro-mechanical & BMS (Scada), Information systems (public address, information, commercial messages) and Business applications (ticketing, CRM and retail). These sub-systems use technologies enabled by the Internet of Things (IoT) and in some cases with sensors across the train and track-side feeding a stream of information on everything from anomalies in speed, temperature and mechanical defects on railways, to the number of rail cars waiting at a station.

The tech that ***ALE*** supplies to railways around the world ensures this critical information is processed and acted on to maximize passenger safety. These sub-systems can reduce congestion and energy use, and improve operational performance, for example, Power over Ethernet simplifies device and sensor installation by eliminating the need for wiring in hard-to-reach and sometimes dangerous places. IoT devices enable a diverse set of applications but they are all linked by a common thread, connectivity to a network infrastructure.

However, while sub-systems connected within an IoT network offer a host of positives, it can also create potential problems. All rail sub-systems are vulnerable. In a poorly designed network, a compromised IoT device can provide a gateway to the rest of the network and other sub-systems. Attacks on non-critical networks like passenger Wi-Fi may seem, at the time, like an inconvenience rather than a major problem but can leave the entire network exposed to cyber criminals. With systems now having 100,000's+ of connected devices that could be vulnerable, the need for security has never been more relevant. The hack of the San Francisco public transport system's ticketing machines in 2016 and the WannaCry ransom ware have highlighted this. But a properly designed network, as deployed and built by ***Alcatel-Lucent Enterprise ALE*** with appropriate security measures, will reduce the risk of successful cyber attacks.

ALE minimizes risks by using IoT containment to separate and secure specific devices or a group of devices on a network. Each key system, for example ticketing or video surveillance, are in different virtual network containers for a business-critical network, so should one be compromised the whole network doesn't fall victim.

This approach is essential to maintaining security. ***ALE*** offers a physical network but with multiple virtual networks. As a result, there are no back doors. We recommend a separate safety-critical network for signalling, using the same containment approach to secure a virtual backup network.

"THE FOCUS FROM THE TEAM AT ALE IS TO SIMPLIFY INTEGRATED TRANSPORT (IT) WITH RAILWAY AND METRO UNDER A SINGLE NETWORK MANAGEMENT SYSTEM. AND THIS SIMPLIFICATION OF DESIGN HAS BENEFITS BEYOND JUST KEEPING THE NETWORK SAFE AND SECURE."

The focus from the team at ***ALE*** is to simplify IT for rail and metro with a single network management system. And this simplification of design has benefits beyond just keeping the network safe and secure. In our conversations with rail and metro operators, a key concern over major investments is its ability to keep pace with often rapid technological change and avoid obsolescence. There have been several recent examples where an upgrade of a system has cost more than the original equipment purchase. ALE is keenly aware of this potential barrier, and ensure that the networks are scalable and are easily able to absorb new devices as they grow and evolve. Hardened gigabit ethernet switches designed for outdoor deployment feature Power over Ethernet (PoE) to ensure scalability and simplify device and sensor installation.

Similar to overcoming operators' concerns about adopting a digital network, ***ALE*** user-centric solutions ensure that staff are up and running quickly with the new technology. And the award-winning Intelligent Fabric (iFab) technology helps get teams operational, faster, with self-healing and automated device discovery abilities.

With ***ALE*** networks often operating outside, trackside and in harsh conditions, robustness is another key requirement. ***ALE*** switches and sensors are within a hardened equipment solution with a ruggedized design. They are designed based on the needs of transportation customers. Because of the tough environment found at the track-side, these devices need to be hardened to support extreme temperatures, fan-less because it's a dusty environment and in addition, cope with temperature, vibration, shock and humidity. And we provide the only rugged switch that supports Shortest Path Bridging (SPB), a computer networking technology that helps build better bridged networks and significantly reduces re-convergence times, avoiding the high price of Multiprotocol Label Switching (MPLS) and limitations of Spanning Tree Protocol (STP).

The ***ALE*** approach offers a physical network with multiple virtual networks, along with a comprehensive layered approach to provide network security to minimize risks from cyberattacks. This focus also ensures that costs are lower than conventional networks, roll out is easier and expanding and amending the network in the future is straightforward. ALE is proud to deliver networks to a growing number of rail and metro operations around the world and provide both improved safety and efficiency.

A GLIMPSE INTO THE FUTURE

Multimodal Transportation will completely transform the way we travel. The technology is already here, enabled by open APIs that offer a single mobile application providing **"Urban Mobility as a Service"** rather than having to purchase tickets across different modes of transportation. Indoor location-based applications are being deployed that collect intelligence on user behaviours giving way to a new level of precise contextual awareness to enable personalized services. And finally, modern multimedia communication, that mix bots with people can match the richness of passenger needs and maintain the much needed personal touch. But the groundwork of network and systems that connect it all together must be installed now if we are to take full advantage of seamless travel. This means having a secure and reliable network that keeps passengers and operators connected no matter what mode of transportation they choose.

Editorial Credit: / Shutterstock.com By Daniel Faurlin, Business Line Manager - Vertical Network Solutions, Alcatel-Lucent Enterprise.

Integrated Multimodal Urban Mobility in Madrid; Spain

From Wikipedia, the free encyclopedia

Madrid is served by highly developed integrated and multimodal transport infrastructure. Road, rail and air links are vital to maintain the economic position of Madrid as a leading centre of employment, enterprise, trade and tourism, providing effective connections with not only other parts of the region, but also the rest of Spain and Europe as a whole. Three quarters of a million people commute into the city to work,[and these and other local travellers have available a high-capacity metropolitan road network and a well-used public transport system based on the Metro, the *Cercanías* local railways, and a dense network of bus routes.

In terms of longer-distance transport, Madrid is the central node of the system of *autovías* and of the high-speed rail network (AVE), which has brought major cities such as Seville and Barcelona within 2.5 hours travel time. Madrid is also home to the Madrid-Barajas

Airport, the fourth largest airport in Europe. Madrid's location at the centre of the peninsula makes it a major logistical base.

Local Transport

744,000 of the jobs in the city are held by residents of other municipalities, while 242,000 residents in the capital have jobs outside. Thus passenger flows are predominantly into and out of the city centre, although further decentralisation of economic activity to the outskirts is altering this pattern.

From the point of view of sustainable transport, Madrid has performed well from the compactness of the city centre and middle-to-high-density peripheral nuclei, favouring public transport and pedestrian movement. The weak points appear in the "new peripheries", with low-density residential developments and dispersal of journey destinations, leading to higher car use.

Road

Madrid's Motorway Hub Network

The outward expansion of Madrid after 1960 was supported by a growing network of radial roads. Above all these enabled commuter movements to the city centre. It also became necessary to create the first orbital *autovía*, the M30, which was intended to facilitate the passage of long-distance traffic, but became invaded by local traffic. The scheme implemented at the end of the 1980s consisted of nine radial autovías (those toward Burgos, Barcelona, Valencia, Andalucía, Toledo, Fuenlabrada, Extremadura, A Coruña and Colmenar Viejo) but just the one orbital route – the M-30. Three further orbital routes, each at a greater distance from the centre, were added in the 1990s and 2000s. These are designated M40, M45 and M50.

The most recent big scheme was improvement of the M30. This road is the inner ring motorway of Madrid. Significant portions of M30 run underground and its urban motorway tunnels have sections of more than 6 km (3.73 mi) in length and 3 to 6 lanes in each direction. Between the south entry of the *Avenida de Portugal* tunnel and the north exit of the M-30 south by-pass there are close to 10 km (6.21 mi) of continuous tunnels. M40 is a ring motorway which borders Madrid at a mean distance of 10.07 kilometres (6.26 mi) and it has a total length of 63.3 km (39.33 mi). M45 is a partial ring around the city serving the metropolitan area of Madrid. It was built to help alleviate the congestion of the M40 from the southern to the north-eastern, runs between the M40 and the M50 where the two ring motorways are more separated. M50 is the outer of the Madrid orbital motorways and has a total length of 85 km (52.82 mi). It services mainly the metropolitan area at a mean distance of 13.5 km (8.39 mi).

More recently, four new radial tolled *autopistas* (named R-n instead of A-n), listed below, form a new mode of access to the capital, merging with their *autovía* counterparts further from Madrid. The main advantage to these roads is that they allow true fast travel from the first kilometer. These, however, have frequently been under-utilised, especially after the economic crisis of 2008. The investment in roads has resulted in a high-capacity metropolitan road network, facilitating communications between the outer municipalities, and resilient against closures due to works or accidents. However, the new orbital roads have favoured the dispersion and fragmentation of residential areas and areas of economic activity, resulting in an array of urban developments separate from each other, and very dependent on private vehicles.

Public Transport

Rapid Transit in the Príncipe Pío Transport Hub

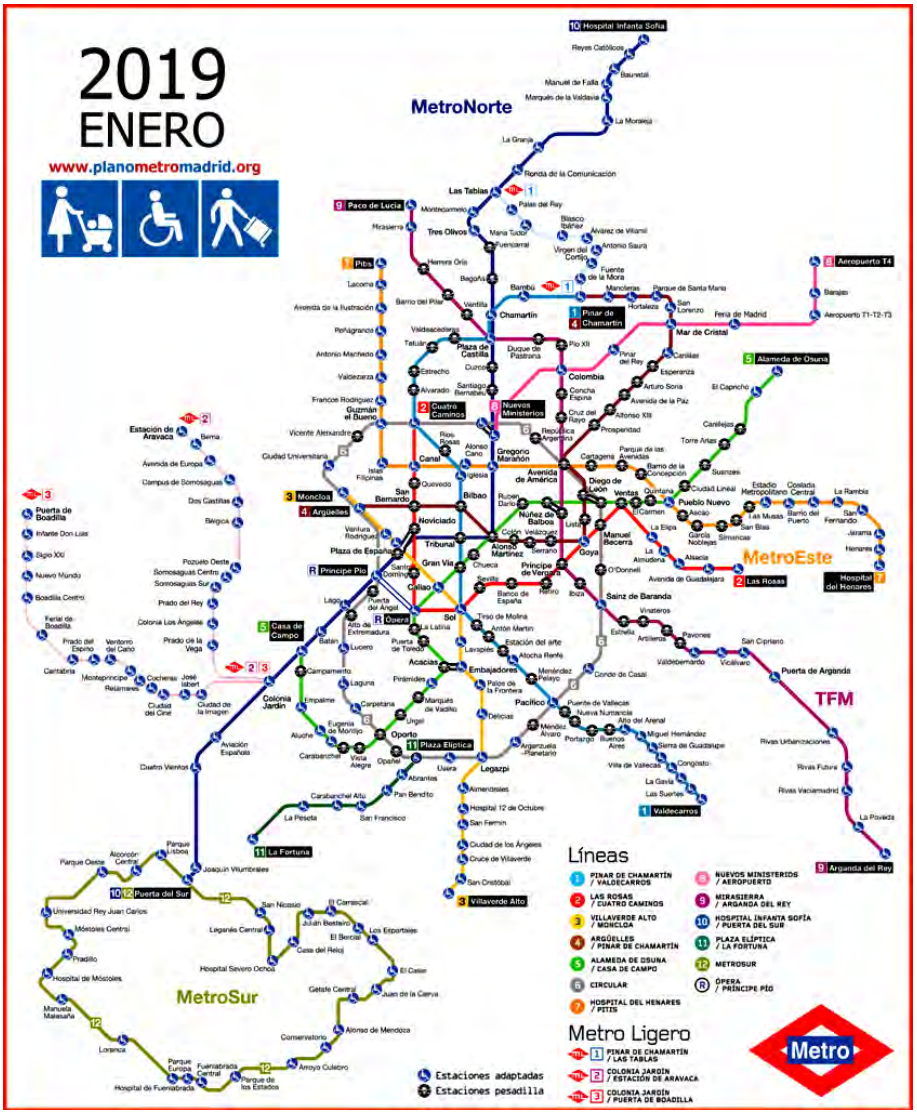
Madrid has built up an excellent public transport system, the fruit of long-term policies supporting the extension of the metro and Cercanías networks, the improvement of bus networks, the construction of 28 transport interchanges, and subsidies to public transport.

Almost half the journeys by mechanical means in the metropolitan area are made on public transport, a very high proportion compared with most European cities.

A mobility survey in 2004 counted 14.5M journeys per day in the region, of which 10.0M were mechanised. 48.6% of the latter took place entirely within the city, 22.5% started or finished in the city, and 28.9% were entirely outside the city. Public transport was used for 69.1% of journeys within the central area, down to 27.3% in the outer periphery (*corona regional*). Metro accounted for 40% of journeys by public transport, bus 30%, interurban buses 10%, and Cercanías 10%. More recent figures, for 2013, show passengers carried annually by bus 404M, Metro 563M, Cercanías 153M. The inner city relies for transport mainly on the Metro and the EMT bus service. As regards the periphery, public transport is based above all on the Cercanías and interurban buses. The metro, too, is extending into parts of the outer area.

Metro Rail

The Madrid Metro is one of the largest and fastest growing Systems in the World; Metro Station with Artificial Intelligence controlled Ventilation



Madrid Metro Map

Serving a population of some five million, **the Madrid Metro (*Metro de Madrid*) is one of the most extensive and fastest-growing metro networks in the world**. With the addition of a loop serving suburbs to Madrid's south-west "Metrosur", it is now the second largest metro system in Western Europe, second only to London's Underground. In 2007 Madrid's metro system was expanded and it currently runs over 287 kilometres (178 mi) of line.

The system is the sixth longest metro in the world after London, New York, Moscow, Seoul and Shanghai, though Madrid is approximately the fiftieth most populous metropolitan area in the world. Its fast growth in the last 20 years has also put it among the fastest growing networks in the world, on par with the Shanghai Metro and the Beijing Subway. Unlike normal Spanish road and rail traffic, Madrid Metro trains use left-hand running on some lines due to historical reasons.

The metro network consists of 238 stations. It has 12 lines, plus four “light metro” lines recently added. The network consists of diametrical lines, interconnected by one circular line (Line 6). It gives good coverage of much of the municipality – about 50% of the population live within 600 m of a metro station.

Buses

EMT Gas powered Scania Bus, Madrid

This railway network is supported by an ever-expanding network of city buses. The overall length of the bus network of Madrid's Municipal Transport Corporation (*Empresa Municipal de Transportes de Madrid*, or EMT Madrid) at the end of 2013 stood at 3,690 km (2,293 mi), marking a 31% increase over the last eight years. These routes are serviced by a growing fleet of over 3,000 vehicles. The EMT network is very dense, with 217 routes and over 10,000 stops, and almost all the population of the municipality lives within 300m of a bus stop.[The buses in Madrid are the only public transport system available 24hours as the metro network closes down during night hours. The night buses, also known as "*Buhos*" (Owls), run from 11.45 pm to 6.00 am.The heavy traffic in Madrid can in some cases make the city buses a fairly slow form of transportation but the city of Madrid has more than 90 km of special bus and taxi lines to help solve this issue. Buses serving the outer areas are run by 33 private companies, coordinated by the *Consorcio Regional de Transportes de Madrid*. This network is fundamentally radial.

Local Rail, Commuter Rail

Cercanías Madrid Commuter Rail Network (August 2017)

Spain's Railway System, the *Red Nacional de Ferrocarriles Españoles* (RENFE) operates the vast majority of Spain's railways. Cercanías Madrid is the commuter rail service that serves Madrid and its metropolitan area. It is operated by Cercanías Renfe, the commuter rail division of Renfe. The total length spans 382 kilometres (237.4 miles). Main rail terminals are Atocha in the south and Chamartín in the north. The Cercanías network consists of 9 lines and 98 stations.

Cercanías Madrid, Commuter Rail

Other Modes: Cable Car, Bike Sharing

Madrid has a single Cable Car, the Teleférico de Madrid, which links the Parque del Oeste with the Casa de Campo:

Teleferico Madrid Cable Car

The BiciMAD bike-sharing scheme with electric bikes, the first in the world, was introduced in 2014:

Electric Bike Sharing in Madrid

Madrid Public Transportation Statistics

The average amount of time people spend commuting with public transit in Madrid, for example to and from work, on a weekday is 62 min. 13% of public transit riders, ride for more than 2 hours every day. The average amount of time people wait at a stop or station for public transit is 11 min, while 13% of riders wait for over 20 minutes on average every day. The average distance people usually ride in a single trip with public transit is 9.5 km, while 25% travel for over 12 km in a single direction.

Long-Distance Transport

Although distant from other great centres of the EU, modern transport links are lessening this disadvantage. There has been large investment in transport infrastructure focusing on Madrid, including radial *autovías*, high-speed rail, and Madrid-Barajas airport.

High-Speed Rail

TALGO High Speed Train in Spain

Madrid ranks alongside Tokyo and Paris as one of the world's three largest high-speed railway hubs, acting as the focal point of the Spanish high-speed rail network, *Alta Velocidad Española* (AVE), inaugurated in 1992 with the opening of the Madrid-Seville line. There are now 2,900 km of AVE track, connecting Madrid with Barcelona, Málaga, Seville, Valencia, Valladolid, Zaragoza and 11 other provincial capitals. A tunnel has been constructed between the two terminal stations of Atocha and Chamartín, and Atocha has been expanded. The radial character and great extension of the AVE network confer on Madrid exceptional accessibility by rail: the journey time is only 2 hours 30 minutes to Barcelona and Seville. Connection from Madrid by AVE will further increase due to lines under construction to Galicia, Asturias, País Vasco, Alicante, Murcia and Extremadura.[1]:74 About 23M passengers used the AVE in 2011. AVE has taken a large share of travel on the routes served: since the opening of the

line to Seville, journeys by train between the two places increased from 14% to 50%, while air fell from 11% to 4% and road from 75% to 46%.

How does the Madrid Metro and public Transportation System work?; Spain

Madrid City has a vast, safe and well-run public integrated and multimodal transport system, including the Metro Rail, Buses, the 'Metro Ligero' (Metro-Trams, LRV), '***Cercanias'*** Suburban Trains (Commuter Rail), and one Cable Car. There are also tourist sightseeing buses and night buses in Madrid, as well as taxis.

Integrated Multimodal Transport System

In Madrid, the Metro Rail, Metro-Trams, Buses and Suburban Trains come under one Transport Network. The Metro is operated by Metro Madrid, Buses by a company called EMT, the Metro-Trams by Metro Ligero and the Suburban Trains by RENFE. But all modes of transport are integrated under Madrid's Transport Consortium, known as CTM.

This means that you can buy "Metrobús" travel cards and multi-journey tickets that enable you to hop on and off the metro and buses in the Madrid urban area. And although you'll need to buy tickets separately for the 'cercanias' suburban trains and the metro-trams, you can check timetables, fares, maps and other information for all four modes of transport on the integrated CTM website.

Apart from the integrated CTM website which has fare and route information on all of Madrid's modes of transport, you can get up to date travel information on several other websites too. For metro only see MetroMadrid, for Madrid urban buses and night buses visit EMT Bus, for metro-trams the CTM website's tram page, and for suburban trains, RENFE Cercanias Madrid.

You can also view or download a metro map or a bus map directly online. For the Metro, you can additionally use the Metro website journey planner to enter your departure and destination place and time, and the system will calculate the best route for you.

Buying Tickets

You can buy "Metrobús" travel cards and single tickets for the metro and buses at CTM points of sale, at metro stations. Tickets at metro stations are usually available from vending machines, although busy central stations will have ticket booths with sales clerks. The vending machines are not difficult to operate; they offer various language options and are quite self-explanatory. In most machines you can use cash or credit cards, just be ready to punch your card's PIN number in when prompted. Buses also sell single journey tickets, but they are only valid for one journey on that bus, and cannot be used on other modes of transport.

For metro-trams(LRV) and suburban trains (Commuter Rail), which only depart from certain stations (that are usually connected with the metro), you can buy tickets at those stations. (See more information about these lines and stations below).

Tourist Transport Services

Madrid also has an open-top tourist sightseeing bus service. These red buses offer a hop-on-hop-off service, where you can buy a ticket for a day or more, and this entitles you to get on and off the sightseeing bus as many times as you wish during that period of time. The buses run along a set circuit, stopping next to or very near to all of Madrid's main sights, monuments and places of cultural or historic interest. More information is available online on bus and tour company websites, for example MadridCityTour.es, Grayline.com and GoMadrid.com.

Travel Zones, Stations and running Times

The Madrid metro and buses have four different zones: A, B1, B2 and B3. Most of the main attractions in Madrid are within zone A, and it's unlikely that you'll need a ticket to the outer perimeters unless you're going to a very specific suburban destination to visit someone, or to the airport. For sightseeing, it's recommended that you buy a 10-journey ticket for Zone A, and that will cover you for virtually all of Madrid's main monuments, sights, parks, palaces, museums and other places of interest.

For running times and stations, see the detailed information for each different type of transport below:

- **Metro** - The Madrid Metro network has 231 stations and 12 lines, but it is very easy to navigate. Each metro line has its own colour and number, and each station has a name, all very clearly laid out on the metro map. The metro is open from 6am to 1.30 am. The metro trains travel underground at high speeds, and in peak times and busiest areas they run every 1-3 minutes. The frequency of the metro trains outside rush hour or in the furthest away suburban areas is still only about 5-8 minutes, and nighttime metro trains after 11 pm run every 10-15 minutes.
- **Buses** - EMT city and suburban buses run in central Madrid and between central Madrid and the suburban neighborhoods. EMT's new fleet of buses that run on hydrogen are recognizable for their blue colour, although some diesel buses still operate, and those are red. Buses run every weekday from 6am to 9am, approximately every 5-15 minutes. The frequency will vary according to the time of day and the areas the bus lines serve; check the CTM website or EMT bus map for up to date route and timetable information.
- **Metro-Trams (LRV)** - The Metro Ligero overland Trams have four different lines: ML1 from Pinar de Chamartín to Las Tablas, ML2 from Colonia Jardín to Estación de Aravaca, ML3 from Colonia Jardín to Puerta de Boadilla and ML4 from Tranvía de Parla (circular line). The metro-tram lines ML1, ML2 y ML3 connect with the metro, and the ML 2 and ML4 with the suburban trains. The lines ML2 and ML3 connect with each other. The metro-trams run from 6am to 1.30 am, same as the metro. Check the CMT website's Metro Ligero page for more information.
- **Night buses** - The night buses (known as 'Búhos', or 'Owls') run 11.45pm onwards, until 6am. Their frequency depends on the time of night and the part of town they travel to, but generally they run every 15-30 minutes. Check the EMT interactive bus map for journey times.
- **Suburban 'cercanias' Trains (Commuter Rail)** - The suburban or 'cercanias' trains will take you to the outer Madrid areas with no metro connections. The suburban lines have 8 different zones, and the more zones you cross, the more you'll pay in fares. The 'cercanias' trains connect with the metro at certain stations: Atocha, Chamartín, Príncipe Pío, Nuevos Ministerios, Delicias, Méndez Alvaro and Pirámides. The Recoletos station in the centre also has a 'cercanias' train line platform, but is not connected via underground tunnels to the metro station nearby.

The ‘cercanias’ trains operate between 6 am and 11 pm, roughly every 3-7 minutes. Check times and routes on RENFE’s Madrid Cercanias page.

Types of Tickets

Because the Madrid metro and bus system is integrated, you can buy combined ‘Metrobús’ tickets that let you hop on and off the metro and EMT buses. The ‘cercania’s trains have their own ticketing system. There are also single tickets, which you can buy for buses, metro and trains.

Disabled Travellers

Almost all of Madrid’s metro and metro-tram stations are equipped with lifts and ramps for disabled passengers. Most buses, with some exceptions on older vehicles, have wheelchair access. Some ‘Cercanias’ train platforms have ramps and lifts, some have assistance available. You can find detailed information about lifts and ramps on the Metro accessibility page and for buses on the EMT bus accessibility page. You can check which ‘cercanias’ trains have accessibility in place here.

Taxis

Madrid taxis are white, with a red diagonal stripe and the city emblem on the front doors. If a taxi is free the green light on the roof will be on. You will usually find taxi ranks all over the city, especially near train and bus stations, as well as at the airport.

When you are near a taxi rank, you must take the first taxi in queue there, but otherwise you can just hail a taxi on the street by lifting your hand.

In 2014, Madrid taxis have a basic starting fee of 2,40 € during the day and 2,90 € by night. From then on, the taxi will run on a meter and the final price will depend on distance, time (quicker or slower in heavy or light traffic) and various extra supplements on bank holidays and during airport runs. Airport runs to Madrid’s centre have a fixed tariff of 30 €, but will carry extra charges for extra passengers in people carriers (5th person onwards), Sundays and bank holidays, and after 10 pm until the early hours of the morning.

Always get an estimate from a driver before you get in, if you are unsure, but remember that heavy traffic may increase the cost. You can also call a cab company like Tele Taxi on (+34) 913 712 131, but bear in mind that the driver will start the meter from wherever he or she is at the time of receiving the call.

Madrid Metro implemented Artificial Intelligence Ventilation System; Spain

February 28, 2019

Spain's Capital Metro Transport Operator has commissioned a ventilation system based on Artificial Intelligence aimed to reduce harmful emissions and to improve air quality in metro stations. The ventilation system has been developed and installed in cooperation with Accenture, a company specialising in this technology.

Both Metro de Madrid and Accenture applied Intelligence specialists have worked together to develop an intelligent system that will use an algorithm to identify the best ventilation balance in each metro station.

The system uses data regarding air temperature, station architecture, frequency of trains, passenger flow and electric energy price to determine the optimum level of necessary ventilation. The system includes both real and simulated data, as well as exterior and underground temperatures with three days in advance in order to achieve optimisation. The development of this system should facilitate the reduction of carbon dioxide emissions by 1,800 tonnes for Metro de Madrid. Also, the new system will contribute to reducing ventilation energy costs by 25%.

The ventilation system also includes a simulation engine and a maintenance module. It detects the operation faults of ventilators and will allow Metro de Madrid to carry out the equipment maintenance.

Metro de Madrid network has 294 km and 301 stations. Almost 2.3 million passengers use the Metro Rail in the Spanish capital every day.

SCANIA delivers 160 Gas powered Buses to Madrid; Spain

7 March 2017

News | Press releases | Regulatory press releases
Alternative fuels

As part of the complete bus renewal programme for the Spanish capital Madrid, Scania will deliver 160 gas city buses. The municipal transport company, EMT Madrid, will take delivery of 80 new buses this year with another 80 buses added to the fleet in 2018. This order is in addition to the 46 ***SCANIA* Gas powered Buses** ordered last year.

The City of Madrid has initiated an ambitious programme to improve air quality and reduce carbon emissions with the stated goal to ban diesel by 2025. Half the EMT fleet of more

than 1,500 buses is already gas powered and with the scheduled deliveries that share will be even higher.

“Thanks to lower carbon emissions and noise reduction, interest in gas-fuelled operations has surged worldwide,” says Anna Carmo e Silva, Head of Buses and Coaches at Scania. “The Scania Buses with the acclaimed Euro 6 gas engine is comparable in performance to a diesel engine. It is therefore an increasingly popular option, especially among European operators.”

The 12-metre low floor buses will be bodybuilt by Castrosua.

Alternative Fuel: Gas powered Madrid EMT Metro Bus from SCANIA

Vivarail announces Partnership with Hydrogen Fuel Cell Specialists Arcola Energy; UK

08 May 2019 | Railway-News

Vivarail, who have been working on converting old London Underground trains (Class D78) into Class 230 battery-electric multiple units (BEMUs), have partnered with Arcola Energy, which specialises in hydrogen fuel cells.

Arcola Energy is a Hydrogen Fuel Cell Specialist supplying London Suses
© CC0

Both companies share the goal of decarbonising the transport system in the United Kingdom. Arcola Energy's work in this field has been in supplying fuel cells for electric vehicles, e.g. buses. Together, Vivarail and Arcola will develop a hydrogen/battery hybrid train. In fact, hydrogen technology in trains was one of the avenues highlighted in the recent Net Zero report that the British government should support in order to become carbon neutral by 2050.

Vivarail's Hydrogen Concept Train

Vivarail believes the proof-of-concept train should start testing towards the end of this year or early in 2020. In particular, this **Hydrogen powered Hybrid Train** will build on the technology Vivarail has already developed for its Class 230 battery train.

The Vivarail-Arcola Energy concept train will have two carriages. Of these, one will house two battery modules, while the second will hold the fuel cell and tanks. All of this equipment will be below the train, taking advantage of Vivarail's modular power pack design. Vivarail has designed its Class 230 trains to work with different power sources. For example, the company is in the process of manufacturing diesel/battery hybrids for Transport for Wales. These will be almost identical in design to the hydrogen train.

Vivarail's Production Hydrogen poweredTrains

After Vivarail has demonstrated that its technology is capable, it will then manufacture hydrogen trains made up of four cars. Two of these will be battery driving motor cars, while the two middle cars will house the fuel cell and tanks.

Adrian Shooter, CEO of Vivarail, said:

"I'm delighted we will be working with Arcola, a company with very similar values to our own. We are both energetic and fast-moving organisations and believe that zero-emission trains are possible today and will be vital in helping the UK meet its carbon reduction targets. I look forward to seeing new clean, green trains on the network in the near future."

Ben Todd, CEO of Arcola Energy, said:

“We are excited to be collaborating with a fast-growing, innovative company like Vivarail that also shares our passion for making a difference on emissions and carbon reduction. The proof of concept train is a great opportunity to see our technology, already proven in road transport, make the transfer to rail to help accelerate the adoption of zero-emissions and low carbon trains.”

Also read:

- Vivarail’s Patented Fast Charge System a Success
- Vivarail to Build Upcycled D-Trains for West Midlands Trains
- Alstom and Eversholt Rail Reveal New Hydrogen Train Design for the UK
- Hydrogen Cells: How Alstom is Building on the Coradia iLint

Nürnberg receives the first G1 Siemens Metro-Train; Germany

May 9, 2019

The first Siemens Metro Type G1 Train arrived in Nürnberg, from Siemens plant in Vienna, where the G1 fleet is being built. Core components of the G1 fleet will be manufactured in the Nürnberg metropolitan area and include such products as the drive converters, traction motors, auxiliary converter units and control equipment. The project management, development and service support are provided from Erlangen.

In 2015, Nürnberg’s mass transit operator VAG awarded Siemens Mobility a contract for the supply of 21 G1-type metro-trains for the replacement of 42 DT1-type two-car train-sets. The order included additional 13 trains, divided into two options, of six and seven trains. The two options were exercised in 2018 and 2019.

The new type G1 trains for Metro Nürnberg offer wider passenger doors with innovative LED light signals which ensures reduced energy consumption. Combined with an unobstructed passageway throughout the four-car trains, these features improve the passenger flow. In addition, automatic sliding steps at all the doors ensure optimal barrier-free boarding and exiting.

The bright and friendly design of the entire interior area with its generous multifunction areas creates a subjective sense of safety and guarantees a pleasant ride. For the drivers, too, attention was paid to ensuring a high level of workplace comfort. The driver's cabin is set up to enable the driver to operate the train either standing or sitting. For service and maintenance work in the depot, a four-car train can be rapidly sepa-rated into two half trains via an automatic coupler.

The new metro-trains will operate the line U1, running from the city's neighborhood of Langwasser via the Exhibition Center and Nüremberg Main Station to the neighboring city of Fürth.

With a total distance of 18.5 km and 27 stations, the U1 line records an increased passenger flow, as on weekdays numerous commuters and students use this line.

Pesa Twist Tram Trials begin in Gorzów; Poland

May 6, 2019

In mid-April, the first Pesa tram for Gorzów (western Poland) entered tests on the section linking MZK's depot with Sikorskiego – Jancarz intersection. The trams are tested with speeds of up to 50 km/h.

In 2017, MZK Gorzów Wielkopolski awarded Pesa a PLN 115 million (EUR 26.95 million) contract for the supply of 14 three-section Twist trams, with an option for 6 additional vehicles. Twist trams are 100 per cent low-floor with a capacity of 170, including 48 seats. They replace the 18 trams fleet as part of the city's modernisation and extension project. In October 2017, tram services were suspended on the entire network following authorities' plan to modernise the network ahead of entry into service of an entire new fleet. In 2018, operations were resumed on the modernized sections. 11 route-km were modernised under a PLN 225 million (EUR 52.7 million) project, which includes 3 km extension.

City's tram network has a total length of 12 km.

Agreement signed on Hydrogene/Battery Hybrid Train Development for the UK

May 9, 2019

Vivarail and Arcola Energy agreed to develop a **Hydrogen/Battery Hybrid Train** to help de-carbonise the UK's transport system.

The concept train will consist of two carriages, one housing two battery modules and one with fuel cell and tanks, all will be underneath the train to take advantage of Vivarail's unique modular power pack design. The Class 230 trains are designed to accept different power sources, Vivarail is currently building a fleet of diesel/battery hybrids for Transport for Wales which will share an almost identical design to the hydrogen train. The concept train will be used to demonstrate the system capability and test performance. Vivarail's production hydrogen propulsed trains will consist of 4-cars, with 2 battery driving motor cars and 2 intermediate cars housing the fuel cell and tanks.

The proof of concept train is likely to begin testing at Vivarail's main manufacturing facility in late 2019/early 2020 and will be based on the technology already developed for unit 230002, Vivarail's battery train.

Vivarail has already designed and run an emission-free battery train whilst Arcola lead the market in supplying power systems for efficient fuel cell electric vehicles, primarily buses, to the UK.

Arcola has a 10-year track-record in **Fuel Cell R&D** and system engineering and has an unrivalled global network of suppliers as well as extensive experience in developing zero-emission commercial vehicles.

Arcola's knowledge of fuel cell technology and Vivarail's expertise in designing novel green traction solutions give the partnership an edge in bringing next generation hydrogen trains to the UK.

Construction Works launched for LRT-1 Cavite Extension; Philippines

May 10, 2019

Philippines Department of Transport (DOTr) launched, in Barangay San Dionisio, Parañaque City, the construction works on the LRT Line 1 Cavite extension project. The LRT-1 Cavite extension envisages the construction of a 11.7bkm line and 8 stations, of which three are intermodal stations, providing road-rail facilities. With this extension, the LRT-1 will have a total length of 32.4 km, served by 28 stations.

To formalize the start of construction works for the LRT-1 Cavite extension project, a mock-up 4th Generation LRV was unveiled during the ceremony. The section will start at the existing station in Baclaran up to Niog in Bacoor, Cavite, cutting the travel time from 1 hour and 10 minutes down to just 25 minutes. DOTr Secretary, Arthur Tugade, announced that the first five stations are expected to enter services in the last quarter of 2021.

The line will be operated by LRVs supplied by Mitsubishi Corporation, which was awarded a JPY 30 billion (EUR 243.77 million) contract for the delivery of 120 cars (30 train sets). Mitsubishi Corp will supply rolling stock manufactured by CAF, while equipment installed on the rolling stock will adopt Japanese technology and products. The mock-up LRV was delivered in January 2019, with the delivery of train sets scheduled in tranches from July 2020 to 2022.

Also, in February 2019, the contract for the expansion of the existing Baclaran depot and the construction of a new satellite depot in Zapote, Las Piñas was signed. Once

completed, both depots will increase the LRT-1's stabling and maintenance capacity from 145 LRVs to 269 LRVs.

Once fully operational, the entire line of LRT-1 is expected to accommodate 800,000 passengers daily, nearly double its current average ridership of 458,000 passengers daily.

METRO NEWSLETTERS

on

URBAN MOBILITY AS A SERVICE

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

TRANSPORTATION AND ECONOMIC DEVELOPMENTS IN MODERN URBAN/MEGAPOLIS ENVIROMENT

METRO Newsletter by Dr. F.A. Wingler
METRO 66, May 2019

Bangalore Metro Rail

PART I: ACTIVITIES AND INITIATIVES FOR URBAN MOBILITY AS A SERVICE IN INDIA

Pune and Mumbai Metros to get Communication Based Train Control, CBTC, and Signalling from Alstom; India

29 Mar: 2019 | Railway-News

Alstom has won contracts to install its Urbalis 400 solution – its latest-generation Communication Based Train Control, CBTC, Technology – on the Mumbai and Pune Metros. Specifically, Alstom will fit this solution on lines 2A, 2B and 7 of the Mumbai Metro and lines 1 and 2 of the Pune Metro. Together, these contracts are worth more than 90 million euros (101 million USD).

Mumbai Night Lights: Vikhroli-Kanjurmarg East; Mumbai © Ashwin John under Licence

Mumbai Metro Contract

The Delhi Metro Rail Corporation Ltd (DMRC) awarded the contract to Alstom for the Mumbai Metro. Alstom is to supply both the **Communication Based Train Control, CBTC,** signalling solution and a modern telecommunications system for the metro's three elevated lines. Because of the lines' combined lengths, this contract is one of the biggest signalling projects in India.

The contract's signalling component includes the design, manufacture, supply, installation, testing and commissioning of the Urbalis 400 system. It further includes the supply and commissioning of the on-board equipment for 63 trains.

The telecommunications component includes public address systems, passenger information displays, fibre optic transmission systems, CCTV and access control systems.

Lines 2A and 2B of the Mumbai Metro are under construction and should open in 2022. Line 7 is also under construction.

Mumbai © Ashwin John under Licence

Pune Metro Contract

The Maha Metro Rail Corporation Ltd (MMRCL) awarded the contract to Alstom for the Pune Metro. Alstom will supply its Urbalis 400 CBTC solution for lines 1 and 2. The signalling solution will then control 31 trains over 32km. Consequently, the trains can run at higher frequencies and speed, thereby increasing capacity without impacting safety.

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

"We are proud to have been selected by our customers for these prestigious projects. Our cutting-edge technologies will help enhance the quality of the life of the citizens of both

Mumbai and Pune and will contribute to the overall development of the cities. We are also proud to be a key partner, via these projects, in the growth of sustainable transportation in the region."

To date, the Urbalis 400 solution is in use in more than 30 cities globally.

In Conversation with Mr. Pankaj Kumar Bansal, I.A.S. on Features of Chennai Metro: *"Multimodal Integration as a Strategy" – "Seamless Integration with other Modes of Transportation";* India

April 11, 2019 Interviews

Mr. Pankaj Kumar Bansal , I.A.S

Managing Director, Chennai Metro Rail Ltd

Rail Analysis : What type of challenges were faced in the construction of the first phase of the metro project ?

Mr. Bansal : There have been several challenges which were dealt with head on during the construction and implementation of the project. Some of the challenges were.

- Limited availability of works sites, difficult situation of road traffic diversion, limited time of disposal of mucks etc
- Rationalization of existing Public Transport Systems
- Common Ticketing Solutions and Revenue Sharing
- Crossing of Flyover: Balanced Cantilever Spans
- To facilitate crossing of the Kathipara fly over near Alandur, the Elevated Corridor No.2 has 3 spans of balanced cantilever type, (Spans 59, 75 & 39 m), which were constructed without providing any temporary supports from underneath and also without disturbing the traffic

Crossing of Suburban Railway :

a) Elevated: Steel Girders across Railway Tracks at Guindy At Guindy, the Corridor –I of Phase 1 of the CMRL project passes over the existing high traffic Southern Railway Track. In view of the Heavy Rail Traffic, steel girders of span 69 m and 36 m have been provided. These are the only spans which are made of steel, all others being of concrete. Most of the critical works over the tracks were done at night after getting line blocks from Southern Railway. Stringent safety precautions were maintained at all times and no accidents occurred during the construction.

b) Under Ground: The project runs from Egmore to Chennai Central, High Court to Chennai Central, Mayday Park to Chennai Central.

These tunnels have been built in coordination with Railway Team as the tunnels pass below the Operational Southern Railway Line; Intensity Instrumentation Monitoring had been performed on routine basis during the tunnel drive.

"The tunnels have been specially designed to handle the heavy load of southern railway track, Movable trains, and future expansion of the track"

- Passing of Tunnel under/vicinity of Heritage Building etc. : Madras High court, LIC building, Ripon building, Egmore Railway Station, St.Andrew's Church etc.
- Heavy Traffic : Traffic Constraints on Logistics/Storage. Traffic Diversion Schemes were implemented in stage wise to enable construction of stations on the on-road locations..
- High Water Table Area : The alignment is located in an area of high water table and the safe implementation relied upon the effective dewatering operations
- Non-performance by some of the contractors resulted in termination and re-award of balance works.

Rail Analysis : What are the future corridors of Chennai Metro Rail and what are the expected completion timelines for the same ?

Mr. Bansal: In order to meet the future traffic demands, the expansion of mass transit corridor is an imperative. A standalone Metro System of 54.1 Km network of Phase 1 by itself, is not sufficient to address the traffic needs of Chennai. There is a case for considering expansion of Mass Transit options. Nationally and Globally, it is seen that the metro network expands progressively to cover entire city.

In this Context, Government of Tamil Nadu has planned to expand the Metro Rail System. Accordingly, the Detailed Project Report for Phase II has been prepared. The proposed Chennai Metro Phase II is covering a total length of 118.9 km and consisting of Three Corridors.

- Corridor 3 – (Madhavaram to SIPCOT) – 45.8 km
- Corridor 4 – (Light House to Poonamallee) – 26.1 km
- Corridor 5 – (Madhavaram to Sholinganallur) – 47.0 km

"As per Detailed Project report the expected time line for completion of this project is 2025-26."

Rail Analysis : Please inform us more about the Phase-2 project of Chennai Metro Rail? When will works for the phase-2 start ?

Mr. Bansal : The proposed Chennai Metro Phase II is covering a total length of 118.9 Km and consisting of Three Corridors.

- Corridor 3 – (Madhavaram to SIPCOT) – 45.8 km
- Corridor 4 – (Light House to Poonamallee) – 26.1 km
- Corridor 5 – (Madhavaram to Sholinganallur) – 47.0 km

Out of 118.9 km network, 76.3 km is elevated and 42.6 km is underground. There are 128 stations planned (i.e. 80 elevated and 48 underground stations). The Total estimated completion cost of the project is Rs. 69,180 Crores.

The estimated ridership for the year 2025 is 19.2 lakhs. The maintenance facilities for Corridor 3 and 5 is proposed at Madhavaram and a minor depot proposed at Siruseri Sipcot area. The maintenance facilities for Corridor 4 is proposed at Poonamallee. As per Detailed Project report the expected time line for completion of this project is 2025-26.

Rail Analysis : What are your plans to integrate Chennai Metro with other modes of public transport like Bus and Auto ?

Mr. Bansal : Chennai Metro Rail Limited has been advocating **Multi Modal Integration** (MMI) to ensure better mobility to metro users and the travellers using Public Transport. **Multi Modal Integration as a Strategy** has been built into the Project Design stage itself.

"Phase 1 of Chennai Metro Rail Project corridor is running along the major arterial roads and connecting Road, Rail and Air Transport hubs such as Chennai Mofussil Bus Terminus (CMBT), Chennai Central station, Egmore station, Airport."

Similarly, as part of selection of Phase II network stations; Interchange with existing Sub urban Rail, Phase 1 Metro, City Bus, MRTS, etc., at various locations. The details are as follows:

Type	Corridor 3 – (Madhavaram Siruseri	Corridor 4 (CMBT – Light house)	Corridor 5 – (Madhavaram holingnallur)
Metro-Metro	Madhavaram, KMC, Thirumayilai, Sholinganallur	CMBT, Grain Market, Vadapalani, Nandanam, Thirumayilai	Madhavaram, CMBT, Grain Market, Alandur, St. Thomas Mount, Sholinganallur
Metro-Bus	Ayanavaram, Mandaiveli, Adyar	CMBT	MMBT, Villivakkam, CMBT
Metro-Suburban Rail	Perambur, Chetpet	Kodambakkam	Villivakkam, St. Thomas Mount
Metro-MRTS	Thirumayilai, Thiruvanmiyur	Thirumayilai	St. Thomas Mount 5)

Rail Analysis : What would be the role of CMRL in future Metro Projects in the State ?

Mr. Bansal : In this context, Chennai Metro Rail Ltd is also currently planning on the phase II expansion for the length of 118.9 km with 128 no's of stations. With the completion of the entire phase 1 and also being the recipient of the prestigious Platinum Rating from Indian Green Building Council (IGBC) for all 32 Metro Stations, CMRL has added another feather to its cap.

CMRL has always been committed to achieving the intended vision and mission of the organization with highest degrees of commitment and also with implementation of several effective and **innovative techniques** for the benefit of Chennai Public and the Project. It is with great pride, It can be said that CMRL would become the face of change in the public transport system in Chennai City by providing **seamless integration with other modes of transportation.**

This interview shall be covered in our March 2019 Edition Magazine with more details on Train 18 . Click Here to advertise in the magazine or know more on the same .

Some Past Related Updates which might interest you :

March 28, 2019 : Phase-2 of Chennai Metro to be operational by 2026

March 20, 2019 : Chennai Metro Update: Tender for phase-2 to be floated by June

March 18, 2019 : Chennai Metro Update: 32 Metro Stations awarded with IGBC Platinum Rating

An exclusive Interview with Mr. E. Sreedharan and his Insights on New Metro Projects in India: *"Changing the Face of public Transport in India" – "Integrate different Modus of Traffic" "Last Mile Connectivity"*; India

March 11, 2019 Interviews

Elattuvalapil Sreedharan is an Indian civil engineer and a retired IES (IRSE) officer popularly known as the "Metro Man". He is credited for changing the face of public transport in India with his leadership in building the Konkan Railway and the Delhi Metro while he served as the managing Director of Delhi Metro between 1995 and 2012.

INTERVIEW with Mr. E. Sreedharan

Rail Analysis India: Please tell us more about your journey with the Metro rail so far. How did you get started in this industry?

Mr. E. Sreedharan : First phase of Delhi Metro project was sanctioned in August 2005 and a company was registered under the name Delhi Metro Rail Corporation shortly thereafter. An agreement was also signed with Japanese Government for financing 66% of the project cost.

The Government could not find a suitable person to head DMRC even after a search committee was set up, consisting of Secretary, Urban Development, Chief Secretary, Delhi

and myself. In Feb 1997, Japanese Government gave an ultimatum to Govt. of India threatening to withdraw from the loan commitment, if a suitable MD was not selected and posted to DMRC. The Govt. therefore hurriedly decided to post me as CMD of DMRC, I was then Chairman–cum- Managing Director of Konkan Railway Corporation. That was how I landed in DMRC as its CMD on 4th Nov, 1997. After successfully completing phase-I of Delhi Metro almost 2 years and 9 months ahead of the schedule, DMRC had the courage and vision to start Metros in other major cities of the country.

"As a result a metro revolution started in the country and today there are 15 cities in India constructing/operating Metro systems."

Unfortunately, the pace of metro construction in the country is painfully slow. While a country like China is constructing metros at the rate of 300 km every year, India is not able to achieve even 25 km a year.

In regard to metro construction, the country is almost self sufficient in all areas. Indigenisation has taken place except in the area of signalling. The construction industry therefore has very exciting and wide opportunities in India.

Rail Analysis India : What type of challenges were faced in the construction of the first phase of the Delhi Metro project ? Any interesting stories or anecdotes whilst getting the Mega project up and running ?

Mr. E. Sreedharan : When Delhi Metro was taken up, the country did not have any experienced persons for planning, designing and executing a world class Metro. The expertise was just not available and we had to therefore engage international expertise to assist us. Apart from this, there was no major hurdle.

An interesting turn of event took place when Japanese Govt. stopped funding the project following the Nuclear Bomb testing at Pokhran. Only after a threat that we would go for other sources of foreign funding, Japanese aid was restarted.

Rail Analysis India : How do you view the progress of Metro projects in India now ? What are the new opportunities Indian companies have in this sector ?

Mr. E. Sreedharan : **India is urbanising fast**. There are already 18 cities in India with more than 3 million population and further 30 cities with more than 2 million. The traffic problems in these cities can be solved only by introducing rail based metro systems which are very safe, reliable, fast and comfortable.

Unfortunately, the bace of metro construction in the country is painfully slow. While a country like China is constructing metros at the rate of 300 km every year, India is not able to achieve even 25 km a year.

In regard to metro construction, the country is almost self sufficient in all areas. Indigenisation has taken place except in the area of signalling. The construction industry therefore has very exciting and wide opportunities in India.

Rail Analysis India : What are your views about Standardization and Indigenization in Metro Rail Systems and what is the impact of the same on the manufacturing and supply chain of India ?

Mr. E. Sreedharan : Right from the start, I have always stood for standardisation and indigenisation. Unfortunately, this process was very slow.

"The Prime Minister's call for "Make in India" has certainly given a boost to indigenisation."

There are now 3 factories manufacturing metro coaches in the country. All civil works (which constitute 55% by value of a metro) all electrical works, track linking etc. all can be now handled by Indian contractors.

Rail Analysis India: Do you think RRTS corridors is another solution after Metro rail for reducing road traffic in Indian cities? What else can the cities do for smoother management of traffic ?

Mr. E. Sreedharan: The roles of RRTs and Metros are different. While metros are urban transport systems, RRTs are high speed rail connectivity to suburbs and neighbouring urban centres. Both will no doubt reduce road congestion since they have capacity of a 9 lane motor way.

For metros to become successful **last mile connectivity is important** and metro fares have to be kept low so as to attract riders from personalised vehicles. Unfortunately, the current metro policy of Govt. of India does not encourage more metros to come nor make them affordable to the common man. For smooth management of traffic, every city should have an empowered, unified urban transport authority, whch can coordinate and **integrate different modus of traffic.**

Rail Analysis India: What are your opinions about this year budget as the MoHUA has been allocated Rs 17,713.93 crore for executing metro projects across the country, which was Rs 14,264.60 crore in the previous Budget ?

Mr. E. Sreedharan : The budget allocation of MoHUA is too meagre to encourage fast expansion of metro systems in the country. Further, these allocations are misleading as most of them are in the form of “Pass Through Assistance” to facilitate availing external loans. This PTA eventually comes back to the Govt. and so the net outflow is only half of the budgeted amount.

Rail Analysis India : Any Suggestions or thoughts you would like to share concerning new Metro Projects in India and their approach towards it ?

Mr. E. Sreedharan : The country should have a sound, practical and affordable metro policy. The present policy only ring-fencing the interest of the Central Govt. If all our large metro cities are to have suitable metro net work, in the next 15 years, we have to build metros at the rate of at least 200 km a year. How this is to be achieved, how they are to be funded and how they are to be owned and operated, all need a comprehensive and deep study.

I had suggested to MoHUA about 2 years back that a high level technical committee should be set up for this purpose which will also go into the area of standardisation and indigenisation. The aim should be not to make the metro a profitable organisation but implement them fast, on time, within the estimated cost, with a fare structure easily affordable to the common man so that people switch over to the metro from roads.

Electric Buses in India: To be or not to be?; India

by Karthikeyan Hemalatha on 6 March 2019

- *India currently generates more carbon-equivalent than the threshold limit of 600 tonnes of carbon-equivalent for every gigawatt hour of energy.*
- *Beyond this threshold, priority should be given to greening the grid instead of electrifying buses – a new report has found.*

Initial costs are another restrictive factor in procuring the buses.

Bengaluru was the first City in the Country to conduct Trial Runs of e-Buses; Photo by Ramesh NG/Wikimedia Commons

Transport corporations in India are gradually junking rickety old buses that spew blankets of thick black smoke, to make an ambitious and direct leap to cleaner and sophisticated electric buses. However, experts are divided on whether the country is ready to make the shift.

Despite forming a minuscule percentage of the total vehicular population, diesel buses contribute substantially to air pollution as well as carbon emissions in Indian cities. In Delhi, for example, buses form only 2.5 percent of the city's vehicle population but contribute to over 65 percent of the city's air pollution as well as fuel consumption, according to a recent report from Niti Ayog. Experts from research organisations say this number can be extrapolated to the country as well.

To make the shift from diesel to electric, bus corporations need to find a way to finance these new technologies. Cash-strapped transport corporations across the country are looking at different financial models to bring in electric buses, including leasing from private players as well as making outright purchases using central government schemes. According to a report from Niti Ayog, the department of heavy industries has received at least 47 proposals from 44 cities in 21 states, asking for 3,144 e-buses. Recently, 40 electric buses were rolled out in Lucknow, which, according to news reports, is part of an order of 255 e-buses that Tata Motors is to supply to six State Transport Undertakings (STUs) in the country.

However, a new report – titled *"Shifting Currents: Opportunities for Low-Carbon Electric Cities in the Global South"* – from World Resources Institute (WRI) says that India is better off without electric buses at the moment – both financially and in the fight against climate change. India now generates more than the threshold level of 600 tonnes of carbon-equivalent for every gigawatt hour of energy it produces, the report found out, making this a primary reason why electric buses are not a good investment to dent the country's carbon emissions.

Is India Ready to make the Shift towards electric Buses? Expert opinions remain varied. Photo by Jpatokal at wts wikivoyage/Wikimedia Commons.

One of the co-authors of the WRI report, Michael Westphal, told Mongabay-India: "With regards to India, our main point is that if India electrified now (e.g. transport) it would actually result in higher CO2 emissions. So, India should definitely prioritise greening its electricity network over electrification. That being said, India has embarked on a great march towards renewables. It is set to reach its 2020 goal of installing 100 GW of solar by

2020. As it greens its electrical grid, India should put in place the enabling conditions for electrification. Of course, as we point out, there may be other factors to consider, such as local air pollution," he said.

"As India makes progress on its nationally determined contributions (NDC) goal of generating 40 percent of its electricity from fossil-free energy sources by 2030, the carbon intensity of its electricity will fall below 600 tCO2/GWh. How quickly this happens will depend on the rate of change in the electricity sector," he added.

Financing for e-Buses remains a major Hurdle

Despite Bengaluru being the first city in the country to conduct trial runs of e-buses, the Bangalore Metropolitan Transport Corporation (BMTC) is still not sure about how to finance these buses. The prohibitive initial costs made the corporation look for leasing options. However, earlier this month, the corporation decided to cancel its tender to lease buses. It now plans to make an outright purchase of 80 electric buses, each costing between Rs. 15 million (1.5 crores) and Rs. 20 million (2 crores).

WRI report noted that electric buses are not yet competitive with diesel buses in India. "In Bengaluru, while electric buses were estimated to generate greater profits per day ($170 vs. $93) on a per kilometre (km) basis, the price of an electric bus is about three-and-a-half times that of a diesel bus, which means a payback period of eight years compared to four years for a diesel bus," read the report.

"On the operational side, however, battery electric buses are 80 percent cheaper than diesel (0.15 vs. 0.8 $/km). Infrastructure and maintenance costs associated with each bus type were factored in to calculate a total cost of ownership that ranged from 2.61 $/km for diesel buses to 6.83 $/km for battery electric buses," the report further said. The report also estimated that the cost for electric buses will drop by 30 percent to 50 percent by 2030, making them competitive with diesel and compressed natural gas models.

Experts from other research organisations, however, disagree that India is not ready for electric buses. Both the greening of the grid and electrifying public transport need to happen in parallel, said Chandra Bhushan, the deputy director general of Centre For Science and Environment (CSE), a research and advocacy based in New Delhi.

"Our electricity is getting decarbonised rapidly. Last year, some 10 percent of the electricity generated came from wind and solar alone. The shift to electric buses need to happen as the grid goes green," he said. While the initial costs of electric buses are higher, he reiterated that operational costs are highly competitive.

Speaking to Mongabay-India, officials from transport corporations in Bengaluru and Tamil Nadu agreed that the shift will be slow and difficult despite the seemingly lower cost of operation of electric buses. These corporations are struggling to find the finances for the initial investment.

While electric buses were tested on the roads back in 2014, they are still not operational. Backing the corporation's decision to consider the outright purchase of 80 buses, N.A. Haris, chairman BMTC, said it is natural for the initial costs to be high. "Electric buses are the future. Eventually, 100 percent of our fleet will be electric. Given this, we need to invest not just in the buses, but also in training our staff – which is around 34,000. From technical staff to drivers, everyone needs to be trained. The initial 80 buses will be a pilot project," said Haris, who took over as BMTC chairman last month.

Bengaluru was the first City in the Country to conduct Trial Runs of e-Buses; Photo by Ramesh NG/Wikimedia Commons

The newly-appointed transport secretary for Tamil Nadu, J. Radhakrishnan, however, expressed concerns regarding procuring new electric buses. “We need to think about our staff and their training while buying these buses,” he told Mongabay-India.

With Tamil Nadu’s state transport corporation crumbling under its own weight, it simply cannot afford to invest in new electric buses. It was, however, the first state to sign a ‘Clean Bus Declaration’ with the C40 Cities Climate Leadership Group, a global network of 90 cities, committed to addressing climate change. The announcement came a few weeks after representatives of C40 visited Chennai and its bus depots to look at the city’s potential.

“This government will implement a project to procure 12,000 new BS-VI buses and 2,000 new electric buses at an outlay of Rs. 5,890 crore (Rs. 58.9 billion) with loan assistance from German bilateral financing agency KfW,” Tamil Nadu’s deputy chief minister O. Panneerselvam said in his budget speech.

To procure buses, the government is knocking on the doors of the central government as well as finance agencies like KfW. The state government sent a detailed project plan to the union ministry of heavy industries and public enterprises, which through its FAME (Faster Adoption and Manufacturing of (Hybrid &) Electric Vehicles) scheme, supports state governments in procuring electric buses. Tamil Nadu’s proposal is to purchase 70 buses at a cost of Rs. 1.4 billion (Rs. 140 crores), of which it expects Rs. 1.05 billion (Rs. 105 crores) from the central government, including Rs. 150 million (Rs. 15 crores) for installing charging infrastructure. The transport secretary said he is looking at all options for a line of credit. “I have meetings planned with different sources, including meetings to secure funds for the buses,” he told Mongabay-India.

Other experts say it is fundamentally flawed to look at only the initial costs of electric buses. “Transport corporations in India cannot afford to buy even diesel buses. State governments need to look at the life cycle costs of buses. By the end of their life cycles, electric buses are at least 25 percent cheaper than diesel buses,” said Daniel Robinson, Chennai city director, C40 Cities, Climate Leadership Group, adding that electric buses

have a longer life as they do not have moving parts and are not prone to structural fatigue. “In states like Tamil Nadu, electric buses make more sense as 35 percent of their power comes from renewables. By 2023, this will go up to 44 percent,” he added.

Banner Image: An electric bus in Bengaluru. Photo by Ramesh NG/Wikimedia Commons.

40 electric Buses may roll on Agra Roads soon; India

Deepak Lavania | TNN | Updated: Apr 5, 2018, 7:

AGRA: Commuters in the city will soon be able to travel by electric buses. To boost clean and green transport, the directorate of urban transport is going to start the tendering process for buying 40 such buses very soon, which will operate on popular routes in the city. The plan has been prepared under the pan-city initiatives in urban mobility component of Agra Smart City project. Meanwhile, several Chinese companies have shown an interest and have approached the authorities to get the contract for supply of electric buses. The cost of these electric buses are yet to be worked out, said officials.

According to road transport department officials, in the first phase, 20 electric buses will be delivered to Agra City Transport Services Limited. These buses will run on a trail basis for three months and if the project is successful, the process to operate 20 more electric buses will begin. The central government will bear at least 50% cost of the project, said officials concerned.

Director of state urban transport Ajit Singh said, “The electric bus service is very important for Agra as the entire city lies in eco-sensitive Taj Trapezium Zone. Soon, the proposal to purchase 40 electric buses for Agra will be prepared. **Recently, electric bus services was started in Lucknow and Kanpur and the projects became a success**.”

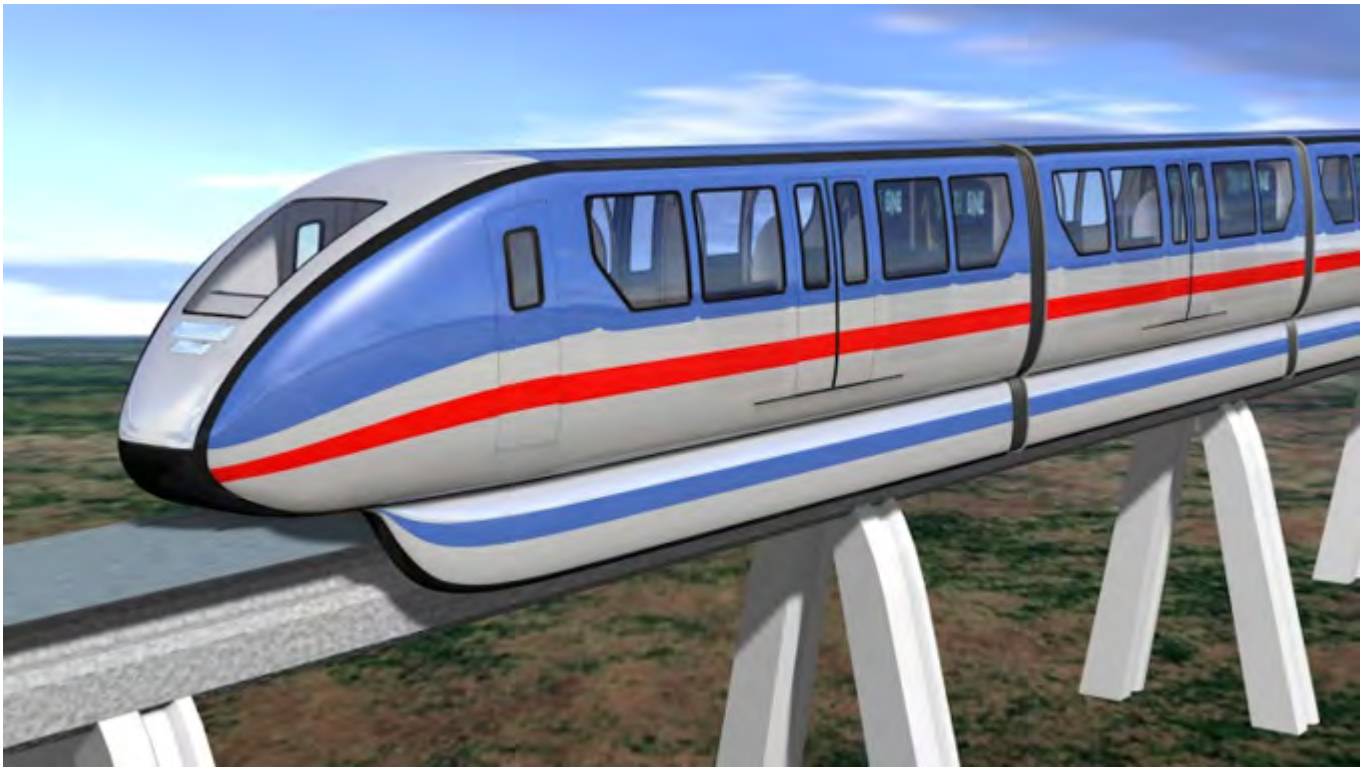
Electric buses are battery driven, and these are charged at designated charging stations. Operating electric buses means zero emission, silent operation and better acceleration as compared to buses that run on fossil fuel. With energy consumption of 1.3 kWh/km, the cost of operation of these buses is also low, compared to CNG buses.

The directorate of urban transport will finalise the routes and fare of these buses. The charging facility for buses will be provided at Uttar Pradesh State Road Transport Corporation (UPSRTC) workshops.

At present, 150-odd CNG buses run on the city roads. Electric buses will further augment the green fleet.

Agra Metro Project to be completed by 2024; India

May 13, 2019 Rail News



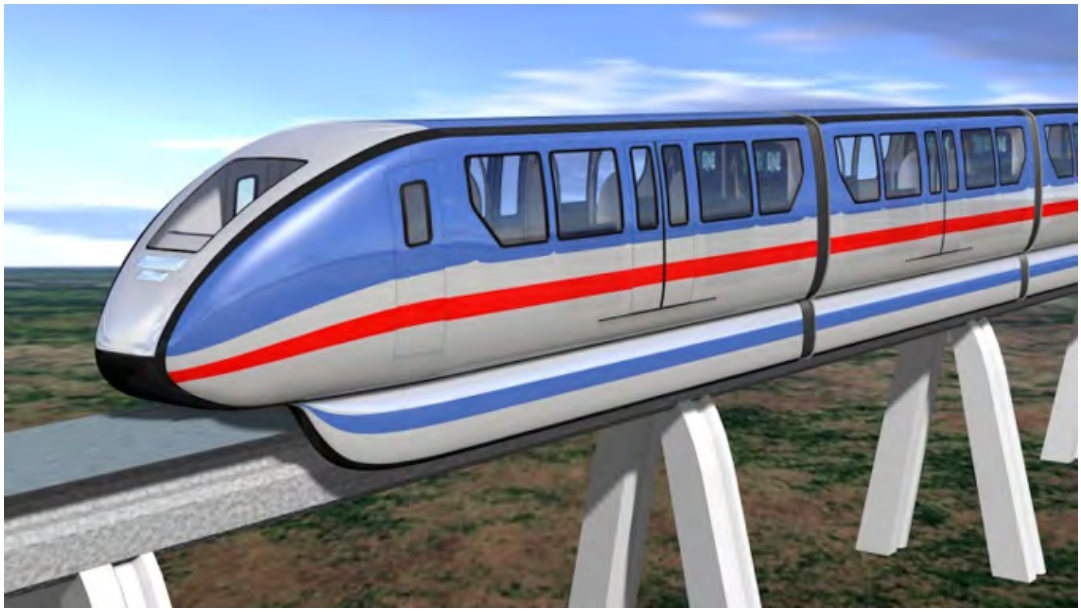
The Metro Rail Project in Agra, which is planned to be completed by 2024, will provide a boost to the urban public transport connectivity in the city. The Union Cabinet on 28-Feb-2019 has approved Agra Metro Rail Project.

More Information:

- The Agra Metro Rail Project will have 2 corridors – Sikandra to Taj East Gate and Agra Cantt to Kalindi Vihar.
- The length of Sikandra to Taj East Gate corridor 14.00 km, which is partly elevated and partly underground comprises of 13 Stations (6-Elevated and 7-Underground).
- The length of Agra Cantt to Kalindi Vihar corridor is 15.40 km comprising of 14 stations all elevated.
- These two corridors will connect prominent tourist places including Taj Mahal, Agra Fort and Sikandra as well as ISBT, Raja Ki Mandi Railway Station, Medical College, Agra Cant Railway Station, Collectorate, Sanjay Place and surrounding densely populated residential areas.

- The Metro Rail System will also promote Transit Oriented Development (TOD) which will lead to development of more residential and commercial complexes along the corridors.
- The Estimated cost of the project is Rs. 8,379.62 Crore.
- Around 20 Lakh population of the city is expected to be benefited by Metro Rail Project directly and indirectly at the time of commencement of commercial operations.
- The proposed corridors will be having Multimodal Integration with Railway Stations & BRTS Stations and will have feeder network of Bus, Intermediate Public Transport (IPT) and Non Motorized Transport (NMT).
- The residential areas along these Metro Rail corridors shall be immensely benefitted by this project, as the people of these areas will be able to travel on trains from their own neighborhoods to reach different areas of the city conveniently.
- The Metro will provide eco friendly and sustainable public transport to residents, commuters, industrial workers, visitors and travelers.
- Lucknow Metro Rail Corporation (LMRC), a 50:50 jointly owned Company of Govt of India and Govt. of Uttar Pradesh will be reconstituted as 'Uttar Pradesh Metro Rail Corporation (UPMRC)' for implementation of project.
- The financing of Agra Metro Rail Project will be partly from Government of India and Govt. of Uttar Pradesh on equal equity basis and partly as soft loan from Bilateral/Multilateral international funding agency/agencies.
- The State government has already allocated Rs. 175 Cr. for this period during the financial year 2019-20.

Agra Metro Update: Metro Rail to connect prominent Tourist Places; India



Date : March 15, 2019

Agra Metro Rail Project will have 2 corridors which will pass through heart of the city and will connect prominent tourist places including Taj Mahal, Agra Fort and Sikandra as well

as ISBT, Raja Ki Mandi Railway Station, Medical College, Agra Cant Railway Station, Collectorate, Sanjay Place and surrounding densely populated residential areas.

About the two Corridors:

1. The length of Sikandra to Taj East Gate corridor 14.00 km, which is partly elevated and partly underground comprises of 13 Stations (6-Elevated and 7-Underground).
2. The length of Agra Cantt to Kalindi Vihar corridor is 15.40 km comprising of 14 stations all elevated.

More Information:

- The Union Cabinet, chaired by the Prime Minister Narendra Modi on Feb 28 has approved Agra Metro Rail Project.
- Estimated cost of the project is Rs. 8,379.62Cr. and project will be completed in 5 years.
- The proposed corridors will be having Multimodal Integration with Railway Stations & BRTS Stations and will have feeder network of Bus, Intermediate Public Transport (IPT) and Non Motorized Transport (NMT).
- The Project will have non-fare box revenue from rental & advertisement as well as Value Capture Financing (VCF) through mechanism of Transit Oriented Development (TOD) and Transfer of Development Rights (TDR).
- LMRC (Lucknow Metro Rail Corporation), a 50:50 jointly owned Company of Govt. of India and Govt. of Uttar Pradesh will be reconstituted as Uttar Pradesh Metro Rail Corporation(UPMRC) for implementation of project.
- The financing of Agra Metro Rail Project will be partly from Govt. of India and Govt. of Uttar Pradesh on equal equity basis and partly as soft loan from Bilateral/Multilateral international funding agency/agencies.
- Govt.of Uttar Pradesh has already allocated Rs. 175 Crore for this period during the financial year 2019-20.

To know more about recent developments of Agra Metro: ***Click Here***

Some Past Related Updates which might interest you :

09 Mar, 2019: PM Modi To Lay Foundation stone for Agra Metro Rail Project

08 Jun, 2018: Agra Metro Update: LMRC Invites Tender To Engage Detailed Design Consultant For Works From Sikandra to Taj East Gate Corridor-1 of Agra Metro Project

19 Jan, 2019: DPR Approved, UP Government Decides To Start Metro Services in Kanpur, Agra and Meerut by 2024

MMRDA seeks public Consultation for Metro-6 Corridor; India

May 9, 2019 Rail News

Mumbai: The MMRDA (Mumbai Metropolitan Region Development Authority) has sought public consultation for the Lokhandwala-Jogeshwari-Vikhroli-Kanjurmarg Metro-6 corridor, according to a report. The MMRDA will hold the public consultation on May 21 at the New MMRDA office, it said.

More Information:

- Activists have been pushing for an underground Metro-6, so that the car shed for Metro-3 (Colaba-Bandra-Seepz) and Metro-6 can be integrated, which would save 33 hectares of green cover in Aarey Colony, Asian Age reported.
- The development body has finalised the terms of reference for the preparation of the EIA (Environmental Impact Assessment) report, and has undertaken preparation of the SIA (Social Impact Assessment) report, according to the public notice published by the MMRDA.
- However, activists have called out the development body for starting the work on the Metro-6 line before any public consultation.
- The work is going on in full swing at the JVLR and Lokhandwala areas.
- For long, environmentalists have been asking for a single integrated car depot for both Metro-3 and Metro-6 lines.
- If Metro-6 becomes underground, then the underground Metro-3 can easily connect with the former and the car depot for the Metro-3 line can go to Kanjurmarg.
- This will save 3,500 more trees and the flood plain of the Mithi River in Aarey.

MMRDA gears up for Monsoon, Metro Construction will not cause Water Logging; India

Date : May 9, 2019

Mumbai: The Mumbai Metropolitan Region Development Authority (MMRDA) has already geared up to face the impending monsoon, what with the Metropolitan Commissioner Mr. R.A.Rajeev ordering a team of 75 engineers to take care of the monsoon related issues as far as the five Metro Corridors that are being implemented in the city.

Along with the team of 75 engineers, 150 labourers and 30 high capacity dewatering pumps will be deployed on Dahisar to DN Nagar Metro-2A, DN Nagar to Mankhurd Metro-2B, Wadala-Kasarvadavali Metro-4, Swami Samarth Nagar to Vikhroli Metro-6 and Andheri (East) to Dahisar (East) Metro-7 corridors to deal with monsoon specific nullah and debris cleaning in the fifteen packages of the mentioned five Metro corridors.

"MMRDA will ensure the presence of one utility vehicle – at all identified spots – equipped with labourers and required machinery to prevent spillage of debris and muck coming out during drilling or piling on the roads. The teams will also be provided with materials such as paver blocks and cold mix required to fix potholes and other damages", said Mr. Rajeev.

"The teams will further ensure proper illumination wherever street light poles are removed for Metro work; the barricading will also be removed wherever the work of drilling and piling is completed. Besides maintaining regular liaison with the respective Municipal Ward Office, MMRDA teams will inspect and monitor various Metro sites daily. Our aim is to make sure Mumbaikars' enjoy their daily routine without any hindrance", Mr. Rajeev said further.

The Metropolitan Commissioner has further directed his engineering team to adhere to similar strict standards while maintaining 23.5-km long Eastern and 25.3-km long Western Express Highway. A team of ten engineers, 300 labourers equipped with 12 dewatering pumps has been deployed to clear the nullahs and potholes on both the Highways.

The teams, maintaining Eastern and Western Express Highways will ensure placement of covers of manholes, will be equipped with all machinery such as JCBs, dumpers and equipment to repair electric pumps should they fail any time. While Emergency Disaster

Response Teams for all the Metro corridors – that are under implementation – have already been established, a Disaster Control Room will also be established in the MMRDA office in the first week of June.

Source: MMRDA

To know more about recent developments of Mumbai Metro: Click Here

---

Some Past Related Updates which might interest you :

24 Apr, 2019: MMRC achieves two more breakthroughs for Mumbai Metro-3 project

11 Apr, 2019: Mumbai Metro Tender Update: Design, Engineering, Manufacture, Supply, Storage, Civil Work, Erection of Suitable Structure, Testing & Commissioning of Roof Top Solar PV Project

20 Mar, 2019: Mumbai Metro Tender Update: Design And Construction of Elevated Viaduct And Elevated Stations

Chennai Metro Update: CMRL reduces Size of Metro Stations in Phase-2; India

April 26, 2019 Rail News

Chennai: The Chennai Metro Rail Limited (CMRL) has brought down the average size of each metro station from 220 metres in the phase-1 to 150 metres in the phase-2. The phase-2 project, which is estimated to around Rs 69, 180 crore, will have 128 metro stations.

More Information:

- The CMRL would need nearly 121 hectares of land for the phase-2 project.
- Around 93.79 hectares of land is government-owned and the remaining 27.19 hectares will be acquired from private owners.
- Sources said, we made a conscious decision to primarily use government land and ensure that a minimum number of people are affected.
- Also, the project will be insulated from delays and cost overruns during land acquisition by using government land.
- Moreover, CMRL will also save the money that it would have otherwise spent on resettlement, rehabilitation, and compensation for the affected people.
- The Chennai Metro's Phase-2 project is divided into 3 segments:
    - Madhavaram to Sholinganallur
    - Light House to Poonamallee
    - Madhavaram to SIPCOT
- The phase-2 spanning around 120 kms, will be 76.3 km elevated and 42.6 km will built underground.

Construction Work for Phase-2 of Chennai Metro to begin by next Year; India

Date: April 11, 2019

Chennai: The construction work for phase-2 project of Chennai Metro Rail spanning 119 km should begin by early next year. Tenders will be called for phase-2 of Chennai Metro Rail by June or July, according to officials.

More Information:

- Since the election code of conduct will be in place soon and continue till the elections are over, the tendering process can take place only after that.
- Once the tendering process is over, it may be early January and a month or two later, the construction will begin.
- An official said, it will take around 6 years to finish the work and start operations.
- Meanwhile, the detailed design consultants have started work on some stretches.
- The phase-2 of Chennai Metro Rail is estimated to cost Rs 69,000 crore and consisting of 3 Corridors:
    - Corridor 3 – (Madhavaram to SIPCOT) – 45.8 km
    - Corridor 4 – (Light House to Poonamallee) – 26.1 km
    - Corridor 5 – (Madhavaram to Sholinganallur) – 47.0 km
- Already, a loan agreement with the JICA (Japan International Cooperation Agency) is in place.
- Also, the CMRL has an in-principle approval from the Asian Development Bank (ADB), the World Bank, and other institutions.

To know more about recent developments of Chennai Metro: ***Click Here***

Some Past Related Updates which might interest you :

11 Apr., 2019: In conversation with Mr. Pankaj Kumar Bansal, I.A.S. on Features of Chennai Metro

06 Apr., 2019: Chennai Metro commissions 428 KWp Solar Power Plants at 2 more stations

28 Mar., 2019: Phase-2 of Chennai Metro to be operational by 2026

L&TMRH Receives 'Gold Medal' for Enhancing Image of Metro Rail in India; India

May 9, 2019 Rail News

L&TMRH (L&T Metro Rail Hyderabad Ltd) has been conferred a 'Gold Medal' for enhancing the image of Metro Rail in India and globally by Institute of Economic Studies (IES) in Kuala Lumpur, Malaysia. This 'Gold Medal' is a recognition for setting an example in public transport industry and for building a unique brand identity.

More Information:

- The medal was received by Anindita Sinha, Head- Corporate Communication, L&TMRH.
- Dignitaries from USA, Europe, UAE, Singapore, China, Japan, Australia and South & South East Asia were present.
- L&TMRH CEO and managing director K.V.B. Reddy, was conferred 'Outstanding Global Leadership Award' during the ceremony.
- Reddy said,"This gold medal commemorates Hyderabad Metro Rail's exemplary service and the unique 'Brand Hyderabad' it has created. It is indeed an honour to receive the leadership award from IES. I dedicate it to the Hyderabad Metro Rail project."
- IES was established in 1980 by a group of economists, parliamentarians and industrialists, who came together to study and discuss problems concerning various aspects of the economy and economic development of the country and offer their expert advice and services.

Bangalore Metro to implement 'National Common Mobility Card' at all 62 Stations in Phase-2 - '*One Nation One Card*' for Transport and Mobility; India

May 8, 2019 Rail News

The Bangalore Metro Rail Corporation Ltd. (BMRCL) will implement the 'National Common Mobility Card' at all the 62 stations in the Phase-2, according to reports. The **'One Nation One Card'** System, in effect, can be used to make payments for all public transport.

More Information:

- The card will be linked to commuters' bank accounts.
- A senior official said, all gates at all 62 stations in Phase-2, which will be opened by 2022, will be ready to accept common mobility cards and the smart cards.
- Initially, the gates will accept both common mobility cards and smart cards, the official said.
- Meanwhile, the corporation will upgrade the existing Namma Metro gates with advanced tech as well.
- Prime Minister Narendra Modi in March this year launched the ambitious **'One Nation One Card' for Transport and Mobility**.
- Once implemented, commuters could use a single card for payments across all segments including metro, bus, suburban, railways, parking, etc.
- To avoid unnecessary disruption, BMRCL has provided Metro users with a timeline of 2 years to switch over from the current smart cards to the common mobility cards.

Bangalore Metro Update: Metro to connect Kempegowda International Airport via KR Puram; India

Date : May 7, 2019

Bangalore: The BMRCL (Bangalore Metro Rail Corporation Limited) is exploring new options for the airport metro line, according to reports. The BMRCL is considering to connect the airport line via KR Puram, Nagawara, Hebbal, Yelahanka and the Kempegowda International Airport (KIA), Bangalore Mirror reported.

More Information:

- The stretch from KR Puram to Kempegowda International Airport will be a part of Phase -B (Blue Line), it said.
- A BMRCL official said,"We need to carry out a geo survey or a feasibility survey first to study the ground level and other factors and assess if it will be suitable for metro construction. Tenders have been called for the same."
- The BMRCL also is considering the KR Puram-Hebbal line to avoid the extensive underground tunnelling work required and to take up airport work quickly.
- This would mean metro commuters can go all the way from Baiyappanhalli to KR Puram and then head towards the airport line.

To know more about recent developments of Bangalore Metro: ***Click Here***

Some Past Related Updates which might interest you :

15 Apr., 2019: Bangalore Metro Update: Land acquisition started for Outer Ring Road (ORR) line

14 Apr., 2019: Yeshwantpur railway station set to connected by Metro through a skywalk

13 Apr., 2019: Bangalore Metro Update: Metro to be extended to Anjanapura by August next year.

Visa launches ‘National Common Mobility Card’ for India; India

May 15, 2019 Rail News

Global payments company Visa on Monday announced it had launched specifications for the ‘National Common Mobility Cards‘. NCMC, also known as ‘One Nation, One Card’, is an interoperable transport card that can be used for payments across all transit segments including metro, bus, suburban railways, toll, parking, etc.

More Information:

- Prime Minister Narendra Modi in March this year launched the NCMC with homegrown payment network RuPay, as its first partner.
- In line with the guidelines laid down by the Ministry of Housing and Urban Affairs, Visa NCMC cards will allow the contactless feature to pay for offline usage at transit venues.
- The card will allow holders to store their transit passes on the card, will provide multiple ways to top-up the offline balance on the card, and it can be accepted at participating public transport operators across the country.
- “With the transit sector expected to expand with numerous upcoming metro and smart city projects, NCMC contactless cards is expected to trigger rapid adoption of digital payments across transit use cases,” TR Ramachandran, Visa Group Country Manager, India and South Asia, said.
- “Besides being cost effective vis-à-vis cash, it will also help improve the efficiency and scale of public transit systems in the country.”
- With this development, Visa plans to work closely with the government and its banks to ensure early rollout and acceptance of Visa NCMC cards.

PART II: ACTIVITIES FOR URBAN MOBILITY AS A SERVICE; INTERNATIONAL

MTA flushing Line implements Automatic Train Operation, ATO; USA

May 10, 2019

Written by Kyra Senese, Managing Editor

Photo courtesy of Marc A. Hermann

The Metropolitan Transportation Authority (MTA) New York City Transit this week completed the implementation of "Automatic Train Operation," a technology intended to enable faster, more reliable service, on the Flushing 7 Line in Queens.

MTA notes this is the second such line in the system to undergo this implementation effort, following the l line.

The completed implementation comes months following the introduction of a modern, computerized signaling system called Communications Based Train Control (CBTC) on the line. MTA said this technology has led to dramatic increases in on-time performance and other metrics associated with reliable service.

"I am tremendously proud and excited to announce that New York City Transit train operators are now running the entire Flushing Line using automatic train operation, which will make trips smoother and faster for all our customers on that line" said NYC Transit President Andy Byford. "I am so thankful to our new signals guru Pete Tomlin and the entire NYC Transit signals team, as well as our train operators who are great partners in our efforts to improve service."

Byford said he does not view it as a coincidence that the two lines with CBTC and ATO now offer the best performance in the system.

“We’re excited about what the future may bring as we explore emerging additional technologies such as ultra-wideband communications, which could revolutionize the way we modernize the system, as envisaged by our Fast Forward plan,” Byford said.

While using manual train operation methods, various train operators with differing degrees of experience control the rates of speed including braking and acceleration.

Under ATO operations, MTA notes the train is programmed to automatically provide optimal acceleration, braking and cruising speeds, providing more regular and evenly spaced service and smoother, faster trips. Operators continue to instruct the train to depart a station, ensure tracks are are clear throughout the ride and control emergency braking if obstacles are present.

Categories: News, Rapid Transit/Light Rail

Tags: Automatic Train Operation, Flushing Line, Metropolitan Transportation Authority, MTA, New York City Transit

Central/South America

Buenos Aires opens rebuilt Mitre Commuter Line; Argentina

May 13, 2019
Written by Keith Fender

ARGENTINEAN President Mauricio Macri officially opened the new elevated section of the Retiro Mitre – Tigre line on May 10, commenting in his speech that it is the first new railway viaduct in the city built in a century.

Metro Train at the new Belgrano Central Station; **Pict. by Dario Saidman**

The 3.9 km section of the 1676 mm-gauge double-track third rail electrified line in the city's suburbs has been rebuilt on concrete viaducts 10-14 m above the former track bed. The new line starts around 6km from the Retiro Mitre terminus and includes two new stations built to replace the former at-grade stations. The Belgrano Central station with 220 m-long platforms opened on May 11 while the Lisandro de la Torre replacement station will open in October.

The new elevated section of line eliminates eight level crossings and re-opens two streets that were effectively cut in half by the railway line. The project's aims to improve rail reliability and safety whilst also reducing road traffic delays caused by frequent closure of level crossings in a densely populated part of the city – around 1 million people live in the area near the line. The 30 km long Retiro – Tigre line is used by 98 trains in each direction per day, and carries 100,000 passengers, making it one of the busiest in South America.

Similar projects to elevate heavily used railway lines and remove level crossings are underway elsewhere in Buenos Aires on sections of the San Martín Railway (LSM: Retiro Line to Pilar) and the Belgrano Sur Railway (being diverted on viaduct to *Plaza Constitución* station). These are due to open in the next year or two.

Construction of the project began in May 2018 using pre-fabricated concrete sections which incorporate noise reducing barriers. Services on the existing line were maintained during most of the construction period apart from in early 2019 when train services were restricted to the northern Núñez – Tigre section.

Categories: Central/South AmericaMetrosNews
Tags: ArgentinaBuenos Aires

Urban Mobility a Feature of FS Group's Investment Plan; Italy

14 May 2019

ITALY: State railway holding FS Group Chief Executive Gianfranco Battisti unveiled an 'unprecedented' spending programme on May 10, with €58 bn to be **invested across various modes** in 2019-23.

A total of €28bn is to be spent on rail infrastructure and €14bn on the strategic road network through FS Group's ANAS subsidiary, reflecting its intention to become the largest single investor in Italian infrastructure.

While the main focus is on enhancing the country's conventional rail network and improving suburban passenger services, **a number of urban transport initiatives** are included, including €2 bn towards metro development.

FS Group says that urban rail transport will be 'reshaped' with regular frequencies on different types of services: 8 min for peak-hour urban rail services, 15 min for airport rail links, 30 min for suburban services and 60 min for regional services.

The purchase of more than 500 zero-emission buses is planned, along with around twice as many diesel buses. The €12bn investment in vehicle procurement also includes 600 suburban and regional trains, with 239 of these to arrive before 2023.

FS Group plans to invest a total of €5·3bn, with an asset value of €1·9bn, in urban regeneration, which includes improving urban transport and railway hubs.

Customer service and security is to be improved through the recruitment of 800 more employees. New initiatives would include call centres, chatbots, simplified and immediate refunds, and other digital services. FS hopes to attract an extra 20 million foreign tourists through measures such as these, as well as through better multi-channel distribution of tickets.

International Expansion

The group is to establish three 'centres of excellence' to support investment in advanced technology and digitalisation, and its wider corporate goals. These will be known as FS Technology, FS International and FS Security.

A new subsidiary is to be established for expansion outside Europe. FS reaffirmed its commitment to international growth, setting a revenue target of €2·3bn by 2023. This would come from offering 'development, management and maintenance services' for urban transport networks, railways and logistics, including specialist consultancy and staff training.

FS was already focusing on becoming a **'European Mobility Group'** after it signed a co-operation agreement with investment bank CDP in 2017 to develop urban rail networks. In June 2017 it finalised the acquisition of a 36·7% stake in Milano metro Line 5 concessionaire Metro 5 SpA, and in March 2018 it signed an agreement with Brescia Mobilità for the construction of two tram lines in Brescia. In June 2018, FS launched the Nugo nationwide **multimodal transport planning** app, which enables users to plan a **door-to-door journey throughout the country and buy one ticket to cover all the required modes**.

Related news

- 09 Nov 2018 - Brescia tram funding proposal presented
- 26 Jun 2018 - Italian state railway launches multimodal app
- 17 Nov 2017 - Italian urban rail agreement signed

Mendoza Light Rail Line extended; Argentinia

13 May 2019

ARGENTINA: Governor Alfredo Cornejo inaugurated the first extension of Mendoza's light rail line on May 6.

The 5·4 km northern extension from the city's former railway station to Avellaneda in Las Heras district adds nine stops. Services operate every 10 min, and three additional vehicles have been added to the fleet. As with the initial fleet, these are Siemens-Düwag U2 light rail vehicles purchased second-hand from San Diego and refurbished in Mendoza.

Passenger services on the first 12·5 km section started in April 2012. This runs from the former railway station southeast to Gutiérrez, serving 15 stops. A further northern extension to the airport is planned.

Related news

- 14 Mar 2014 - Mendoza light rail Phase 2 contract signed
- Previous news story

Electric buses handed over in Badajoz
Next news story
Fast tram plan for Minsk

Electric Buses handed over in Badajoz; Spain

13 May 2019

SPAIN: Badajoz Mayor Francisco Javier Fragoso attended a ceremony on May 9 marking the delivery of 15 battery electric buses from Chinese manufacturer BYD.

Transport operator Tubasa, a Grupo Ruiz subsidiary, placed the order in July 2018, as part of the city's plan to have a completely electric bus fleet. The 12 m long buses are equipped with iron-phosphate traction batteries.

The order is BYD's second electric bus order in Spain, coming a few months after an order for eight 12 m buses from Badalona.

Related news

- 15 Apr 2019 - BYD launches 'longest electric bus'
- 09 Jan 2019 - Medellín orders BYD electric buses
- 21 Nov 2018 - BYD to supply electric buses to Guayaquil
- 14 Nov 2018 - Electric minibus presented in Barcelona

Electric Minibus presented in Barcelona; Spain

SPAIN: Barcelona transport operator TMB presented a prototype electric minibus at the Smart Mobility Congress on November 13.

The vehicle has been developed as part of the RIS3CAT research project managed by Catalan competitiveness agency ACCIÓ, which is part of the region's Ministry of Business & Knowledge. The EU's European Regional Development Fund has contributed €488 000.

The bodyshell has been developed by Indcar, with an Iveco Strada chassis. Millor Battery has supplied modular batteries with a rating of 135 kWh, which power a 140 kW electric motor, giving the bus a 16 h range. Engineering services company Applus IDIADA and the Eurecat technology centre are also partners in the project.

The air-conditioned minibus is 7·2 m long and 2 430 mm wide with capacity for 22 passengers. There are eight seats and two tip-up seats, as well as a wheelchair space. After the Smart Mobility Congress, the bus is expected to undergo 4 000 km of test running before entry into passenger service on the city's Bus del Barri routes.

Related news

- 13 May 2019 - Electric buses handed over in Badajoz
- 19 Oct 2018 - Sagrada Família to fund Barcelona transport improvements
- 12 Sep 2018 - Line 10 South opens in Barcelona
- 26 Oct 2017 - VDL to supply electric minibuses to Noord-Holland

Previous news story

Mobile ticketing is coming to Madrid
Next news story
Santiago metro extension electrification contract awarded

Driving towards a digital Future, Siemens Mobility: *"Urban Mobility as a Service"*; International

08 May 2019 | by **Dr Harry Hondius**

Future of Digitalised Urban Mobility; Animation by Siemens Mobility

Siemens Mobility is providing its C2X technology for the Navya autonomous vehicles in Seestadt Aspern.

NAVYA autonomous electric Shuttle Bus, Seestadt Aspen; Austria

Siemens Mobility plans to focus on aspects of digitalisation at the forthcoming UITP Summit in Stockholm, presenting three key streams ahead of the event. (Photo: Harry Hondius)

Using the slogan 'Mobility Made Easy', Siemens Mobility has embarked on a global strategy to harness digital technologies to provide seamless transport by a variety of modes. Presenting the highlights of its plans for this year's UITP Global Public Transport Summit during a visit to Wien last month, the company emphasised its investment in firms specialising in transport planning, ticketing and information.

These include HaCon, which provides the HAFAS timetabling and planning software, now branded as a Mobility Ecosystem. The Hannover-based company employs 370 IT and transport planning specialists covering many aspects of intelligent transport systems. Siemens has also invested in Eos-Uptrade, which provides online sales systems and ticketing solutions for public transport operators throughout Europe notably those in Hamburg, Berlin, München and Wien. Meanwhile New York-based Bytemark, Inc works with 20 public transport agencies around the world offering mobile ticketing. Padam Mobility of Paris provides demand-responsive **transport-as-a-service.**

As an example of co-operation projects, Siemens says it has worked with Bytemark to provide a common payment solution for the smart travel app in Columbus, Ohio, and with HaCon to provide the BART Trip Planner in San Francisco. Siemens is now working closely with transport authorities in Luxembourg to deliver a 'complete mobility app' to support the country's free public transport initiative that comes into operation from March 2020.

Autonomous Operation

Digitalisation will also play a role in the operation of urban transport services, with Siemens Mobility working on **autonomous operation for trams and electric buses**.

During InnoTrans 2018 Siemens and ViP demonstrated autonomous driving with a modified Combino tram on a 6 km route in Potsdam. Their view is that if all traffic is operating autonomously at some point in the future, trams would have to be part of it. In the short term, the company says the driverless technologies will be perfected for shunting within the depot, before being introduced more widely.

Meanwhile, June 6 will see the launch of an **autonomous electric bus shuttle** in the new Wien suburb of Seestadt Aspern, providing 'last mile' connectivity to and from Seestadt station on metro Line U2. Siemens Austria and vehicle manufacturer Navya are partners in the project consortium along with local operator Wiener Linien, AIT, KFV and TÜV Austria.

Under the €1·5m project, two Navya shuttles will run for a year on a 2 km route serving five stops, at a maximum speed of 20 km/h, and there will be a trained attendant on board to supervise. The 4·75 m long 10-seat vehicles are powered by a 15 kW motor, which is fed from a 16 kWh battery that will enable it to operate for up to 9 h. Charging from a 16 A 220 V AC supply is expected to take 4 h to 8 h.

Siemens is supplying its C2X (car-to-X) technology which enables the autonomous buses to interact with the roadways and surrounding infrastructure. The vehicles are fitted with a range of sensors and GPS, while at key road crossings four fixed cameras are provided to relay video images to the onboard computer.

Easy Spares digitised

Siemens Mobility is also promoting its 'Easy Spares' digital supply chain concept. Back in 2000, the company introduced a programme enabling its rail vehicle customers to order parts for delivery within 24 h. This concept has been enhanced by an app with photo matching for component identification, allowing defective items such as door knobs, seat covers or windows to be identified and ordered in 3 min to ensure the 24 h delivery times.

Once photographed, the item is checked in **Siemens Mobility's cloud-based CAD database,** and experience suggests that around 90% of the parts can be identified within 10 sec. The functionality is already available for the Avenio and Neoval platforms, whose components were designed using 3D CAD systems, and will be extended to future vehicle platforms.

Related news

- 06 Feb 2019 - A more intelligent journey planner
- 22 Jan 2019 - Luxembourg minister sets out free public transport details
- 09 Jan 2019 - BART launches end-to-end journey planner for the San Francisco area
- 18 Sep 2018 - Automated tram demonstrated in Potsdam
- 15 Nov 2017 - HaCon takes majority stake in Bytemark
- 11 May 2017 - Wien to test driverless shuttle
- 01 Jul 2014 - U-Bahn and tram expansion in Wien 10-year plan

Previous news story
BYD wins further Swedish electric bus order
Next news story
Passenger service begins on Doha metro Red Line
Most read

- 07 May 2019 - First driverless Glasgow Subway train delivered »
- 29 Mar 2019 - Stadler to supply up to 354 metro cars to Atlanta »
- 20 Mar 2019 - First stage of ‘highly complex’ London Underground resignalling goes live »
- 22 Mar 2019 - Crossrail fleet sale and leaseback deal completed »
- 15 Apr 2019 - BYD launches ‘longest electric bus’ »