

key elements from other train protection systems from around the world, and the country's indigenous Anti-Collision Device. It will also in future include features from ETCS Level 2.

The Kavach system was announced in the 2022 Union Budget as a part of the Atmanirbhar Bharat initiative. Around 2000km of rail network is planned to be brought under the indigenous system to enable safety and capacity augmentation in 2022-23.

One of its features is that by continuously refreshing the movement information of a train, it is able to send out triggers when a loco driver passes a signal at danger. The devices also continuously relay the signals ahead to the locomotive, making it useful in low visibility, especially during dense fog.

While the system initially uses UHF RF, work is underway to make it compatible with 4G LTE to make the product for global markets and compatible with other already installed systems. So far, Kavach has been deployed on over 1098km and 65 locomotives in ongoing projects of the South Central Railway, and it is planned to be provided on 3000km of the Delhi-Mumbai and Delhi-Howrah corridors where the tracks and systems are being upgraded for a top speed of 160km/h.

City and urban railways

Montreal metro

Canada: Thales has been awarded a contract extension from Canadian public transport agency Société de transport de Montréal (STM) to deliver computer-based interlocking systems to a further eight metro stations. In 2018, the original contract covered the replacement of the signalling equipment across eight stations and depots.

New signalling for São Paulo

Brazil: Siemens Mobility has been awarded two contracts by ViaMobilidade Linhas Line 8 and 9 to upgrade and modernize the São Paulo metro network. ViaMobilidade is part of the Brazilian infrastructure company CCR Mobilidade. Line 8 will be provided with an automated signalling system and new electrification and traction power systems for both Line 8 and 9.

For Line 8, Siemens Mobility will design, supply, and implement an electronic interlocking (Westrace MkII) in the regions of Osasco, Presidente Altino and Imperatriz Leopoldina stations. Track improvements and ATS reallocation will also be carried out in Barra Funda station.

The 41km Line 8 (Diamond) has 22 stations, crosses six municipalities in São Paulo metropolitan region and is served by a fleet of 36 trains. It is used by around 500 000 passengers a day. The 32km Line 9 (Emerald) has 18 stations and a fleet of 36 trains, and transports 600 000 passengers a day.

Sarawak metro systems and fleet tender

Malaysia: Sarawak Metro has received two bids for the Kuching Urban Transportation System (KUTS) System Package 1 tender. This includes the signalling and control system, hydrogen-powered rolling stock, depot equipment and maintenance vehicles, and automatic platform gates. The trains be guided using an optical system and will operate at GOA 2.

A bid has been submitted by a joint venture comprising CRRC, China, and CHEC Construction (M) and KACC Construction, Malaysia, and another by a joint venture of Malaysian companies EPR (Kuching), Global Rail and Mobilus, a partnership between Ireka and CRRC Urban Traffic. Each bidder was required to include a partner from Sarawak and the contract is expected to be awarded by the middle of 2022.

Sarawak Metro has also announced it will also invite tenders for System Package 2 by the second quarter of 2022. This will include the communication system, automatic fare collection, information technology system, supervisory control and data acquisition, computerised maintenance management system and operation control centre.

The development of the KUTS Project will take place in phases, with Phase 1 involving the construction of two lines; the 28km Samarahan Line, which runs from Rembus to the city centre, and the 24km Serian Line from 12th Mile Kuching-Serian Expressway to the Isthmus. Passenger service is planned to be provided in stages from the fourth quarter of 2025.

Communication and radio

Telecoms Innovation Network

UK: The government Department for Digital, Culture, Media & Sport (DCMS) has announced plans to establish a UK Telecoms Innovation Network (UKTIN). The centre will act as an information point for telecoms companies looking to access funding or testing facilities for R&D and opportunities to collaborate on developing new and improved technologies for UK mobile and broadband networks.

The UKTIN will be run by a consortium of organisations with telecoms expertise and will support knowledge sharing and collaboration on open and interoperable network technologies such as Open RAN (Radio Access Network), which allows telecoms companies to mix and match telecoms equipment rather than having to rely on a single supplier when building or maintaining networks.

The high-level objectives for the UKTIN are:

- Make the UK telecoms R&D and innovation landscape easier to navigate in order to broaden and accelerate market deployment.
- Enable the best use of public and private investment in R&D in line with the government's objectives: this should enable knowledge to be shared more readily across industry, to create the right partnerships and minimise unnecessary duplication.
- Engage and support all organisations participating in the open networks R&D programme to ensure their activities align and inform the government telecoms and R&D policy goals, including maximising the collective benefit of government investment in telecoms R&D.
- Drive the telecoms ecosystem so as to strengthen UK capability through aligning R&D to support advanced networking technology, creating a pro-investment environment.

DCMS is now also acting to enable and support new market entrants, vendors and innovators in navigating the telecoms R&D ecosystem with a 'front door' to steer suppliers and operators to the right place to assist them in ways that will be relevant to the diversification agenda.

Public-private collaboration in Spain

Spain: Adif and Adif High Speed (Adif AV) have begun an analysis of a business model to expand their telecoms infrastructure and networks. They are looking at the viability of public-private collaboration agreements and network 'rental' in order to support the development, operation, maintenance and marketing of their infrastructure and services.

They have identified possible lines of business expansion by providing infrastructure and services to network operators or electronic communication service providers. This includes fixed and mobile broadband infrastructure, real estate, dark and illuminated fibre services, 5G and IoT connectivity.