



NHSRCL
National High Speed Rail Corporation Ltd.

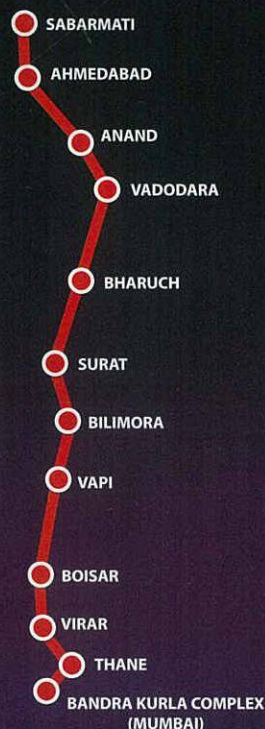
ACCELERATING INDIA'S JOURNEY INTO FUTURE

The High Speed Rail (HSR) project, steered by the National High Speed Rail Corporation, is all set to transform the train travel experience, besides boosting the infrastructure development, and providing a fillip to the socio-economic growth of the country

India's 320 km-per-hour bullet train is gradually jumping over stumbling blocks to usher in High Speed Rail (HSR) technology that promises to revolutionise journey by train. The project is spearheaded by the National High Speed Rail Corporation Limited (NHSRCL), which has been set up as a special purpose vehicle (SPV) with the participation of Central Government through Ministry of Railways, and the two state governments of Gujarat and Maharashtra.

Significantly, transportation by HSR would be powered by indigenous electric power unlike diesel/petrol and aviation fuel. This will reduce India's dependence on imports for crude oil. NHSRCL aims to effect a shift in the country's modal transport system from other modes (e.g. cars, air) or other rail services (e.g. intercity) to a highly efficient and fast network.

The project to build the country's first 508-kilometer HSR from Mumbai to Ahmedabad is based on the Shinkansen or Japanese bullet train system. Once completed, the 508km-long journey that now takes about eight hours, is expected to drop to well under three hours. By cutting down the journey time across the country in a climate friendly way, the high speed rail service will unleash the true potential of new India and will be a cornerstone in the country's journey towards inclusive progress. It is expected that the HSR will become a catalyst for India's economic growth, a stimulus for the development of satellite towns and reduction of migration to metropolises.



PROJECT HIGHLIGHTS

The high speed rail corridor will pass through Thane Creek in Mumbai, a protected sanctuary for flamingo and nearby mangroves. So, rail tracks will be made undersea through a 7 km long tunnel, a single tube with 13.2 meters diameter, ensuring no disturbance to existing ecosystem.

High Speed Rail Training Institute, Vadodara, will serve as a backbone for future development of other High-Speed Corridors in India.

Light detection and ranging (LiDAR) technology, adopted for the 1st time in a railway project in India, uses a combination of laser data, GPS data, flight parameters and actual photos to give accurate survey data for design of alignment of high speed rail corridor.

Special steel bridges, designed with stringent deflection criteria, are planned to span over existing railway tracks.

Approximately 92% of the high-speed railway track will be elevated through viaducts and bridges.

These trains will be equipped with most advanced signalling system comprising primary train detection through coded digital audio frequency track circuits and secondary detection through analog axle counters.

Signalling system will use high quality gas filled moisture-resistant ATC cables which help in quick detection of cable crack or breakage.

The train will be equipped with optical fibre cables and centrally controlled passenger information system for stations as well as onboard.



508 kms stretch between Mumbai to Ahmedabad will be covered in 2 hrs 7 mins by Bullet Train with the maximum operational speed of 320 kmph.

TRAVELLING COMFORT

The train's air tight body can maintain a positive pressure above the atmospheric pressure. It has double skin aluminium alloy in the car body, air tight floors with noise insulation, sound absorbing side covers over the bogie portion, fairings (smooth covers) between cars, noise insulation panels for pantographs etc. All cars are fitted with active suspension system to minimise lateral vibrations due to car body swaying. Seats are ergonomically designed and have ample leg space for passenger comfort. Additionally, trains are provided with features such as LED lighting, overhead baggage racks, reclining seats in all cars and seat leg rests operating in conjunction with seat reclining & reading lamps in business and First class cars.

Passengers will be able to talk with train crew by pushing a button in case of any emergency. Cars will have braille enabled information signage in the vestibule area, toilets, and other required places. One car will be provided with multipurpose room with folding bed, mirror etc. for sick persons or child feeding women and so on.

SAFETY FIRST

There will be cameras on front and rear ends of the passenger cabins and on both sides of vestibule that will record any suspicious activity onboard. The train will be fitted with most advanced crash avoidance system, automatic brake application in case of over speeding etc. It will be equipped with early earthquake detection system that will enable automatic power shutdown when primary waves emerging from an earthquake epicentre is sensed. It will be fitted with a network of sensors monitoring rail track temperature, rain monitoring and anemometers for wind monitoring.

Driving unit of bullet train, equipped with a number of display units, communication equipment and other tools, will help driver in taking prompt decisions.

SOCIAL INITIATIVES

NHSRCL provided fully-equipped modern ambulance cum mobile health unit in the tribal areas of Dahanu-Talasari Talukas of Palghar District. In coming days, skill development programme will be undertaken to ensure that the youth in tribal areas get maximum opportunities of employment. NHSRCL in association with Rural Development and Self Employment Training Institute (RUDSET), started Future Entrepreneur Training Programme for Project Affected Families.

ENVIRONMENT-FRIENDLY TRAVEL

HSR is efficient, eco-friendly, creates less noise and air pollution and uses less land for building similar passenger capacity infrastructure as compared to other transports. As the train will pass through wildlife areas and coastal regions, and also cross areas classified as forest, NHSRCL is making sure that even during construction stage of Mumbai-Ahmedabad High Speed Rail, there is minimal damage to the environment. All efforts such as sound barriers are planned so that wild life is not disturbed because of the corridor and the construction activity. There will be no disturbance to fish and other animals as complete corridor after undersea tunnel is on elevated viaducts. Without changing the location of Thane station, design of station was modified and NHSRCL has saved around 21000 mangroves.

Further, at the construction sites NHSRCL is using 'Tree Spade Technology' which ensures that the uprooted tree is taken to a new plantation site and replanted. Hence, NHSRCL is ensuring there is minimum affect to the environment.

MAKE IN INDIA

As per the agreement between India and Japan, the MAHSR Project has "Make in India (MI)" & "Transfer of

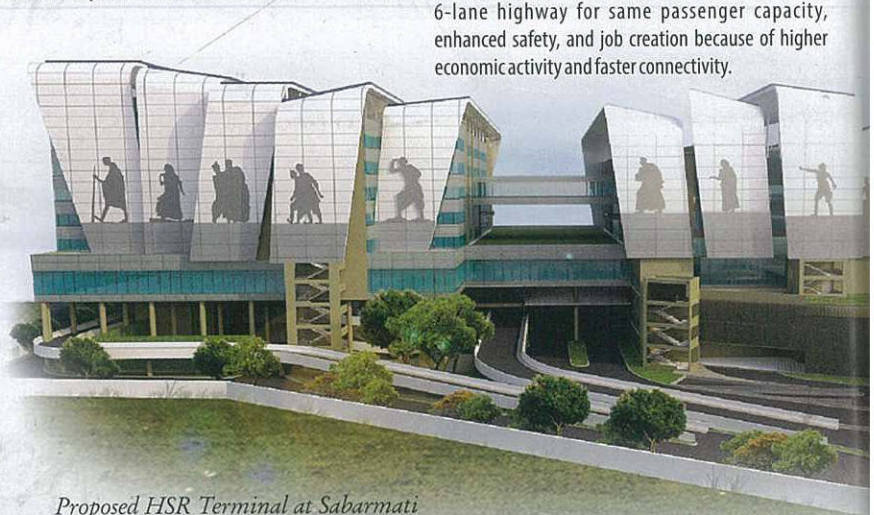
technology" objectives which are envisaged to be met through the following:

- Joint Venture between Indian and Japanese firms manufacturing in India
- Equity participation by Japanese firms in Indian firms manufacturing in India
- Japanese firms manufacturing in India
- TOT to Indian firms manufacturing in India

While Japanese firms will have access to opportunities in the big and growing Indian Railways, Metro Railways other than HSR projects, India stands to gain by assimilation of better technology, manufacturing and construction practices.

Modernisation of Indian Railways, the third largest railway network in the world, is essential to attain goals of national progress. Introduction of HSR is a significant step in this endeavour. Bullet trains would provide big boost to Indian Railways with advanced safety, technology transfer, skill development and huge influx of resources.

A virtual game changer, HSR is all set to help provide passengers with safe, reliable, and comfortable travel experience matching global standards. The project apart from being a technological marvel, would provide many quantifiable benefits. These include saving in travel time, vehicle operation cost, reduced Co2 emissions, comparatively less land required than a 6-lane highway for same passenger capacity, enhanced safety, and job creation because of higher economic activity and faster connectivity.



Proposed HSR Terminal at Sabarmati



National High Speed Rail Corporation Ltd.

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