



SwissRapide AG

Worldwide Pioneer for Ultra-Highspeed Maglev Rail Systems

Introduction

SwissRapide AG is pioneer and international leader for the planning, financing, construction, operation and maintenance of Ultra-Highspeed Maglev Rail systems (UHMR), designed to meet the growing demand for fast, reliable and sustainable mobility in cities, regions and countries around the world.

Based in Zurich Switzerland, SwissRapide actively launches, promotes and supports the development of new Ultra-Highspeed Maglev Rail projects around the globe. The company business model is unique worldwide, in that it supplies expertise and services in all phases of a given Maglev rail project, starting from feasibility studies, business cases and preliminary planning, through to the support in the acquisition of private project financing, the provision of project management, the delivery of Maglev rail technologies and associated systems, as well as providing for the construction, commissioning, operations and maintenance of the systems.

The Transrapid Maglev Rail Technology

In partnership with major international supply companies, SwissRapide provides expertise, services and systems for the proven Transrapid Maglev Rail technology, a leader in the field of sustainable Intelligent Transport Systems (ITS).

The Transrapid Ultra-Highspeed Maglev railway technology is fully developed for public use and has received **full safety approval** by the German Federal Railway Authority (EBA). Normal operating speeds are between 400 and 500 km/h, with **average speeds of over 400 km/h** between stations easily achievable, making the system twice as fast as conventional, steel wheel/rail based high-speed rail systems.

The Transrapid Maglev system has been in operation in Shanghai since January 2004, and has covered over **30 million km** and transported over **25 million passengers** to date, with operational speeds of **430 km/h** between the Shanghai Pudong International Airport and the Longyang Road station.

The following are just a few highlights of the advantages of the **Transrapid UHMR technology** over conventional high-speed railway systems:

- **Ultra-Highspeed:** 2 to 3 times faster point-to-point connections
- **Energy efficient:** 25% less energy consumption at 300 km/h
- **Environmentally friendly:** 50% less noise emissions at 300 km/h
- **Punctual:** Fully automated (self-driving) and highly reliable operations
- **Cost efficient:** 5 times lower maintenance and operating costs
- **Smart urban planning:** Flexible, elevated construction, with small curve radii and high climbing ability (10%), requires 6 times less land

The Transrapid Maglev technology is superior to the Japanese Maglev system since the cost of construction, operation and maintenance (Total Cost of Ownership) is about four times



The Transrapid Ultra-Highspeed Maglev RailSystem as planned for Switzerland

lower than the Japanese system. This estimate is based on the project costs for the Shanghai Maglev Train (SMT) mentioned above compared to the construction of the Chuo Shinkansen, the Japanese Maglev line currently under construction between Tokyo and Nagoya.

Given the full safety approval by the German EBA as well as over 12 years of proven commercial operation, the Transrapid Ultra-Highspeed Maglev system is completely ready for a first implementation in India.

The SwissRapide Maglev Rail Projects Worldwide

Currently SwissRapide is supporting and leading the following Ultra-Highspeed Maglev Rail projects around the globe:

- *SwissRapide Express East project, Zurich – Winterthur*
- *SwissRapide Express Central project, Bern – Zurich*
- *SwissRapide Express West project, Lausanne – Geneva*
- *Tenerife Ultra-Highspeed Maglev, Los Realejos - Santa Cruz - Las Américas, Spain*
- *UAE Ultra-Highspeed Maglev, Dubai – Abu Dhabi*
- *Muscat Maglev Metro, Oman*
- *Ultra-Highspeed Maglev Iran, Tehran – Caspian Sea – Mashhad*
- *Turkish Riviera Ultra-Highspeed Maglev, Antalya – Alanya*
- *Ultra-Highspeed Maglev Rail solution for the FinEst Link Project between Helsinki, Finland and Tallinn in Estonia*

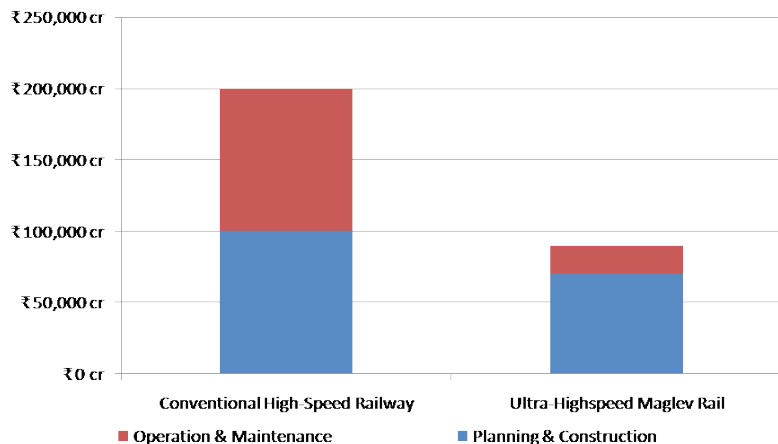


In these global Maglev Rail infrastructure projects, SwissRapide is being supported by major supply partner companies as well as by leading international financial institutions in the area of private project financing based on the company's unique Private Investment for Public Infrastructure (PI2) financing model.

- *New Delhi – Chandigarh: (260 km): 40 minutes*
- *Nagpur – Mumbai (815 km): 130 minutes*

A key to the success of Ultra-Highspeed Maglev Rail is the potential of financing the projects largely on a private basis. This is made possible by the following two factors:

Thanks to the high speeds of Maglev rail and the resulting low track



Comparison of the Total Cost of Ownership between HSR and Maglev Rail

SwissRapide Ultra-Highspeed Maglev Rail for India

Given that countries like France and Japan have been operating conventional high-speed railways for onwards of 50 years, and given the distinct advantages of Ultra-Highspeed Maglev Rail over conventional high-speed systems, the innovative Maglev rail would establish India as world leader for the new generation of fast, reliable and sustainable InterCity Maglev rail systems.

In the four projects foreseen by the Ministry of Railways in their Maglev technology call for Expressions of Interest this year, the following would be the estimated travel times with Maglev Rail for the InterCity connections, including stops at major cities between the two end stations:

- *Bengaluru – Chennai (335 km): 55 minutes*
- *Hyderabad – Chennai (630 km): 110 minutes*

occupation times, the system can be built largely on a single track basis, thus reducing construction costs.

For every 1,000 crore rupees invested in the planning and construction of a conventional high-speed line (HSR), another 1,000 crore rupees must be invested again in the first 20 years for the operation and maintenance of the line. With a Maglev system however, only 200 crore rupees are required for operation and maintenance in this time.

This results in the Total Cost of Ownership comparison above (planning, construction, operation and maintenance) in the first 20 years for a new high-speed line such as New Delhi – Chandigarh, whose planning and construction costs for a double-track system are estimated at 1,00,000 crore rupees:

This difference in the Total Cost of Ownership makes Maglev Rail projects considerably more attractive for private and institutional investors.