



Concept Study
for an
Ultra-Highspeed Maglev Train
for
New Zealand



I New Zealand Ultra-Highspeed Maglev Train Concept

The Ultra-Highspeed Maglev Train Concept for New Zealand described herein was developed by SwissRapide and proposes a fast, quiet and environmentally friendly Maglev Train system for the country. The concept foresees the following phases:

- Phase 1:** Connection of municipalities in the **Greater Auckland Region**, from **Orewa** to a number of key locations in Auckland, including the **International Airport**, and continuing on to **Hamilton** and **Cambridge**. Travel times between Orewa or Hamilton to the International Airport in **under 20 minutes**.
- Phase 2:** Connection of the **Upper Hutt** and **Lower Hutt** cities to key governmental, commercial and residential locations in **Wellington**. Travel times from Upper Hutt to downtown Wellington in **10 minutes**.
- Phase 3:** Connection of further cities and larger townships on the North Island (Te Ika-a-Māui) between **Cambridge** and **Upper Hut**, thus also providing an ultra-fast **intercity connection between Auckland and Wellington**. With this connection, the travel time between the Auckland and Wellington with the Maglev Train will be **under 2 hours**.



SwissRapide Maglev: Auckland to Wellington in under 2 hours

- Phase 4:** Connection of the major cities and larger townships on the South Island (Te Waipounamu), from **Nelson** to **Christchurch** and on to **Dunedin** and **Invercargill**. Typical travel times between Nelson and Invercargill in **2 ½ hours**.

An essential aspect of the SwissRapide Maglev Train Concept for New Zealand is that the **same Maglev technology and trains** can be used seamlessly for both the suburban sections of the system, for example in the Greater Auckland and Wellington Regions, as well as for the ultra-highspeed sections between major cities.

The Ultra-Highspeed Maglev Train System will bring the following **advantages** to New Zealand:

- ✓ Provide a **unique, environmentally friendly world-class mass transit system** for the citizens of and visitors to New Zealand
- ✓ Provide **fast and reliable connections** between major cities and townships in the country
- ✓ **Increase New Zealand's turnover from the tourism industry** by making travel in the country more attractive
- ✓ Significantly **reduce** New Zealand's **greenhouse gas emissions**, making a major contribution to the country's **Zero Carbon bill**
- ✓ **Reduce traffic congestion and its associated costs** in the Greater Auckland and Wellington Regions
- ✓ **Reduction in the costs caused by road accidents**
- ✓ **Reduce the need for additional road construction** in the coming decades.

The proposed routes and stations listed on the previous page are a first approach proposal by SwissRapide for a Maglev Train system for New Zealand. The initial planning of routes and stations for each phase of the NZ Maglev Train Project will be carried in coordination with the national and municipal planning authorities within the scope of the development of the Feasibility Study for the Project.

Based on extensive experience of SwissRapide experts with metro and high-speed railway systems worldwide, the concept for New Zealand also foresees that the Maglev Train stations will be connected with other modes of transportation such as taxis, buses and self-driving cars, thus enabling passengers to reach their final destination quickly and easily.



SwissRapide Design of a Multi-Modal Maglev Train Station

II Project Financing

At SwissRapide, we propose to finance the New Zealand Maglev Train Project via the PPP (Public Private Partnership) financing model, including a significant portion of the funding provided in the form of **Foreign Direct Investment (FDI)**.

Within this context, SwissRapide proposes to establish a **Special Purpose Vehicle (SPV) Company** in New Zealand, which will be responsible for the project financing, planning, construction, operations and maintenance of the Maglev Train system. This model has been successfully used in other large railway infrastructure projects worldwide, such as the Gotthard and Lötschberg AlpTransit Base Tunnel projects.

Since the New Zealand Maglev Train system would also be operated and maintained by the SPV Company, the company has a vested interest in minimising the **Total Cost of Ownership** (design, construction, operation & maintenance) while providing high-quality service to its customers.

- The Maglev Metro Train system can go **into operation faster by several years**, since lengthy public tendering processes can often be avoided.

In order for the PPP financing model to be successful, two key **framework conditions for the project** are essential:

- A comprehensive **Feasibility Study**, including a detailed Business Case for the Project should be developed as soon as possible.
- The municipal and national governments must be prepared to **acquire the land necessary** for the Project.

The SwissRapide Maglev rail systems are particularly suited to be financed via the PPP Model since the Total Cost of Ownership is up to 40% lower than conventional wheel/rail metro and high-speed railway technologies.



III SwissRapide Maglev Rail Systems

As is becoming evident in many projects around the globe, the **conventional wheel/rail railway systems have several major disadvantages:**

- ❖ The **costs of maintenance are very high** (in 20 years they are **equal to the investment costs of the line construction and vehicles** of the given high-speed line).
- ❖ Due to the complexity and large number of technical systems, system breakdowns frequently occur leading to **poor system punctuality**.
- ❖ System designs often do **not allow expansion of the system** to provide more capacity as demands increase.
- ❖ Conventional railway systems suppliers and lobby organisations often promise more than they can deliver.

It is because of these inherent limitations that the German, in cooperation with German and Swiss industry partners, started the development of the **Transrapid Maglev (magnetic levitation) Rail Technology** in the 1970s.

The **Transrapid Maglev Rail System** is the most **ground-breaking innovation** in railway engineering in the last 50 years. It hovers in the air instead of rolling, and thanks to **magnetic levitation** the vehicles have **no contact with the guideway**. This allows the system to be highly efficient and enables speeds of up to 500 km/h. All accelerating and braking is done purely electrically, allowing the **recuperation of braking energy**.

The **Transrapid Maglev Rail Technology** has the following **advantages** over **conventional railway and metro systems:**

- ✓ **80% lower Operations and Maintenance Costs**
- ✓ **20% less energy required**
- ✓ **50% less noise emissions**
- ✓ **Highly reliable, fully automated system**
- ✓ **Highly robust system in heat and sand**



IV SwissRapide Maglev Train Systems Supply Partners

SwissRapide has partnerships with more than 10 major manufacturers and suppliers for the subsystems required for the New Zealand Maglev Train Project, including the following:

- ABB Power Grids Ltd., Switzerland and New Zealand
(Linear Motor and Station Power Systems)



- CRRC Qingdao Sifang Co. Ltd., China
(Maglev Trains)



- ZTE Italia S.r.l., Italy
(Telecommunication Systems)



- Polycab India Ltd., India
(Cable Systems for the Power and Telecom Systems)



- Thales Group, Ground Transportation, Canada
(Autonomous Maglev Train Operation Control System)



- Afcons Infrastructure Ltd., India
(Maglev Guideway Elements)



Since the construction of the Maglev lines as well as the architectural design and construction of the stations for the Project represent a major portion of the Project budget, we intend to **cooperate with local partner companies in New Zealand** for these.

With this strategy, we estimate that more than 60% of the Project budget will be turned over in New Zealand, and will **create thousands of permanent, long-term jobs** in New Zealand as well as provide a **significant economic boost** for the country.

V Contact



Head Office

SwissRapide AG
Technoparkstrasse 1
CH-8005 Zurich
Switzerland

Investor Relations:

Niklaus H. Koenig
President and CEO
Tel. +41 44 540 77 77
info@SwissRapide.ch
www.SwissRapide.com

Court of registration: Canton of Zurich
Registered company number: CH-020.3.032.923-6