

The SwissRapide Express[®]: Progress and Economical Aspects

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ABSTRACT: Based on the Transrapid Maglev technology, the SwissRapide Express will link the major cities north of the Alps in Switzerland with connections 3 times faster than today and with services every 5 minutes in peak hours. A unique financing concept has been developed by SwissRapide AG with the aim to finance the SwissRapide Projects to 100 % via the private sector.

1 INTRODUCTION

Already today, intercity travellers in Switzerland are faced with crowded trains, regular delays and missed connections as well as traffic jams on the main motorways – valuable time which is lost when commuting, particularly on the east-west corridor **St. Gallen - Winterthur - Zurich - Berne - Lausanne - Geneva**.

The principal reason for these transport problems is that the railway and motorway infrastructure along this route, one of the most frequently used transport corridors in Europe, has **reached its capacity limits**.

The Swiss are famous for their avid use of trains, they travel more kilometres per capita than any country in the world. Through this, and the dense public transportation services offered in the country, it is expected that the **demand in mobility will increase further** the coming years.

As an example, the number of travellers on the Swiss Federal Railways (SBB) network has **increased by 7% p.a.** between 2005 and 2009. Looking into the future, the Swiss Federal Railway SBB forecasts a **growth of 60 to 90 %** on the above mentioned lines by 2020. How are these transportation needs to be met?

2 THE SWISSRAPIDE PROJECTS

It is for these reasons that the **SwissRapide Express[®]** project was launched in 2006 - an innovative solution for the creation of new intercity transport capacity and greatly improved quality of service for travellers in Switzerland.

Based on the **Transrapid Maglev** transport system technology, which has been successfully in operation in Shanghai since 2004, SwissRapide AG has recently expanded the scope of the **SwissRapide Express[®]** and now has three initial lines in Switzerland in the planning phase:

- **SwissRapide Central** from Berne to Zurich
- **SwissRapide West** from Lausanne to Geneva
- **SwissRapide East** from Zurich to Winterthur

With the **SwissRapide Express[®]**, a new dedicated high-speed intercity system will be constructed, which will be **3 times faster** than today's travel time between major cities in Switzerland and will offer service **every 5 minutes** in peak hours.

As an example, the **SwissRapide Express[®]** will **cut almost 40 minutes** off today's travel time between the cities of Zurich and Berne, covering the 115 km in **20 minutes!**



Figure 1. The SwissRapid Express® and the new Prime Tower in Zurich

In the long term, it is planned that the SwissRapid will extend along the entire east-west corridor from **Geneva** to **St. Gallen**, including connections to **Basel** and **Lucerne**.

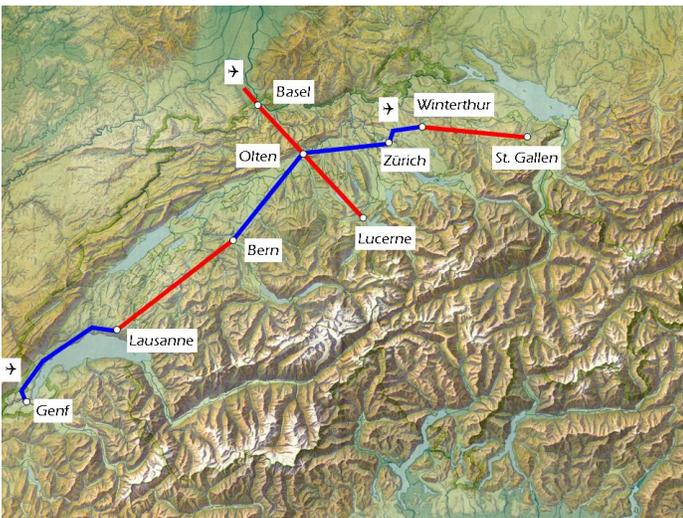


Figure 2. SwissRapid Express® Net Plan with initial lines (in blue)

Through SwissRapid, at least **6 times more capacity** will be made available for intercity travellers compared with today's railway service. In addition, by moving intercity traffic to a new, dedicated system, additional capacity will be made free for regional and cargo traffic on the existing railway network **without the need for new infrastructure investments**.

3 INNOVATIVE FINANCING MODELL

The SwissRapid Express® project is to be financed via the innovative **Private Investment for Public Infrastructure (PI²) Model**, developed by Swiss Railway Engineering SRE GmbH in Zurich.

In contrast to the PPP (Public Private Partnership) concept, the **PI² Model** foresees that an infrastructure project is launched as a **private or public initiative** but is financed to **100 % by private investors**. The following are some of the advantages of **PI² project financing**.

- All planning, construction and operational costs are covered by the **operational revenues**.
- **Premium public infrastructure** is made available without demands on taxpayer funding.
- Since construction and operations are carried out by the same private organisation(s), there is a high motivation to **optimise the life-cycle costs**.

Government organisations support a **PI² Project** in partnership with the private companies and investors as follows:

- Provide political support for the project
- Issue approvals, permits and licences
- Provide backing and support for land acquisition

A **PI² Project** differs from a **Public Private Partnership (PPP) Model**, which is generally launched by a government organisation which then looks for private investment partners who normally provide partial financing for the project.

The PPP model has been utilized in several transport infrastructure projects worldwide in the last decade, for example, in the **Øresund Rail/Road project** in Denmark/Sweden, in the **HSL Zuid High-Speed Rail project** in the Netherlands, the **Diabolo Rail project** in Belgium and the **Portugal High Speed Rail project**.

However, conflicting political interests within PPP projects have often led to serious problems in the construction and operation of the given infrastructure.

4 BUSINESS PLAN SWISSRAPIDE CENTRAL

The business plan [1] for the SwissRapide Central project between Berne and Zurich is based on the **Private Investment for Public Infrastructure (PI²) Model** described in the section above.

According to the detailed project financial plan [2], the planning and building costs for the line Berne - Zurich are estimated at **CHF 9.7 billion** (€ 7.8 billion).

For venture capital investors who want to promote **sustainable, cleantech** projects, SwissRapide offers a unique investment opportunity with highly attractive returns.

As illustrated in the following graph, during each development and approval phase of the project, SwissRapide AG shares will gain significantly in value.

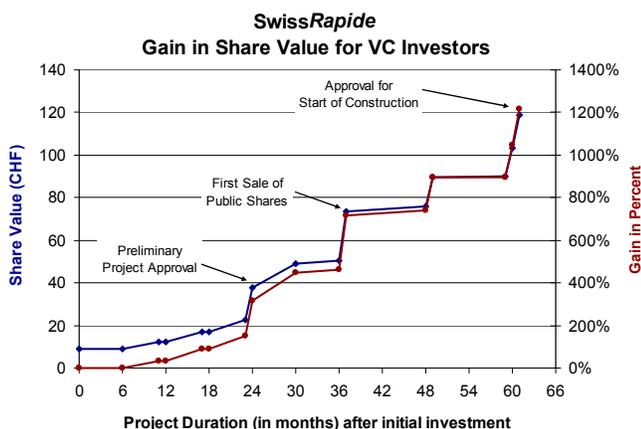


Figure 3. SwissRapide Share Value Development

Once SwissRapide is in operation, the detailed financial analysis from the Business Case, calculated until 2050, shows that the **SwissRapide Express is highly profitable** and very attractive for long-term investors.

With a moderate growth of only 4% p.a., the total number of intercity passengers by 2020 will amount to over **17 million**, which is **60 % more** than today (2010). With an average ticket price of CHF 40 one-way (€ 32), the potential revenue during the first year of operation in 2020 amounts to **CHF 720 million** (€ 576 million).

Assuming a bond/equity split of 75/25 and deducting operating costs of CHF 140 million (€ 112 million) as well as depreciation of CHF 25 million (€ 20 million), SwissRapide will generate interest payments of **CHF 440 million** (€ 350 million) and dividend payments of **CHF 146 million** (€ 115 million) during its first year of service.

Taking a Growth Fading Factor into consideration after the first year of service, passenger growth is calculated to reduce to 4% p.a by 2023. Furthermore, taking into account that ticket prices are expected to increase at 2 % p.a., by **2030** revenues will rise to **CHF 1,360 million** (€ 1,100 million). The coupon rate of the SwissRapide bond issue will be fix at 6% p.a. In addition, it will be possible to settle this bond issue after the first 16 years of operation. By 2028 dividend payments will increase to **8.5%** and by 2041 to **12%** of total investments.

The following chart illustrates the development of gross income, asset reserves as well as interest and dividend rates until 2050 for SwissRapide Central project based on the project Business Case:

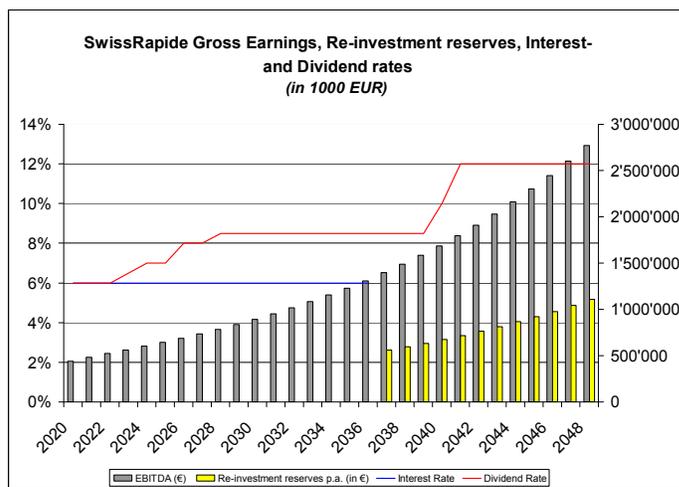


Figure 4. SwissRapide Financial Model

The financing model of SwissRapide Express meets the needs of institutional investors for **steady income streams** and equity investors for **high returns on investments**. For this reason, discussions held with financial institutions have confirmed that a **100% private financing is highly feasible**.

For investors, SwissRapide also represents an opportunity to be part of one of the most **innovative** and **ground-breaking** projects in the world in the next decades.

5 ECONOMIC BENEFITS

The *SwissRapide* Project also delivers significant economic benefits for Switzerland since it is the aim of SwissRapide AG that over **95 % of the planning and construction costs** be turned over within the country.

With a **Total Economic Impact Factor of 2.25**, the project investments in the line Berne - Zurich alone will generate over **20 billion CHF in cash flow** (€16 billion) by the end of 2020 and through this, will create over **10'000 new, permanent positions** in Switzerland.

6 CONCLUSION

The *SwissRapide Express*[®] is a private pioneer initiative lead by SwissRapide AG.

In addition, the *SwissRapide* projects are being actively supported by the **SwissRapide Consortium** as well as by over **40 partner companies and universities** in Switzerland and Germany.

SwissRapide AG together with its partner companies and organisations are actively working toward achieving their aim of becoming the **first Maglev intercity line in the world**.

7 REFERENCES

- SwissRapide AG, “*SwissRapide Express*[®] Business Plan”
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SwissRapide AG, “*SwissRapide Express*[®] Finance Plan”
February 2011.