

# **Swissmetro and Switzerland: a trend analysis**

**(Swissmetro et la Suisse en prospective)**

Project F5a of the  
National Research Programme (NRP) 41  
'Transport and Environment'

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Publisher:

National Research Programm NRP 41:  
Transport and Environment  
Bern, 2000

## Summary

### **Evaluation of the project in its context**

The objective of this study is to evaluate the possible spatial effects of Swissmetro. This study places us in the position of innovators from a methodological point of view: preliminary evaluation (ex ante) of this project for a very high-speed underground train.

In order to develop this method, we compared ourselves with the work of Plassard and Offner, known for their evaluations after a project has been carried out (ex post), concerning the effects of the TGV in France. We took as a starting hypothesis their observation according to which a transport infrastructure has no automatic effects. These effects are produced by interaction with the social and spatial context into which the new transport service is to be inserted. Depending on this future context, Swissmetro should have a very different impact, as our scenarios illustrate. This infrastructure, in connecting major urban centres at high speed will make an impact chiefly on the regular functioning of Swiss cities and will contribute to forming the future outlines of Swiss urbanisation.

### **The origins of Swissmetro**

The original idea is simple: taking into account Swiss topography, urbanisation and decision-making processes, the construction of a high-speed train cannot be carried out at surface level like elsewhere in Europe. Therefore we have this project of a high-speed train, based on four relatively new technologies, the combination of which is an innovation.

The idea is to have an underground train in two parallel tunnels. Two underground routes are envisaged, one between Geneva and St.Gallen, the other between Basle and Lugano.

The tunnels would be maintained airtight with a pressure equivalent to that at an altitude of 15,000 metres, in order to diminish losses of energy due to friction.

This train would be equipped with linear electric motors, with one of the two elements connected to the rails, the other on board. Like the German Transrapid, the dynamics of the train are obtained by magnetic repulsion (Maglev technology).

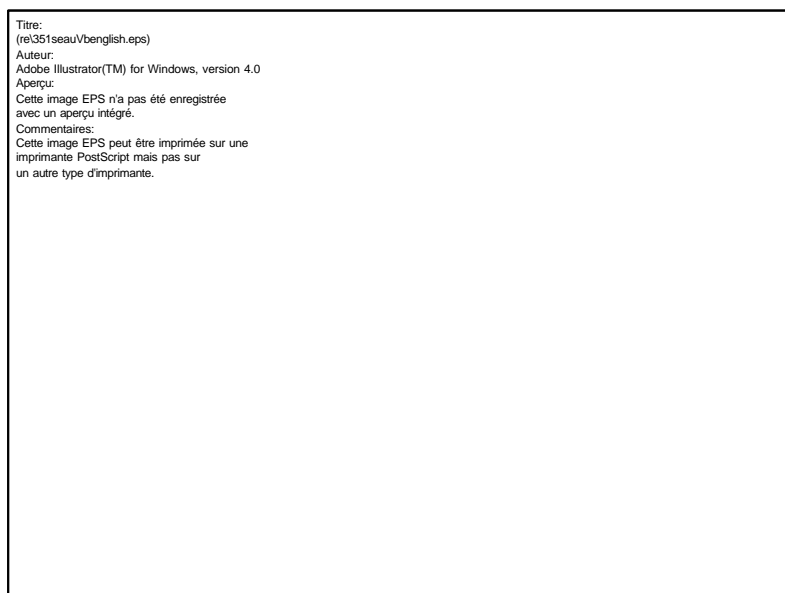
The application for a concession, made in 1997, resulted in the granting of a time extension in 1999. This decision shows the impossibility of a financial commitment on the part of the Confederation at the level foreseen by Swissmetro SA, but it also demonstrates the will not to bury a project which is expected to correspond in the future to strategic aspects of transport policy in Switzerland.

As for the prospect of actually carrying out the Swissmetro project, taking into account the uncertainties in matters of technology, and also considering the commitment of Switzerland to the Rail 2000 project, an entry into service before 2030 seems to us neither realistic nor desirable. The implementation of a revolutionary technological project such as this one requires deeper consideration than for most projects in terms of technological transition; from classical rail transport to Maglev technology.

## A test network

According to our hypothesis, the effects of Swissmetro are produced by interaction between the social/spatial context and the properties of the transport network (increased accessibility, places served). The best way of illustrating the weight of the social/spatial context consists in comparing the effects of a transport network with unchanging characteristics in various social/spatial scenarios.

While the ORL tested the spatial effects of Swissmetro in 2 scenarios (growth and duration) and according to 4 different Swissmetro networks, we are testing the effects of Swissmetro in the 5 scenarios according to variant B of the network. This network is particularly informative in terms of the spatial effects of high speed; it allows us to illustrate in an optimal manner the processes concerning spatial effects.



## The field of possibilities

On the basis of reflections on the processes concerning spatial effects, we have quantified the effects of Swissmetro on the distribution of jobs and population throughout Switzerland. The two figures in the annexe allow us to compare the spatial distribution of jobs and population in the basic scenario for 2050, without Swissmetro, and the same distribution once Swissmetro has been brought into the scenarios. This is what we define as the spatial effects of Swissmetro.

These results presented in a synthetic manner in the table below reveal "the field of possibilities" regarding the spatial effects of Swissmetro. In these scenarios, with various social/spatial contexts, the "axiom" of high speed, that is, a tendency to concentrate high-value economic activity in areas catered to by transport services, emerges in different ways:

## Spatial Effects of Swissmetro (5 scenarios)

Scenarios	Spatial Effects of Swissmetro
Dynamic and open growth	Favours the gap between urban centers and peripheral areas, but does not deepen regional differences.
A rich and solitary Switzerland	Reinforces the Greater Zurich area in particular.
The tendency scenario or uncertain future	Favourable to large international centres, built-up areas on Lake Geneva and Zurich more than other urban centres.
A Switzerland with sustainable development	Concentration in city centres and the surrounding areas become less attractive. Favourable to the balance between regions.
Old and declining Switzerland	The effects concentrate a lot of activity in Zurich, the only centre able to attract tertiary activity in this economic context marked by recession.

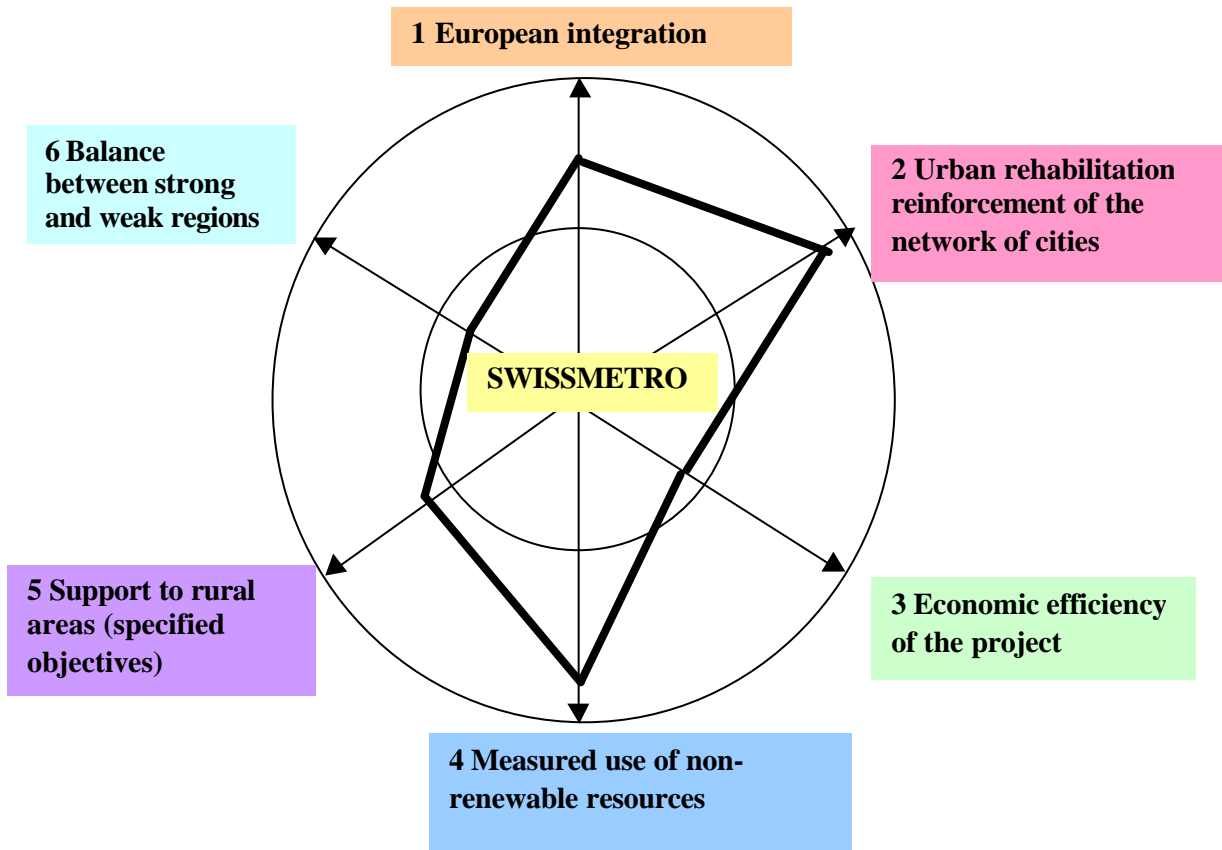
### Major trends

Given the sites of Swissmetro stops and the congruence of the project with urban development, Swissmetro should reinforce the tendency to concentrate activity in large Swiss cities. According to the scenario, this concentration will affect above all the centres of cities and also their surrounding areas if a strong trend in economic specialisation and a lack of land for building are latent in major urban centres (competition for space and high-value economic activity).

Swissmetro is also an instrument for networking major Swiss urban centres. According to the scenarios, this networking could reinforce regional inequalities and benefit certain urban regions, particularly Zurich, at the expense of other regions. In a context of specialised and complementary economic development on the other hand, Swissmetro could contribute to the development of synergism between the economic activity of major Swiss centres.

As for the areas not served by the Swissmetro network, it is not only because of the absence of stops, in other words the tunnel effect, that small and medium-sized towns as well as peripheral regions cannot profit from the project. Even more than the service provided, it is local economic specialisation which is decisive in the ability of an area to profit from the high speed. As for possible links to Sion (from Lausanne) and Chur (from St-Gall), envisaged in the Swissmetro application, it seems that accompanying measures would be preferable. They would surely have more impact on local development and at a lower cost.

**Evaluation according to the objectives of territorial organisation**



Evaluated according to the criteria of territorial organisation proposed by Güller and Güller (1998), the Swissmetro project therefore appears generally positive, without however satisfying all parties, especially in rural areas in Switzerland. This ambivalence is linked to the manner in which the territorial objectives are formulated.

Swissmetro cannot act directly to benefit peripheral areas and the infrastructure spending which this project would bring even carries a risk of working against them. However, through accompanying measures, its role can turn out to be positive, even for areas not served by Swissmetro. This would imply breaking away from the logic of levelling out a balance (see 6<sup>th</sup> objective) automatic in all types of areas. It would therefore be a matter of drawing up specific territorial strategies, which is what the major lines are proposing for the various types of rural areas (5<sup>th</sup> objective), according to both the potential already existing and that to be developed.

### **Swissmetro underlines the major stakes in Swiss territorial organisation**

On the territorial and geopolitical level, this project provides a great deal of insight and brings up several decisive questions:

- The first has to do with federalism. The lack of a federal role concerning the planning of transport projects could prove an impediment to the completion of a Swissmetro network effective both in a territorial and an economic sense. The difficulties encountered by the Confederation in constructing new routes through the Alps illustrate the hazards of negotiations between the cantons and the Confederation. In the realisation of a project such as Swissmetro, based on a limited number of services there is a danger of triggering opposition from small and medium towns, important on a cantonal scale, but not served by Swissmetro. Carried out according to an exclusively economic logic, the Swissmetro project could create unwanted effects. It could deepen Swiss regional inequalities and compete with other transport services. However, as our scenarios show, and in particular in certain contexts of public-private partnership, Swissmetro could have a complementary role to other systems of transport in terms of territorial organisation.
- Swissmetro, while it favours the networking of large urban centres, relativises the validity of the concept of a network of cities as it is formulated in the Report of the Federal Planning Office, the "major lines of organisation of national territory" (1996). This principle of territorial organisation indistinctly associates large and medium-sized Swiss urban centres and encourages them to function as a network. Swissmetro, but also economic reasoning has a tendency to widen the gap between large economic centres and medium-sized ones.
- Finally, the Swissmetro project feeds the debate on regional balances. Does the desire to establish an equilibrium between central and peripheral regions in Switzerland require redistributive equalisation, that is to say local creation of wealth which would then be redistributed, or an egalitarian policy eliminating any project liable to increase divisions? According to the former definition, Swissmetro can play a constructive role in Swiss territorial organisation. According to the second option, Swissmetro would be considered an obstacle to regional balance.

In the light of these stakes, we advise that the decision whether or not to construct Swissmetro should be taken according to the social/spatial context. According to the scenarios, the high-speed project is much more up to the task of favouring desirable spatial developments than others. It will therefore be a matter of instrumentalising this transport project in order to arrive at the desired territorial effects. Such a process of implementation will not work without active participation of public decision-makers in the definition of this transport project which is also a social project in many ways.



