„Electronics instead of concrete and tracks!“
The Swiss Federal Railways 1970-2000: Paths of Innovation of a Public Enterprise in the Era of Customer and Service Orientation and Economic Liberalization[1]

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Summary

In the 1960s, European railways experienced a dramatically growing competition by car and air traffic. Automation, rationalization and high-speed were the main ingredients of the railway reform projects from the 1960s onwards. Cybernetics and its concretization in computing, telecommunication and safety technologies, new traction systems and the building of new lines were supposed to enable an international „railway renaissance“. The Swiss Federal Railways adopted a moderate high-speed model, combining an innovative cyclic timetable with a supply concept called „Railway 2000“ which offers more frequent and faster connections on the whole net. The paper focuses on the path dependencies the Swiss Federal railways had to deal with in the 1970s and 1980s and which influenced their main managerial and technical innovations.[2]

Railway renaissance thanks to cybernetics and high-speed traffic

„A very interesting speech“, the Basle „National-Zeitung“ commented on the lecture railway engineer Oskar Baumann had held on December 6th 1969 in Lucerne.[3] The newspaper reported on the future prospects the head of the research office at the Swiss Federal Railway (SBB) [4] had designed at a conference in the Swiss Transport Museum. To the public, some of his ideas about the paths the SBB should undertake to enter the new millennium sounded spectacular. The „Neue Zürcher Zeitung“ presented their readers a resumé of the speech due to the novelty character of Baumann’s suggestions.[5] They can be resumed with the keywords „automation“, „rationalization“, „reduction of the overall travel time“. And they contained the first steps towards a Swiss high-speed railway system including new and straighter railway lines and railway carriages with pendulum suspension. In Baumann’s forecast, the future SBB would transport its passengers on long distances at a speed of 200km/h up to 250 km/h.

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[1] This EHBA-Conference paper is based on an ongoing PhD-research project at the University of Zurich, Switzerland, with the title: „Innovation Processes and Institutional Change in Public Enterprises in Switzerland: The Example of the Swiss Federal Railways (SBB), 1970-2000.“

[2] For the model of path-dependency see Paul A. David, Clio and the Economics of QWERTY, in: American Economic Review, Proceedings 75 (1985), S. 332–337

[3] National-Zeitung, Basel, Nr. 564, 8.12.1969, p. 3.

[4] SBB = Schweizerische Bundesbahnen. SBB had emerged from the nationalization of different private rail companies in 1898 after a popular vote and were turned into a stock corporation in 1999 with the Federal State owning a 100 % of all the stocks.

[5] Neue Zürcher Zeitung, Nr. 726, 14.12.1969, p. 33f.

High speed was only the most spectacular of a whole package of ideas SBB executives were developing since 1967 for regaining their competitive capacity against private cars, trucks and airplanes. Another way of enhancing travel speed consisted in reducing the overall travel time by optimizing the timetables: With a cyclic timetable in a 1-hour-interval, more frequent connections and shorter delays for changing to the connecting trains could be offered. Both projects – the production oriented high-speed innovation on the one side and the service oriented timetable innovation on the other side – had been realized or were being studied in the late 1960s abroad as well. Technical and managerial innovations at the Swiss Federal Railways and in other railway companies can best be conceived as measures to enhance their intermodal competitiveness in the transport sector in the late 1960s and throughout the 1970s. In accordance to the current international railway discourse, Baumann used the term „cybernetics“ in order to designate the necessary production and operation techniques for innovation: “Cybernetics opens new possibilities which will fundamentally find no limits until the realization of a fully automated railway net.“[6]

Given similar problems, European (and to some extent international) railway companies intensified their collaboration in the 1960s. Some proofs of this common will to cope with current and future challenges are the project for a common automate coupling system and the international conferences on „Railways and Cybernetics“ (1963, 1967, 1970) and on high-speed rail traffic (1968) organized by the International Railway Federation (U.I.C). France, Spain, Germany, Sweden and Great Britain funded research and development of national railway high-speed innovation heavily in the 1970s following the successful example of Japans New Tokaïdo-Line (Shinkansen), put into service in 1964. Their respective high-speed trains went into service between 1981 and the 1990s, with the exception of Great Britain, were the Advanced Passenger Train (APT) failed. Until now, conventional technological solutions triumphed over non-conventional propulsion techniques such as the maglev train. By the time the high-speed systems were being built, the spirit of international cooperation from the 1960s' conferences had given way to a spirit of national competition.[7]

In the late 1960s and early 1970s, also the management of the Swiss Federal Railways promoted the constructing of new and straighter railway lines allowing high-speed rail traffic,

[6] Oskar Baumann, Die SBB auf dem Weg ins Jahr 2000, in: Verkehrshaus der Schweiz, Heft 18, Veröffentlichungen 1970, p. 8.
[7] See for example Stephan Zeilinger, Wettfahrt auf der Schiene: Die Entwicklung von Hochgeschwindigkeitszügen im europäischen Vergleich, Frankfurt a.M. 2003.

as Oskar Baumann had exposed in Lucerne. The Swiss project was called „New Main Railway Traverses“ (NHT).[8] It was designed in accordance to the European infrastructure guidelines of 1974 concerning the future of the railways.[9] But the SBB buried their high-speed vision in the early 1980s. Instead, the slogan “electronics instead of concrete!“ became the leitmotif for a modified strategy. In an early phase, this strategy focused on more „software“-oriented innovations like the cyclic timetable. From the early 1990s until today, innovations in digital telecommunication, electronics and computer-assisted train monitoring became more and more important, as the aim of an enhanced overall velocity should be attained with the aid of sophisticated train control and safety systems allowing a remarkable increase of the train passage frequency on one and the same line.

The lost transportation monopoly: SBB try to catch up by increasing their tariffs

A reduction of the overall travel time in terms of a more passenger friendly offer could be reached on different ways: by minimizing the timetable intervals on the one hand and by accelerating the train velocity on the other hand. Compared to foreign railways, the Swiss Federal Railways and their private precursors electrified the complete railway net very early (between 1894 and the 1940s) allowing higher velocities on even lines. But out of topographic reasons and due to the fact that the railway lines had not been built in the second half of the 19th century following an overall plan, but by private investors who competed against each others, long and even railway lines are rare in this small, alpine country. The many curves and tunnels forced Swiss railways and Swiss rail industry to focus on electrification, enhanced stability of the contact wires, powerful locomotives and the straightening of curves in order to incrementally accelerate the train velocity. But by the end of the 1960s, these measurements were not sufficient any more: The railways began to loose shares of passenger transportation[10] in the intermodal transport competition annually after 1964. The construction of national highways for the car and truck traffic, accepted by Swiss voters in 1958 and then swiftly put into practice, accelerated this trend. The railways had for long time been the fastest and most secure means of transport for humans as well as for goods. Now they lost their transport monopoly and found themselves exposed to a dramatically growing intercompetition with car and air traffic. Considering the high fixed

[8] NHT = Neue Haupttransversalen

[9] In the 1960s, the International Railway Federation (U.I.C) designed the „railways of the future“ which should be characterized foremost by higher velocities. From 1970-73, the idea of high-speed railway traffic was further developed first in U.I.C. and then concretized in the European infrastructure guidelines. NHT was supposed to be the Swiss contribution to this new European high-speed railway net, see SBB Annual Reports 1969-1973.

[10] SBB-Bibliothek, Unternehmerische Massnahmen und verkehrspolitische Vorschläge zur Sanierung der SBB. (“Bericht 1976”), 15.10.1976, Beilage 1.

costs and given the legal obligations for SBB[11] to maintain unprofitable regional commuting lines in scarcely populated areas or cheapened tickets for certain categories of passengers,[12] it is not astonishing that the loss of important shares in the profitable long distance passenger traffic and in certain goods traffic led to heavy losses in the account: In 1966, five years after their best business result ever, SBB faced their first deficit, which could then still be coped with capital reserve. But by 1971, the internal reserves were consumed: The deficit now amounted to 54 Mio. Swiss Francs.[13] The economic recession and the following crisis from 1973/74 aggravated the bad financial situation of SBB, but it had not been the trigger for it.

In 1964, SBB had begun to adapt their ticket prices in a two-year-interval according to the general price development. The heated business cycle of the late 1960s led to an accelerated increase of prices, and train tariffs lost pace compared to the fast rising general consumer prices. Being a public enterprise, SBB were not allowed to counteract the federal policy of economic slowdown by raising their tariffs in the due way. When SBB tried to do so in 1973, the federal authorities forced them to postpone the measure until February 1974, in accordance with the economic slowdown policy. Now the price increase unfolded its effects together with the economic crisis and led to a cutback in the ticket sales revenues. Not surprisingly, SBB management put the blame for a part of their dramatically growing deficit on the federal authorities' policy.[14] The railway company concluded from this experience that its tariff policy should in the future aim at securing its market efficiency. This goal should be attained with the help of standard tariff at a "moderate" market price constituting the backbone of the company's price policy. The so called "social" tariff should only be applied under the condition that it was demanded and subsidized by the community, e.g. the state. Other than that, price reduction should only be used to stimulate the demand and for propaganda reasons.[15]

The introduction of the term "marketing" can be traced back until 1967 when SBB started advanced training for their sales managers with the help of a German sales management

[11] Federal law on the Swiss Federal Railways, 23.6.1944, Art. 3.1.
[12] 49% of all passengers were commuters who traveled with the so called cheapened„laborer rail card" or „student rail card" („social tariffs"). They only contributed 11% of SBB's revenues from passenger traffic. This „social tariffs" caused SBB a deficit amounting to 81 Mio SFR in 1968. In former years, this deficit could be compensated with the profitable transport of passengers who bought the market price tickets. In 1968, this was no longer possible. See: Botschaft des Bundesrates an die Bundesversammlung zu einem Bundesbeschluss über die Abgeltung der gemeinwirtschaftlichen Leistungen der SBB, in: BBI 1970, II, p. 76–80.
[13] SBB-Archiv, SBB40_009-01, Anpassung der Bahntarife an die wachsenden Kosten, Schreiben ans EVED vom 8.9.1972; Geschäftsbericht SBB 1976, p. 16.
[14] Geschäftsbericht SBB 1974, p. VI und S. 4. The deficit now added up to 234 Mio. SFR.
[15] Geschäftsbericht SBB 1974, p. 23.

institute.[16] Until the early 1970s, the main marketing instruments of SBB consisted in billboard advertising and in an incipient differentiation in the tariff policy: In 1968, an annual half-price rail card – which permitted the purchase of half price tickets on the whole net - for old age pensioners was introduced and followed by a monthly half-price rail card for youngsters in 1972. Regardless their price increases and marketing measures, the sales income of the SBB decreased heavily during the economic crisis: In 1977, their annual deficit added up to 770 Mio. Swiss Francs.[17] SBB executives perceived a reasonable division of labor between the different means of transportation as one fundamental prerequisite for coping with the future traffic challenges. But this entailed an overall transport policy which was to be conceived, debated, adopted and then put into vigor by the political and administrative actors as well as by the interest groups taking part in the policy making process on the different levels of the Swiss federalist system.[18]

The enterprise had faced a growing complexity and insecurity caused by technical evolution and by the change of customers' demands in the early 1970s. SBB strategists now utilized multiple factors integrating models of analysis and planning to generate orientation: Thanks to cybernetic feedback control system ideas,[19] the railway engineers and SBB managers realized the necessity of integrating the short and mid term planning for the individual company areas into a strategic and long term overall company planning.[20] A corporate board was created in 1975 assigned with the elaboration of strategic and supply studies. Managerial innovation became an instrument to cope with growing complexity and insecurity in the consequence of the economic crisis of the mid 1970s. Marketing was supposed to intensify the market and costumer orientation of the enterprise and to strengthen its economic position. The board of general directors of SBB had the company's marketing efforts evaluated by experts from "Air France" (who then advised the French National Railways SNCF on marketing) and "Swissair".[21] The results of this evaluation study showed a lack of systematic supply planning at SBB. Although product policy was an explicit aim of their business policy, SBB had focused almost exclusively on distribution and price policy in the 1970s.[22] SBB executives

[16] SBB-Archiv, SBB40_012-03, Die Zielsetzungen der SBB am Markt, Verkaufsförderungskurs (Mai 1968).
[17] Botschaft des Bundesrates zum Voranschlag der SBB für das Jahr 1977, in: BBI 1976, III, p. 1053ff.
[18] SBB-Archiv, SBB27_042, Unternehmungspolitik, Vorlage der Generaldirektion an den Verwaltungsrat vom 14.4.1972.
[19] „The railways conceive cybernetics – the science of the feedback control of such systems – as an effective instrument for corporate and operation management", see: Annual Report SBB 1967, p.VI.
[20] Annual Report SBB 1971, p. 11f.; SBB-Archiv, SBB27_042, Unternehmungspolitik, Vorlage der Generaldirektion an den Verwaltungsrat vom 14.4.1972.
[21] SBB-Bibliothek, VR-Protokolle 1979, Protokoll der VR-Sitzung vom 5.7.1979, Trakt. 6: Marketing bei den SBB: Diskussion des Zwischenberichts.
[22] SBB-Archiv, SBB40_010-05, Marketing bei den SBB, 19.6.1979, p. 9.

now charged a Basle professor for business economics and a private trust and finance company with the elaboration of the appropriate measures. In their final report in 1979, the experts suggested the creation of a specialized board of marketing with close linkage to the board of general directors.[23] The newly appointed marketing director who came from outside the company and disposed of marketing and leadership experience in the petrol business and in the Swiss army, was well aware of the problem of launching a marketing offensive while new products and new innovative services still lacked. He and his board tried their best in implementing new advertising and market research methods for the Swiss Federal Railways and put pressure on the introduction of new supply concepts.

The Swiss Federal Railways' supply conceptions in the 1970s

For the recapitalization and restructuring of their company, SBB strategists in 1976 und 1977 conceived two important reports containing a relentless analysis of the company's actual state and different scenarios ranging from a radical to a moderate cutback of services.[24] The radical cutback-scenario aimed at a train service reduced to the profitable company areas. But in the second half of the 1970s, such a scenario could impossibly meet the approval of the federal parliament and of the individual cantons who are endowed with important participatory and deciding rights in Switzerland. Nevertheless, a bold expansion-scenario was equally jeopardized by the heavy investments needed for it. It entailed a politically as well as technically favorable context hardly given in the 1970s. As has been outlined above, the Swiss Federal Railways had nourished expansion plans in the early 1970s, which entailed heavy infrastructural investments. Yet for a long time, the money as well as the unanimity necessary for the realization of these plans was missing. In the highly complex federalist Swiss system, the structural disadvantage of the track-bound railway system when it comes to construct new lines weighed heavily. Babette Nieder shows in her comparative study about the development of the high-speed trains TGV in France and ICE in Germany that in a federalist system, the search for democratic and regional consent is vital in order to generate legitimacy for public infrastructure building projects.[25] This fact points towards the importance of the structural and political framework the Swiss Federal Railways had to deal with when planning infrastructure oriented product innovation. For SBB's corporate policy

[23] Ibid. p. 24.

[24] SBB-Bibliothek, Unternehmerische Massnahmen und verkehrspolitische Vorschläge zur Sanierung der SBB, 15.10.1976 ("Report 1976"); Bericht 1977: Mögliche Angebotskonzeptionen der SBB und flankierende Massnahmen, 14.10.1977.

[25] Babette Nieder: TGV und ICE im Spannungsfeld von Politik, Verwaltung und Industrie (1968-1991): Ein deutsch-französischer Vergleich, Herne 1997.

was closely linked to the national transport policy. This linkage had both limiting and enabling effects. SBB took great interest in a coordinated overall transport policy from which they expected a fairer adjustment between railways and road traffic. In the mean time, between 1971 and 1974, SBB planners tried to work on their project for a new high-speed line between Zurich and Berne, a plan Oskar Baumann had publicly outlined already in 1969. This new line should constitute but the first step towards a Swiss high-speed railroad network, the already mentioned "NHT", which at best went combined with one or several new alpine tunnels on the north-south-axis to Italy. But instead of meeting interest and support, SBB planners met popular resistance and the experts' doubts they were not able to refute. The plans for "NHT" envisioned the constructing of a new straight line traversing a fertile agricultural area between Berne and Zurich. Only a few years earlier, the first new motorways had hardly found any opposition. But times began to change: In 1969, the necessity to restrict the building and road construction mania had become obvious and entered the constitution in the form of a spatial planning regulation. It obliged the cantons and communities to regulate the use of the relatively scarce territory in Switzerland and to hold public hearings on land use. In that unfavorable context, SBB executives began to pick up possible alternatives to the dead-end-project "NHT". Even more so, as the project also lacked internal unanimity inside SBB.[26]

Out of the lack of money, of political legitimacy as well as of unanimity, SBB strategists began to favor a more "software"-oriented: a cyclic fixed integral timetable designed by three young SBB engineers from 1971-1972.[27] The adoption of a cyclic fixed timetable had since long been an option at SBB: Already in 1953, SBB engineers had visited the Dutch Railways („Neederlandse Spoorwegen") to study their cyclic timetable. In 1967, the issue was raised again in an internal overview about measures to raise competitiveness. And in 1968, a cyclic timetable in a 30-minutes interval was successfully introduced on a regional commuting line in the Zurich area. The Swiss cyclic timetable concept from 1972 permitted to accelerate the traffic velocity by enhancing the frequency of train departures and connections. The constructing of new tracks or of new carriages became obsolete, at least in the first phase. The authors of the 1972 timetable concept proofed to be innovative in a triple sense: First of all they proposed a mathematically based innovation of the operating schedule. Secondly, they

[26] See for example the statements of Rodolphe Nieth, former engineer at SBB and „inventor" of the alternative „Swissmetro" idea, in: Jacques Neyrinck et al., Swissmetro: L'avion sans ailes. Lausanne 2000.
[27] Jean-Pierre Berthouzoz, Hans Meiner, Samuel Stähli: Taktfahrplan Schweiz: Ein neues Reisezugkonzept, herausgegeben anlässlich der Fachtagung der Gesellschaft der Ingenieure der SBB vom 16.6.1972 in Choindez.

committed themselves to market and costumer orientation. While many SBB executives blamed the unfair intermodal transport competition and took this as a general excuse for their bad business performance, the "madcaps' club"-engineers, as they called themselvers, blamed the insufficient, not up to date service supply SBB offered their potential customers.[28] Thirdly, once the path "cyclic timetable" was chosen, it generated subsequent connection capacity in the area of wagon constructing or infrastructure planning. In 1979, after seven years of more or less intense evaluation, SBB directors decided to realize the "New Passenger Traveling Concept", name of the timetable-project. It had been years of heated public and internal debate on the SBB high-speed project "NHT". Unlike NHT, the timetable-project's spatial effects were minimal and it was comparably inexpensive. The intensified and more systematic occupation with marketing and corporate restructuring at SBB in the late 1970s may also have favored the realization of this supply-sided service innovation.[29]

The so called service mandate of 1980 between SBB and the federal government represents the common effort of SBB executives and federal authorities to render the railway company more efficient and profitable while conceding more entrepreneurial scope to SBB. [30] This also included a more flexible tariff policy. But the increase of the ticket prices planned for 1980 met internal criticism: At the occasion of a marketing meeting in 1979, the head of the SBB administrative board demanded that the company should evaluate an overall price reduction by 10% hinting at the current low price experiment of the Swedish railway company.[31] Although the company executives dismissed such an experiment for Switzerland in their report on "alternative tariff" studies and although they managed to put through a more moderate and differentiated price increase, these discussions give proof of the different attitudes SBB representatives adopted towards the current challenges by the end of the 1970s: Some of the directors focused on the negative account and from there deduced the necessity for a marketing offensive as well as for higher tariffs in order to increase the gains in a short term perspective. Others favored measures which included overall transport policy issues: They demanded price reductions in order to enhance the railway's share in the modal split and to increase the gains in a long term perspective. A third party of the administrative board

[28] Berthouzoz u.a., Taktfahrplan, p. 1.
[29] SBB-Archiv, SBB53_001-04, Neues Reisezugkonzept/Taktfahrplan, 1978–1979.
[30] Botschaft zum Leistungsauftrag 1980 an die SBB, in: BBI 1980, I, S. 306–354.
[31] SBB-Bibliothek, VR-Protokolle 1979, Protokoll der VR-Sitzung vom 5.7.1979, Trakt. 6: Marketing bei den SBB, Zwischenbericht; SBB40_008-5, Erfahrungsbericht der Niedrigpreispolitik der Schwedischen Staatsbahnen, 21.11.1980.

wanted the price increases to correspond with an increase of the service supply.[32] The approval of the supply sided "New Passenger Traveling Concept" and the cyclic timetable in the same year happened in accordance to that third view shared by the majority. The philosophy of competitiveness fundamental in the cyclic timetable project also entered the already mentioned service mandate of 1980 which stated: „Railway traffic has only the chance to compete with the agile, freely disposable car when it offers regularly, frequently and fast driving, comfortable trains."[33]

From the "New Passenger Traveling Concept" of 1982 to "Railway 2000" in 2005

The "New Passenger Traveling Concept" got introduced on May 23rd 1982 with the slogan: „One train every hour!" The new concept entailed a 21% increase of passenger train supply.[34] The cyclic timetable and its components – for example the traffic node system[35] - became the core and the point of reference for almost the entire innovation activities in the area of passenger transport. It influenced the ordering of new wagons[36] and led to a re-conceptualization of the old "NHT" high-speed project. Instead of enhancing railway traffic only on two major lines (from east to west and from north to south) and only for the far distance traffic, the pioneer of the timetable-project of 1972, engineer Samuel Stähli, in 1984 designed a new concept which would increase the offer on the whole net and also on regional commuting lines. Stähli had not only conceived the cyclic timetable together with other young SBB engineers, but he had also been part of the team which constructed the commuting train service in Zurich ("S-Bahn Zürich"), based on the 30 minutes timetable interval in the early 1980s. In 1985, SBB executives informed the public about their new concept. It bore the name "Railway 2000" and it entailed faster and more frequent train connections by reducing the timetable intervals from 1 hour to 30 minutes (similar to the commuting lines) as well as by evening some lines and building some new ones. The innovation consisted in the upside turning of the production process: First of all, customers' wishes and needs were analyzed with marketing instruments. Apart from comfort innovation, customers mainly wished fast, secure and well connected train transport carrying them smoothly from their small town into

[32] SBB-Bibliothek, VR-Protokolle 1979, Sitzungen vom 5.7.1979 und vom 25.10.1979, Trakt. 3: Alternative Tarifstudien, p. 425-438.
[33] Bundesrats-Botschaft zum Leistungsauftrag 1980, p. 320.
[34] Geschäftsbericht SBB 1982, p. VII.
[35] The one-hour interval works on the basis of two nodal points (railway stations) lying in 60 minutes traveling distance. Like this, trains will meet in the middle after 30 minutes. With this system, train arrive shortly before the next full hour so a quick connection to the next nodal point is guaranteed.
[36] Due to „Railway 2000" the pendulum suspension technique, which had been studied by SBB well into the 1970s but then given up, met new interest and was finally introduced.

the bigger city to another small town. Out of that, the ideal timetable was constructed. It contained intervals of 30 and 60 minutes from one traffic node (railway station) to the next one. The timetable constructors ordered the products according to this timetable: to build or to even railway lines, to develop faster locomotives and/or carriages and eventually also to purchase train control systems facilitating to reach Berne in less than one hour from Zurich which reduces the current travel time by a quarter of an hour.

Of course, "Railway 2000" was going to cost the federal state a lot of money. But this time, the context for such demands was much more favorable: Since 1984, an intense public and parliamentary debate took place over the environmental damages car traffic and subsequent air pollution did to the forests. The "dying-forest" phenomena asked for a new environmental policy clearly committed to the public transport: All of a sudden, the idea of massively subsidizing the annual half-price rail card became an important environmental political measure and was approved by the parliament.[37] Thanks to the federal subsidies, SBB were able to launch their half-price rail card for a hundred Francs only – it had been costing the triple ten years earlier – on January 1st 1987. Now SBB executives and engineers profited from their enlarged scope of influence to emphasize the necessity of an infrastructural expansion in order to enhance the long term attractiveness of railway traffic: In 1985, they launched the supply and product expansion project "Railway 2000" as a clever recombination of the "New Passenger Traveling Concept", of components of the commuting system successfully in vigor in the greater Zurich area and last but not least of the rests of the high speed-project "NHT".[38] "Railway 2000" was approved by popular vote on December 6th 1987.

Challenging electronic innovations

On December 12th 2004, a new train timetable will enter in vigor with effects on the bus and tram timetables in all cities and communities which allows fast and regular connections on a 1 hour, 30 minutes or even 15 minutes interval. This new timetable is built upon the cyclic fixed integral timetable introduced in 1982, enlarged in 1987, partly reduced in 1993 and enlarged again in 2001. "Railway 2000" 1st phase entails - next to modern carriages, part of them with pendulum suspension, part of them with double deck - one newly built major railway line

[37] SBB-Archiv, SBB40_008-06, Tarifmassnahmen im Zusammenhang mit dem Umweltschutz, 26.3.1985.
[38] SBB-Bibliothek, NHT, 2. Bericht über den Stand der Arbeiten, Vorlage der GD an den VR vom 5.6.1984; and: Gespräch mit SBB-Generaldirektor Hans Eisenring zum Projekt Bahn 2000, in: Schweizerische Eisenbahn-Revue 2/1985, p. 44 - 47.

between Mattstetten and Rothrist. The good old "NHT" high-speed spirit has survived on this restricted railway line where trains are supposed to drive at a speed of 200km/h. Unfortunately, this will not yet be possible on December 12th. The restricted high-speed concept is dependent on a high security train control system, as the trains will be following each other in a 2-minutes interval in peak time. In 2002, SBB proudly announced that they were operating on the first worldwide proving ground with the "European Traffic Management" (ERTMS) including the "European Train Control System" (ETCS) Level 2 with its mobile communication technique GSM-R (Global System for Mobile Communication Railways). In the mean time, several other railway companies have begun to test ETCS Level 1 or Level 2. Although intracompetition is at work in this R&D railway project again, the aim consists in developing a common European interoperable train control system which enhances transnational rail traffic security and reduces the production and purchasing costs for each railway company. But the man-machine-interface of ETCS Level 2 has proofed to be more complex and challenging than the SBB engineers had assumed: The testing has not yet rendered sufficiently good results. As a consequence, "Railway 2000" will start with ETCS Level 1, which is reinforced with the old visual signalling on the new line between Zurich and Berne. It signifies that the trains cannot pass at 200km/h, but only at 160km/h what will force passengers to run to get to their next train connection in Zurich as soon as the train has the slightest delay. Other decisive missing components of the system for a modern and fast overall railway service of the 21st century are the New Railway Alpine Traverses (NEAT) with their giant tunnels at St. Gotthard and Lötschberg still being under construction and provoking heated debates and critical investigation because of their ever increasing costs.

Economic crisis, deregulation and another way of reforming the railways

These projects and issues kept the Swiss Federal Railways busy for the past thirty years. In the last 15 years and in consequence of the crisis and stagnation of the 1990s, SBB have met growing external and internal pressure to reform their management structures and to prepare themselves for intramodal competition: to compete with other railway companies on the same tracks in Switzerland or abroad in accordance to the European transport liberalization and railway reform agenda from 1996 (railway reform, phase 1). Already in 1991, the general directors launched a new mission statement saying: „The Swiss Federal Railways are being guided by the market: A 'market-oriented culture' reigns in the management and in the company."[39] From 1993 to 1999, the SBB have reduced their personnel by 10'000 employees

[39] SBB-Archiv, SBB39_007-13, Leitbild SBB: Erläuterungen, 30.9.1991.

and they have subjected the company and their staff to a troubling series of thorough restructuring between 1993 and 1999. But Switzerland is not Great Britain: Although formally a stock corporation since 1999, SBB Inc. is still 100% owned by the state and has resisted the scattered claims for vertical disintegration. Until now. For railway reform, phase 2, is on the current agenda of the federal parliament.

Resumé

Up to this stage of my explorative PhD-research study, the following questions have been raised, some of which I would like to explore in my conference presentation:

- Did technological and managerial innovation solve the problems of transport *intercompetition* the Swiss Federal Railways faced from the late 1960s onwards?
- In which aspects and for what reasons did SBB develop different solutions to the competition problem - identified as a speed, automation and rationalization problem - than other Western European railways and how do they manage to cooperate in the trans-Euroepan high-speed railway net?
- How did the institutional and organizational setting in the political, social and economic context of the early 1970s foster selected kind of technological and workflow innovation (keyword: path-dependency)?
- What were the technical and the organizational foundations of the supply sided „New Passenger Railway Concept“? And how did this concept change workflows and the relationship towards the railway passengers and other stakeholders?
- Which sorts of technical trajectories and learning processes can be identified in the course of the „Railway 2000“-project?
- In which way does institutional change influence the shaping of technico-organizational innovations in this public service enterprise and vice versa?
- How do SBB meet railway *intracompetition* fostered by transport liberalization, the economic crisis of the 1990s and the railway reform in Europe?

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