

**Zeitschrift:** Annual report / Swiss federal railways  
**Herausgeber:** Swiss federal railways  
**Band:** - (2003)  
  
**Rubrik:** Infrastructure

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The new Rail 2000 route between Langenthal and Herzogenbuchsee



**Mattstetten-Rothrist.** These 45 kilometres of brand new track are the heart of Rail 2000. 14,599 m of tunnels, 20 bridges, 3 underpasses for wildlife. No points, no intermediate stations – a clear run. By the 2006 timetable, journey times between Bern and Zurich will have come down to 57 minutes.



In the Langenthal area alone, 65 wells have been dug to gauge drinking water quality. At the construction site, work is only ever in progress along 100 m at a time.

Rail benefits the economy. With gross investments of CHF 1.6 billion, SBB Infrastructure Construction has been awarded the contract for the construction of the new rail line. The company awarded so much work to contractors. And helped to keep the Swiss economy on track.

Older places. SBB is ensuring that people and the environment get the peace and quiet they deserve. The new Rail 2000 enters densely populated areas a wide berth. Working for greater comfort for passengers and better quality of life.

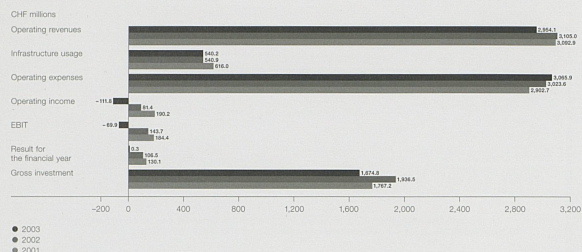
12 December 2004. The inauguration of Phase 1 of Rail 2000 will usher in a new era in rail transport. The higher speeds mean that passengers will reach their destinations faster. State-of-the-art safety technology means that trains can run more frequently. And ultra-modern rolling stock means more comfort and more capacity.

Cooperative landowners. Over 150 new structures – some of them huge – have been built on a total of 253 hectares. The construction of the new rail line has been a huge task. In 35 municipalities have played their part in helping the railways move into the future.

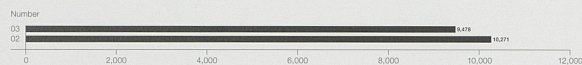




#### Infrastructure in brief<sup>1</sup>.

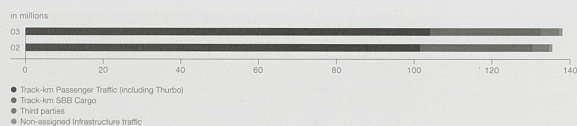


#### Employees<sup>2</sup>.



<sup>1</sup> By segment; Group income and expenses not eliminated.  
<sup>2</sup> Average workforce in full-time equivalents, including subsidiaries.

#### Changes in track-kilometres.



**Strategic objectives, Infrastructure.** Safeguarding high-quality operations and service reliability as network capacity utilisation increases. High standards of punctuality, safety, availability and productivity as financial resources become increasingly scarce. Prioritising capital expenditure in terms of maximum customer benefit.

More than 7,300 km of track, 842 stations, 14,202 sets of points, 28,408 signals, 710 signal boxes, 304 tunnels and 5,982 bridges. Despite running on the most heavily used infrastructure in Europe, 19 out of 20 trains in Switzerland arrive at their destinations on time.

#### Countdown to Rail 2000.

In 2003, the Infrastructure division achieved a balanced budget despite a number of negative extraordinary factors. Operations are now directed towards the implementation of phase one of Rail 2000 on 12 December 2004. A number of important tasks relating to this landmark event were completed in the year under review.

The Infrastructure division posted a surplus of CHF 0.3 million in 2003 following a CHF 141 million transfer in connection with the spinoff of real estate activities into an independent division (see page 8). A direct comparison with the previous year is possible only to a limited extent due to the establishment of Real Estate as a separate division.

The infrastructure business was shaped by a variety of factors in the reporting year. Traffic revenues were down by CHF 25 million due to reduced demand. Extraordinary factors on both the expenditure and earnings sides had a negative impact of CHF 32 million. Specifically, these factors included possible tax charges in connection with the Federal Court decision regarding taxation of "non-operating" SBB real estate holdings (CHF 41 million – for details, see page 7) and the across-the-board budget cut by the Confederation (CHF 13 million). These setbacks were compensated by positive operating factors, notably the improvement in the field of power generation (+ CHF 35.5 million).

Investments benefiting the economy. With gross investments of CHF 1.675 billion, the SBB Infrastructure division contributed significantly to the domestic economy in the reporting year. Roughly a third of all investment (Rail 2000, noise abatement) was met from dedicated resources from the Public Transport Financing Fund (FinöV). Federal funding of the Infrastructure division rose on balance by CHF 44 million to CHF 1.383 billion. Federal contributions to facilities maintenance increased by CHF 49 million and those for basic requirements by CHF 24 million, while those for the operation of the facilities went down by CHF 29 million. Comparisons with year-back figures are complicated by the restitution to SBB of the assets and liabilities of the Lake Constance line previously leased to Mittelthurgaubahn.



### A good year for the three networks.

**More train-path kilometres:** Trains covered a total of 138 million km on SBB's standard gauge network in 2003. This corresponds to an increase of 1.8% over the previous year. Owing to the integration of the Lake Constance Line, operated by Mittelthurgaubahn until December of 2002, passenger train kilometres covered by SBB and its subsidiary Turbo increased by 2.5%. Passenger train kilometres of other railway undertakings remained unchanged. The train-path kilometres covered by SBB Cargo were down 1.9% year-on-year, while the total for the other railway undertakings increased by 54% (from a much lower level) to 1.9 million km.

### Stable power grid and telecommunications network:

The SBB power grid was stable over the reporting year. The new "Les Tuileries" transformer substation improved power supply in the Geneva region. Total energy consumed by trains on the SBB network was 2080 GWh, 0.5% more than in the previous year. Despite the hot summer and the increasing number of air-conditioned coaches, the rise in energy consumption was kept below the growth in train-path kilometres.

**The SBB telecommunications network** posted an availability figure of 99.97% for the reporting year. SBB will invest roughly CHF 100 million over the next years to equip railway tunnels with a radio communications system. This project is being implemented in cooperation with the three Swiss mobile telephony service providers and will thus extend the reception area for mobile telecommunications on routes with tunnels.

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### Good time-keeping despite breakdowns.

In the reporting year, 19 out of 20 passenger trains arrived within five minutes of schedule, thus maintaining the very high level of time-keeping. The quality of operations deteriorated significantly in the autumn, when a series of break-downs occurred, especially in the greater Zurich area. A task force deployed in November is implementing a package of measures and is monitoring developments.

Punctuality of freight services in the reporting year was 90.7%. In the traditionally more punctual domestic sector, 94.1% of trains arrived on time, i.e. with a maximum deviation of 30 minutes (previous year: 93.4%). In transit goods, just under 70% of trains were on time. Processing of international freight was hindered by the complete closure of the Monte Olimpino II tunnel south of Chiasso, which remained closed from autumn 2002 until 5 May 2003 due to refurbishment work following serious water penetration. This placed great strains on the operations specialists from the "Centro d'esercizio regionale", the operations centre in Bellinzona, which has been monitoring – and for the most part also controlling – rail traffic in Ticino since 1 April.



### Clockface service for freight trains.

The timetable change in December went smoothly. This time it was not the passenger timetable but the freight timetable that underwent major changes. The new "two-wave" system for local delivery of freight wagons called for significant adjustments to freight train marshalling at the major terminals. Track layouts and safety installations in the Biel/Bienne and Lausanne marshalling yards will be extended and updated for this purpose over the coming years.

Since the timetable change in December, freight trains have now also been operating on a clockface schedule. Thanks to internal optimisation and systematisation, timetablers were able to increase the number of available freight paths along the north-south corridor by 20 units per day.

### Differing rates of progress in strategic projects.

The strategic objective of the Infrastructure division is to increase the capacity of the network in keeping with the company's growth targets for passenger and freight traffic. Moreover, third parties are to be given the opportunity to operate their own trains on the SBB network under the same conditions. The extension of rail capacity is based on several key projects, the current status of which is as follows:

- Important advances were made in phase 1 of the Rail 2000 project. In close coordination with the requirements of the traffic divisions, the company had invested CHF 5.9 billion in rail network upgrades by the end of 2004. In the reporting year 2003, CHF 559 million (as against CHF 729 million in the previous year) went into construction work for Rail 2000.

In 2003, the 9.4 km long double-track tunnel between Zurich and Thalwil – the second-largest construction project of the first phase of Rail 2000 – went into operation. Costs were CHF 890 million, including an initial investment of CHF 90 million for the projected tunnel towards Zug as part of the future AlpTransit access route. In the approaches to Zurich Hauptbahnhof, upgrading of the lines from Altstetten, Wiedikon and Wipkingen was completed in mid 2003, enabling more trains to enter and leave the main station at the same time.

Structural work on the last two tunnels has been completed on the new 45-km Rail 2000 route between Mattstetten and Rothrist. Installation of the rail equipment is proceeding quickly in parallel. In 2003, 285 trains transported over 200,000 tons of ballast, 85,000 sleepers and over 100 km of rail to the longest construction site in Switzerland. Work on the upgraded line to Solothurn and on the "Kriegsschlaufe" ("wartime chord") connecting Rothrist and Zofingen are also close to completion. The third track between Geneva and Coppet was nearly finished at the end of the year, in time for entry into service in February 2004. Also on schedule is the construction of three passing loops with a total length of ten kilometres between Worb and Emmenmatt.

In addition to the major construction projects mentioned above, many smaller construction projects are in progress right across the SBB network as a part of Rail 2000. These include, for example, the modifications to the Biel/Bienne-Delémont-Basel route for the use of tilting trains. All of these projects are prerequisites for the major service upgrade in December 2004.

- Construction of the GSM-R (Global System Mobile for Railways) radio network commenced in the reporting year. This system replaces the obsolete train, marshalling and engineering-work radio systems and facilitates data transfer between the signal boxes and trains. On the new route, the manufacturer has verified operability of the system for trains running at 200 km/h.
- GSM-R is required for the implementation of ETCS, the European Train Control System. With GSM-R, the signal data are transmitted by radio directly to the driver's cab instead of by line-side signals. Only with the combined ETCS/GSM-R system will it be possible to maintain speeds of 200 km/h on the new route with 2-minute headways between trains. Based on the initial results of ETCS pilot operation between Zofingen and Sempach-Neuenkirch, SBB decided in December 2002 to also equip the new route with conventional signals as a fallback, and thus to accept a reduction of the maximum speed down to 160 km/h. Although pilot operation during 2003 showed that performance was no longer inferior to that on routes equipped with conventional signalling, SBB has adhered to its decision not to rely on ETCS for the launch of Rail 2000 in December 2004. It does, however, expect ETCS to



have attained the requisite degree of maturity for commercial operation on the new route by 2006.

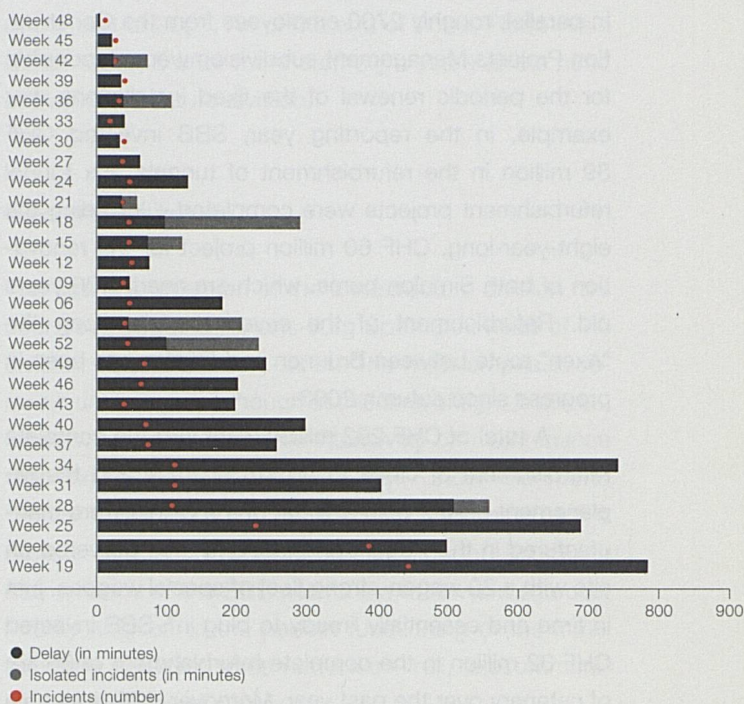
- Automation of the network continues under the ATR (Automatisation Télécommande Réseau) project. In 2003, SBB equipped 28 stations with systems for 100% remote control of points and signals from a re-mote control centre. With the changeover, the personnel previously responsible for operations on site have either transferred to the corresponding remote control centre or taken on purely commercial functions. The largest ongoing project is the automation of the route from Gümligen to Malters by 2005. Investment in remote control of the 28 train stations totals roughly CHF 170 million.
- As the fifth strategic project, all train operations will in future be coordinated from a central operations office in Olten and four regional operations centres. Thanks to short communications channels, the Rail Control Centre (RCC) means that the increasingly dense traffic on the SBB network can be handled even more efficiently. A considerable amount of work still has to be done in the areas of fault management and personnel training before the system finally goes live. Automation of the network is the basic prerequisite for implementation of the RCC.

#### CHF 946 million spent on network maintenance and renewal.

In 2003, SBB invested CHF 946 million (i.e. excluding FinöV grants) in maintenance and renewal of the rail network. The cantons and communities contributed an additional CHF 146 million, primarily for additional stations and platform underpasses.

#### A good end-result.

Events per week on ETCS pilot section Zofingen–Sempach–Neuenkirch 2002–3



● Delay (in minutes)  
 ● Isolated incidents (in minutes)  
 ● Incidents (number)

**Prevention and reaction:** The goal is to ensure the highest possible availability of control centre, signalling, catenary, high-voltage, information and telecommunications systems. Regular checks and periodic renewal are also required for points, trackwork, catenary, platforms and the many civil engineering structures such as bridges and tunnels.

The heatwave placed excessive strains on rail infrastructure. At SBB, a team of 1800 people ensures the availability and safety of the railway infrastructure. In addition to periodic checks on the fixed installations, a Swiss-wide standby organisation ensures rapid rectification of any defects in the event of a failure. Train services were seriously affected by two significant incidents: a cable fire in the tunnel at Zurich Airport and a total power failure at Zurich Hauptbahnhof. Moreover, the derailments at Brugg, Sursee and Zurich Oerlikon called for infrastructure repairs to be carried out within hours. Responsibility for the maintenance and operation of the infrastructure of the Lake Constance line previously operated by Mittelthurgaubahn was transferred to SBB at the start of the year.



### 90 kilometres of track completely refurbished.

In parallel, roughly 2700 employees from the Construction Projects Management subdivision were responsible for the periodic renewal of the fixed installations. For example, in the reporting year, SBB invested CHF 39 million in the refurbishment of tunnels. Six tunnel refurbishment projects were completed – including the eight-year-long, CHF 60 million project for the renovation of both Simplon bores, which are nearly 100 years old. Refurbishment of the seven tunnels along the “Axen” route between Brunnen and Flüelen has been in progress since autumn 2003.

A total of CHF 292 million went into the complete refurbishment of close to 90 km of track and the replacement of 429 points. Most of the points were manufactured in the Hägendorf plant and then delivered on site with a 20 wagon-strong fleet of special wagons, just in time and essentially “ready to plug in”. SBB invested CHF 32 million in the complete refurbishment of 60 km of catenary over the past year. Moreover, SBB was able during 2003 to reduce the number of barrier-less level crossings by 75 to a total of 561.

### Modernisation of 130 regional stations.

Over the past 18 months, SBB has refurbished 130 smaller and medium-sized stations to make them more customer-friendly. All 620 regional stations will eventually be renovated under this “station facelift” programme. To date, roughly CHF 100 million has been invested. Because of the federal government spending cuts, the completion date for this programme (originally in late 2006) will be delayed for several years. Some 40 local stations will be refurbished in the current year, slowing down to about 30 per year in future.

Among the projects nearing completion, six station refurbishments in the reporting year are the most striking:

- Romanshorn station was completely renovated for an investment of CHF 52 million. In addition to high platforms and a modern train control system, the station was equipped with a pedestrian underpass. A double track now extends for a length of 1.5 km towards Egnach, speeding up train operations.
- Brugg station was also equipped with a new safety installation, and platforms were raised to a comfortable boarding height of 55 cm above track level. Track work will be completed in April 2004, with a total budget of roughly CHF 43 million.
- An island platform with access via an underpass has made boarding easier in Emmenbrücke since April 2003.
- Thanks to the island platform completed at Cadenazzo in November 2003, passengers at this station no longer need to cross the tracks in order to reach their train. As part of the same project, the safety installation was also renewed and the track geometry improved. The investment in Cadenazzo came to approximately CHF 24 million.
- At Delémont, SBB invested roughly CHF 27 million in modernisation of the station building. This also involves rebuilding the platforms and installing a modern interlocking system.
- The modernisation of Chur station – a joint project together with the Rhätische Bahn and the city – is still in progress. In an initial phase, a new pedestrian underpass was inaugurated in late May.



### **Modern interlocking system for the Seetal and Brünig lines.**

Following the changeover to tram-type operation on the Seetal line in December 2002, a second phase of the project involves eliminating or improving the many level crossings along this line. SBB has been commissioned by the Cantons of Aargau and Lucerne to improve the safety installations and perform the construction work.

On the SBB's only narrow-gauge route, the Brünig line, all switch-operated signal boxes were replaced over the past two years with electronic systems. Following the investment of CHF 23 million, the entire line can be monitored and controlled remotely from Meiringen. The parallel installation of a train control system further improved operating safety.

In January 2003, as part of a cantonal mandate, SBB commenced construction of six stops for the Zug S-Bahn (urban transit) system.

### **Strict process structure.**

The Infrastructure division has been working with a strict process structure since 1 January 2003. The Sales and Capacity Management (VKM) subdivision is responsible for relationships with the rail network's users, translates their requirements and wishes into concrete timetables, supplies the network with power and manages the operation of some 7000 trains each day.

The Asset Management (ASM) subdivision ensures that the fixed installations are operating properly and defines the refurbishment and renovation programmes for the entire network.

The third subdivision, Construction Projects Management (PBM), acts as the SBB's own construction company, implementing projects on behalf of Asset Management. Construction Projects Management also comprises the Construction Logistics and Procurement unit.

As of 1 November, the technical areas of the Infrastructure division (Telecommunications, IT, ETCS) were subsumed into TIM (Technology and Innovation Management).

Management changes: On average in 2003, the division's headcount was 9,478, i.e. 793 below the number at the end of 2002. As of the end of 2003, Pierre-Alain Urech left SBB after more than eight years at the head of the Infrastructure division.

### **Key strategy issues.**

The strategic direction of the Infrastructure division has been reviewed under Hans-Jürg Spillmann, head of the division since 1 January 2004. The main emphasis remains unchanged, although at this time of tight finances, funds will be focused more intensively on maintenance than expansion of the rail network. Under the motto "Forza", Infrastructure management has launched a project to identify possibilities for further improving maintenance of the SBB network with fewer resources. Priority is given to the perfect functioning of the Infrastructure division's three networks – rail, telecommunications and power supply.

Investments in new facilities will be made wherever the Infrastructure division's major customers – Passenger Traffic and SBB Cargo – find market potential. The search for increased rail capacity is geared primarily to improved procedures. An example of this is the systemisation of the freight timetable. In a second step, the opportunities presented by technical advances must be consistently exploited. SBB does not favour expansion of the rail infrastructure until the capacity of specific parts of the network – generally the major urban agglomerations and transit routes where mainline, freight and suburban trains operate in parallel – has been exhausted and changes in processes or electronics cannot bring about any further improvements. Examples of this are the new Zurich cross-city line and the Geneva-Eaux-Vives-Annemasse and Mendrisio-Stabio-Arcisate routes, for which planning is already well advanced. The financing of these projects by the Confederation still remains to be clarified, however.