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Switzerland has the world's densest rail network

Switzerland's trains are becoming faster and more frequent while offering a record number of connections. The 175-year-old network shapes the way people live. Several challenging competitions shine a spotlight on this railway phenomenon.

STÉPHANE HERZOG

The Swiss tend to think they are unique. When it comes to rail travel, which celebrated its 175th anniversary in Switzerland in August, they are right. Switzerland's rail network is the densest in the world. The number of trains is increasing to meet the demands of a growing population, and they are becoming faster, enabling longer journeys. The technical quality of the Swiss rail network, its beauty, and its stunning routes through the Alps attract tourists from all over the world.

This uniqueness also results in unusual competitions, such as the Swiss Train Challenge, which aims to travel through 26 cantons in under 24 hours. This can be accomplished with a simple day pass, available from your municipality for just 44 Swiss francs. In 2015, a journalist from the RTS television network completed the feat in 19 hours and 46 minutes. His team relied on the calculations of Philippe Morf, a traffic planner from the Swiss Federal Railways (SBB). In 2016, a group of four young people from Ticino took up the challenge, completing it in 17 hours and 19 minutes. The team was able to rely on flawless connections, in a country where 91.9 percent of trains are on time, according to the SBB.

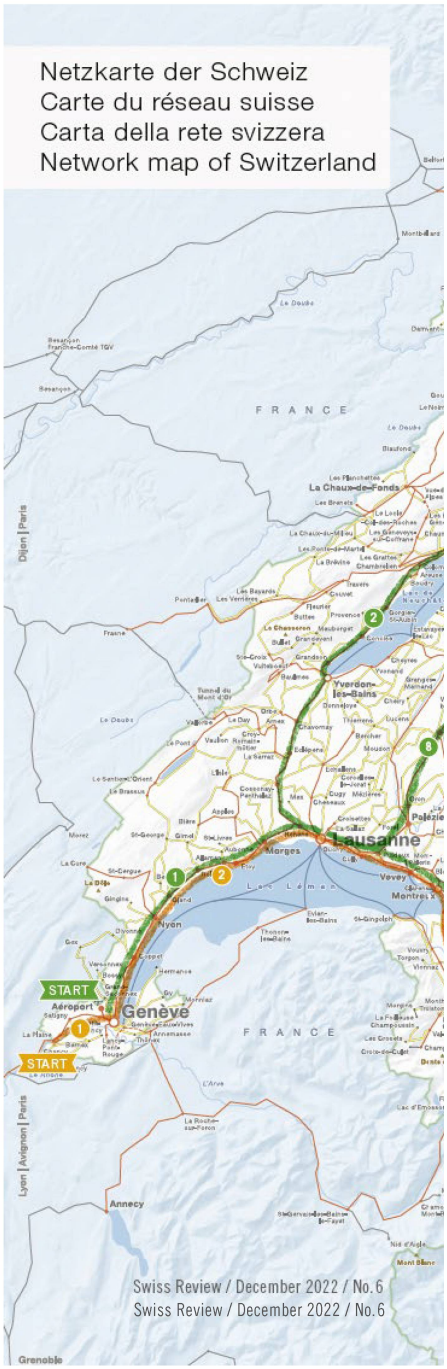
Swiss extremes

Higher, farther, faster, more beautiful? In search of somewhat unconventional Swiss records

This edition: on the densest rail network in the world.

A challenge for passionate doctoral students

In 2018, a German and a French doctoral student from EPFL threw their hats into the ring. "If we wanted to beat the record time, we knew we would have to bring out the big guns," agree Dirk Lauinger and Emmanuel Clédat. The two scientists used an algorithm paired with a geographic information system. The algorithm was run on a desktop computer and delivered its results after ten days of calculations, proposing a route that could be completed in 16 hours and 54 minutes. The actual implementation did not go to plan, however, due to a series of delays. What's more, the route included a 3.7 km ride on a PubliBike from Schaffhausen to Thurgau that became impossible since the rental bikes were out of order! The former EPFL researchers explain that they embarked on this adventure due to their passion for trains in general and the Swiss railway in particular. "It's a political statement in favour of a reliable and decentralised rail network,"

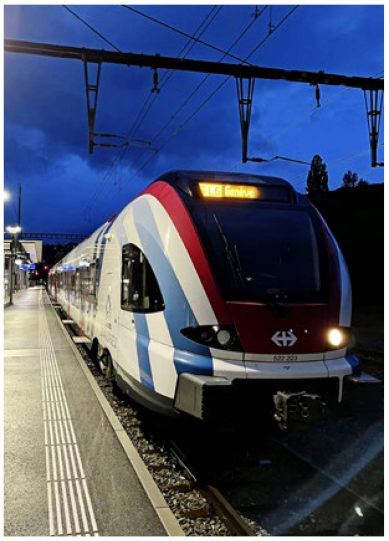


The longest journey from west to east: La Plaine to Scuol

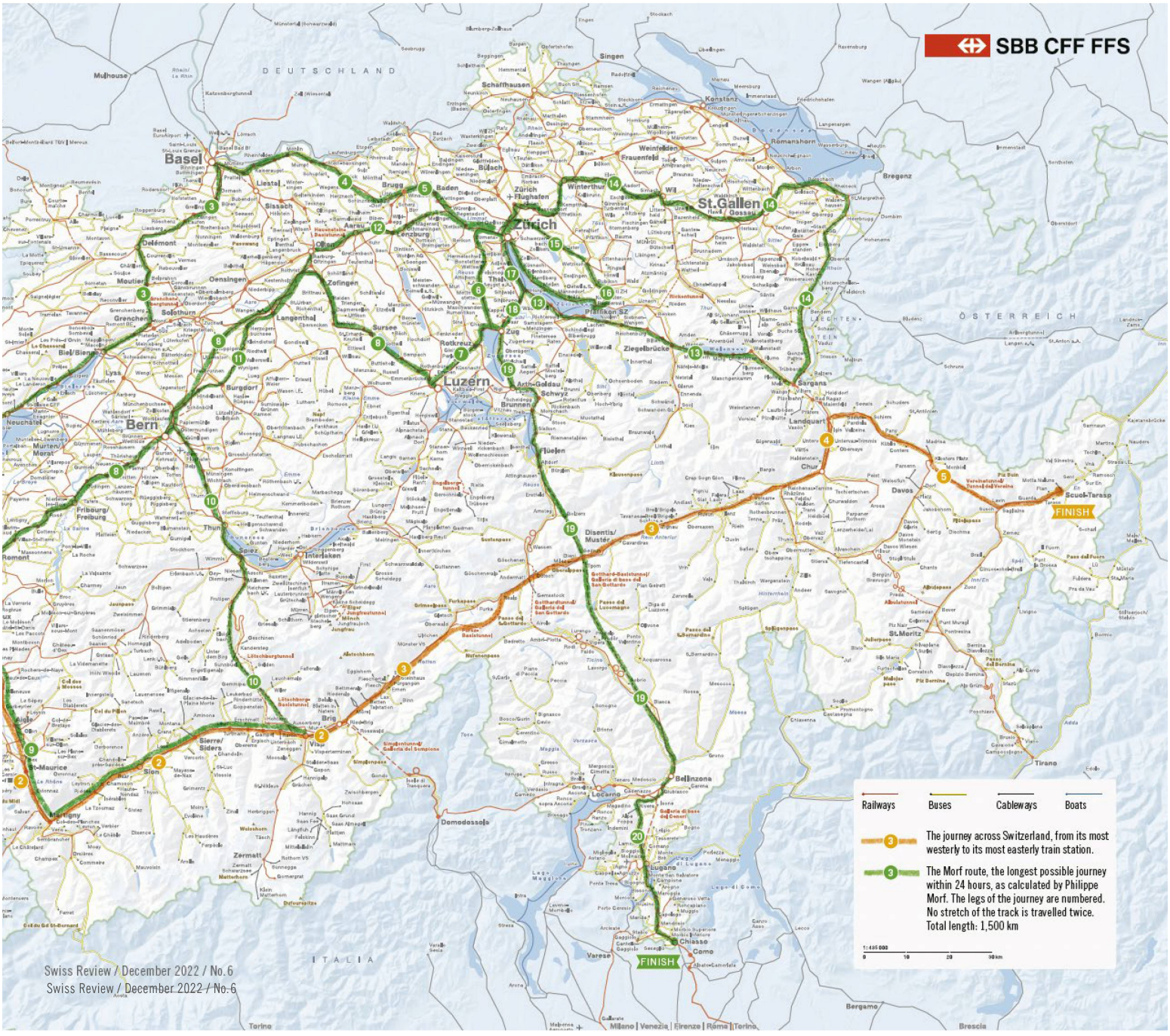
What is the best way to grasp the true scope of the Swiss rail network? We chose to make the longest possible journey from west to east. This 461-kilometre trip links La Plaine (GE) to the Scuol-Tarasp station in Grisons, where the line ends. Our journey began in the early hours of the morning at the small station that marks the last stop before France. From Geneva to Brig, the train bound for Venice raced past. In Brig, the red cars of the Glacier Express were filled with tourists from all over the world. The journey to Chur via the Oberalp Pass, at an altitude of over 2,000 metres, seemed to flash by. We shared a table with a couple from Atlanta and an IT specialist from India. The former spoke of "unreliable" American trains, while the latter bemoaned "overcrowded" trains in his homeland. We changed trains in Chur bound for Landquart. From there, the train headed south-east and then east, gliding through the long Veraina tunnel. We passed through the Müstair valley, where castles perch on towering peaks and villages have lilting names like Sagliains, Lavin, Guarda and Ardez. In Scuol-Tarasp, the arrival announcement was made in Romansh. After our 10-hour journey, it felt like we had arrived in another country. (SH)

Swiss Review / December 2022 / No.6

says Clédat, who points out that “a train journey pollutes much less than four people driving in a car”. They both admire the Swiss network’s density. “It’s unlike the French network, which is designed as a radial system, with Paris at its centre,” Clédat says, and he regrets that many shorter lines in his country have been abandoned. “The Swiss network has evolved in this way because Switzerland doesn’t have an automobile industry,” Lauinger surmises. He describes the German network as less centralised than in France, but one that operates on a just-in-time basis. “In Switzerland, trains aren’t al-



La Plaine (GE), the most westerly railway station in Switzerland, shown here in the dark. La Plaine is the starting point of the great west-east crossing.
Photo: Stéphane Herzog



Swiss Review / December 2022 / No.6

The atmosphere in commuter trains is often the same as in the office: these trains have become a workplace for many. Photo: Keystone

ways run at maximum speed, which leaves room to make up for potential delays."

Trains now doubling as offices

As stated above, trains are going faster, and new technologies have transformed them into moving offices. "A daily journey of 90 minutes isn't a problem as long as you can work during it," says Vincent Kaufmann, a professor of mobility analysis at EPFL. True, "but only if you have a first-class ticket", comments Pierre Dessemontet, a geographer who studied with Kaufmann and is currently mayor of Yverdon-les-Bains. The two specialists researched the impact of Zurich's suburban rail network on urban sprawl. "In the 1990s, longer commuter distances were covered by car, whereas from 2000 onwards, trains have taken over," explains Kaufmann. Expanding rail networks contribute to the spread of built-up areas, but this is not a new phenomenon. "In the 19th century, the development of tram lines led to the growth of towns and cities, thus causing urban sprawl," recalls Dessemontet. Unlike cars, which can spread out in all directions, "trains structure this development by concentrating urban development around stations", adds the geographer.

Trains separate home and work

Excellent rail connections can also encourage people to stay put. Instead of moving to Berne for work, a federal employee might choose to stay in Lausanne and commute. The carbon footprint remains positive, of course, since trains account for only 0.2 percent of the CO_2 emissions of all land based transportation. However, Kaufmann fears this trend could impact the good relations between the different regions in Switzerland. "In the past, a job in Berne, for example, required you to relocate and learn German or even Swiss German. Commuting by train reduces these obligations, which are also opportunities for cultural exchange."

The statistics give the impression that trains will one day be able to handle the majority of journeys. In reality, however, car usage continues to grow. No massive modal shift from individual motorised transport to public transport is evident. At the same time, many trains are crowded during rush hour. "They're used by long-distance commuters, in particular. So it would be hard to accommodate all the motorists as well," comments Kaufmann. According to government forecasts, demand for passenger transport is expected to increase by a further 11 percent by 2050. Meanwhile, Covid 19 has changed habits. "It's difficult to predict the long-term structural effects of the changes brought about by the pandemic, especially in terms of remote working. We would need to experience a normal year again, but instead we have the war in Ukraine, inflation and the energy crisis," remarks Dessemontet, the Vaudois geographer and mayor.

End of the platform at Scuol, the most easterly train station in Switzerland. This is where the West-East crossing ends. Photo: Stéphane Herzog

The world's densest network

With an average of 159 trains operating per day on each line, including freight traffic, the Swiss rail network is the densest in the world. According to the Swiss Public Transport Association, it almost doubled in size between 2000 and 2019, with the number of kilometres travelled on the rails reaching a peak of 21.7 billion in 2019. By October 2022, there were 406,000 GA Travelcards (unlimited travel on the entire network) in use, and 2.8 million Half Fare Travelcards. (SH)