

# WHAT? S-BAHNS IN THE U.S.A.?

**HANS-JOACHIM ZIERKE** EXPLAINS WHY S-BAHNS ARE SO POPULAR, BUT ALSO PREDICTS HOW AMERICAN CITIES COULD MESS THEM UP

## FIRST TIP: IT'S NOT LIGHT RAIL

The city of Karlsruhe labels its "streetcars on the mainline" system as "S-Bahn", because the green sign with the "S" is considered a label of success. Outside of Karlsruhe, most people will think of this as "S-Bahn" with huge quotation marks.

In my view, the Karlsruhe system is the best and most cost-efficient light rail system on the planet, but when talking about S-Bahn, this would mean the S-Bahn systems of Berlin, Hamburg, Munich, Stuttgart, Frankfurt (which, added up, transport the majority of rail passengers in Germany), or the "FLIRT"-based systems in Switzerland, or the S-Tog in Copenhagen, or the RER in the Ile de France ...

An S-Bahn system brings the features of heavy rail (high capacity signaling, quick acceleration, door arrangement for short dwell time, level boarding, high frequency with a memory schedule) to mainline railroad corridors. City traffic is accommodated by squeezing separated tracks into existing railroad ROWs.

## A COST-EFFECTIVE MODE

At locations where the best attempts at squeezing fail to generate a route, a tunnel section will be added. Towards the suburbs, where train frequency is lower, an S-Bahn will share tracks with other passenger trains and freight.

While the trains comply with European interoperability standards for mainline operation, they are built light and powerful. For example, the Swiss FLIRT reaches 60 mph after 28 seconds, 90 mph after 55 seconds. Because the S-Bahn is the slowest user of shared track, this performance buys track capacity.

Why is "S-Bahn" considered a label of success?

Munich got an all-new modern S-Bahn system for the 1972 Olympics, with a passenger estimation of 240 000 per day. In 1973, the ridership already reached 430 000, and the year 1976 saw more than 500 000 riders daily.

This kind of success was the turnaround point for public transport in Germany. After winning back tens of thousands of car drivers within a year, traffic planners started to understand the relation between door-to-door speed and public transport usage.

## THE ATTRACTION FACTORS

There were three main reasons for success in Munich:

- 1) The introduction of the S-Bahn was combined with the introduction of the Münchner Verkehrsverbund, "Munich's transit integration." This provided a seamless system of S-Bahn, U-Bahn, tram and buses, no barriers, no "transfers", one ticket valid for everything. In 1972, this was a new thing to have.
- 2) The speed of public transport in Munich was almost doubled.
- 3) The speed was **not** reached by leaving out stops, as it is often done in the USA, but by system performance. The old 1972 trains, now scrapped, could already reach 75 mph in 43 seconds.

Munich's S-Bahn network of 1972 was 224 miles long and had 136 stations, one station for 1.6 miles of track. The huge majority of S-Bahn passengers walk or cycle to their station, which, of course, means that the station must be placed within walking or cycling distance.

To illustrate the importance of walking and cycling to European rail success, the



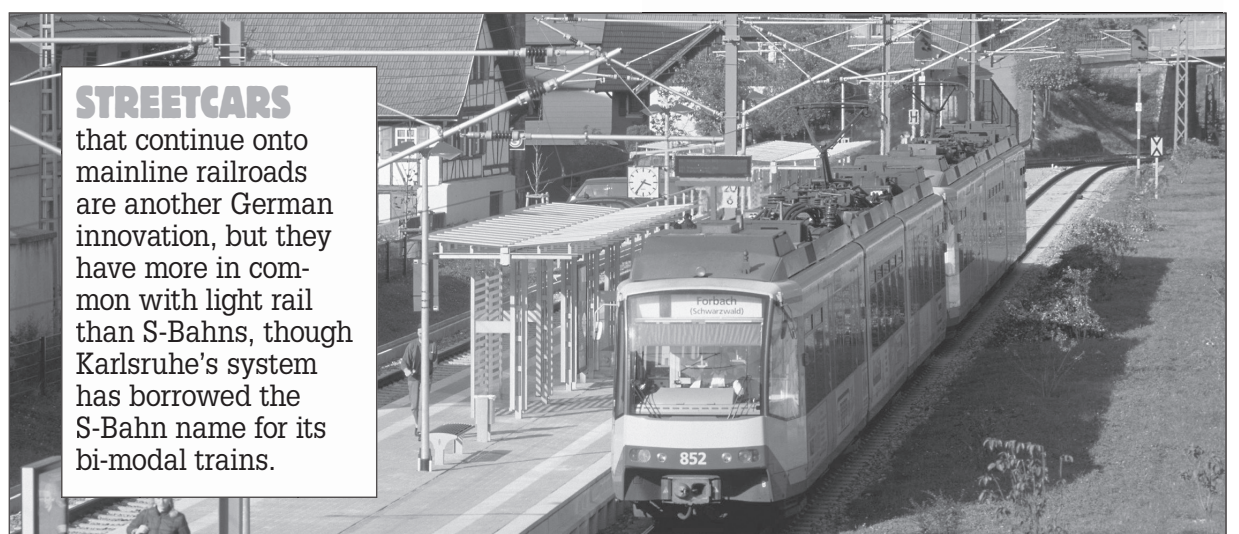
entire urban rail system of Munich, (S-Bahn + U-Bahn combined) has only 23,700 Park & Ride parking spaces to serve more than 1.5 million daily riders.

## HOW TO MESS UP A GOOD IDEA

Okay, now let's transplant such a system to the USA.

- 1) Because something like the new signal system of Caltrain is called "state of the art" (yes, I'm not kidding), speed will be reduced from 87 to 79 mph, and minimum train spacing will be doubled.
- 2) Since the trains operate on the main network, FRA compatibility will increase the weight of such S-Bahn train (4 sections articulated, same room as 3 railroad cars) from 116 to 185 tons.
- 3) After giving up on achieving the same performance (a Munich rush hour train at US weight would consume 11350 kW for acceleration, and multiple trains might accelerate at the same time), the trains will take 2 minutes to accelerate instead of one.
- 4) FRA strength regulations will require less and smaller doors. Maximum rush hour station stop time will increase from 30 seconds to 1 minute.
- 5) The good people at the USA West Coast will build the platforms at 8 inches, instead of level boarding, increasing the maximum rush hour station stop time from 1 minute to 1:30.
- 6) The trains will make their station stops with lots of noise. As a result, residents will not accept stations in their neighbourhood, and the stations will not be built in residential areas, but in some industrial settings in the least inviting parts of the city. This will reduce ridership by perhaps 40%.
- 7) Should it happen, that 6) does not apply, zoning rules will strictly avoid to have central functions of a city quarter, and higher density, near the train station.
- 8) Should it happen, that 6) does not apply, missing sidewalks, missing pedestrian crossings, and streets designed for blocking any through traffic, pedestrians included(!), will make sure that the good location isn't honoured by good ridership.
- 9) The bus network will not be centered on the S-Bahn stations, but stay independent. This will avoid the export of S-Bahn speed into the bus network. Instead, buses will run parallel to the S-Bahn, eating up the subsidies, which European cities would use to run more feeder lines to trains.
- 10) Should it be unavoidable, that a bus stop is located near an S-Bahn station, the bus company will create at least a half mile walk.
- 11) Buses and other transit operations will have their own ticket system.
- 12) The ticket system of the S-Bahn will get designed to generate a maximum of costs. Manned stations with barriers, no attractive offers for season tickets covering the whole transit network, etc. pp. ...

Magically, that USA system will attract 20% of the ridership, compared to European operations, and the conclusion will be, that such foreign stuff can't possibly work in the USA.



### STREETCARS

that continue onto mainline railroads are another German innovation, but they have more in common with light rail than S-Bahns, though Karlsruhe's system has borrowed the S-Bahn name for its bi-modal trains.