

Introducing New Commuter Rail Service on Busy Routes Case Study: StadtbahnZug

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Presentation Outline



1. Introduction: the Canton of Zug
2. Rail System Planning in Switzerland
3. StadtbahnZug! - Idea to Implementation
4. Lessons Learned



1. Introduction: Canton of Zug

- Central Switzerland
- Generally rural with strong central city (Zug)
- Many employment, cultural & recreational opportunities
 - 40 minutes to Zurich
 - 20 minutes to Lucerne



Growth in Zug (Canton)

	2000	Growth Since 1960	Forecast Growth 2020
Population	103,000	2x	20-35%
Employment	56,000	3x	10-30%
Number of Companies	19,000	10x	--

Growing traffic congestion

- Congestion impacts both auto traffic and bus service!
- Impact on transit:
 - Higher costs
 - Less reliability
 - Fewer passengers
- Leaders realized that something needed to be done.

2. Rail System Planning in Switzerland

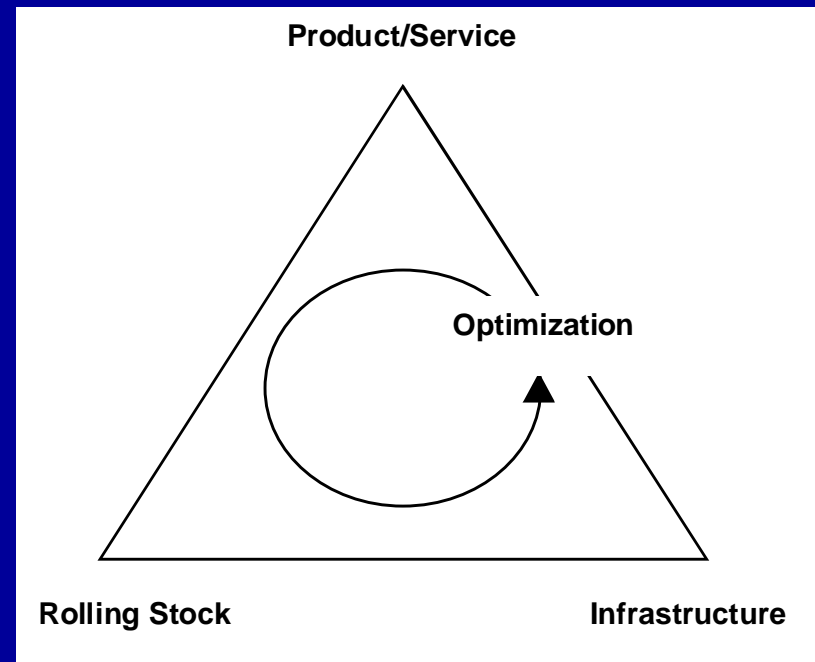
- Focused on national network with frequent service;
- Integrated clock-face headway (timed transfer) system called “**Taktfahrplan**”
 - Adopted after defeat of HSR proposal (1970s);
 - Zurich was first hub (1982);
 - Bahn 2000 expanded this system by adding capacity and reducing travel times between cities to “necessary” levels = more hub cities.

Identify most efficient solution

The basic approach is to balance improvements in:

- Infrastructure;
- Rolling Stock; and
- Schedule

... to meet national
Taktfahrplan timetable.



3. StadtbahnZug! - Idea to Implementation

A. Initial Planning and Politics

B. StadtbahnZug! - The Project

C. Marketing

D. Initial Results

A. Initial Planning and Politics

Initial Planning

- Begins in 1990s due to growing traffic congestion and air quality concerns;
- Several types of public transit considered:
 - Underground rail;
 - Tram lines;
 - Elevated rail;

Stadtbahn Concept

S-Bahn



Tram



Stadtbahn

Stadtbahn

- Combination between S-Bahn and Tram;
- Karlsruhe (Germany) is a famous example;
- As studies proceeded planners realized that it would be difficult to use streets and thus concentrated on providing “tram-like” service on the existing rail right-of-way only.

Zug: cities and rail lines



Detailed Planning

- Heavily used rail infrastructure;
- Single track sections & bottlenecks;
- Therefore: planners focused on how modern rail technology & minor infrastructure improvements could be combined to provide capacity for new service.

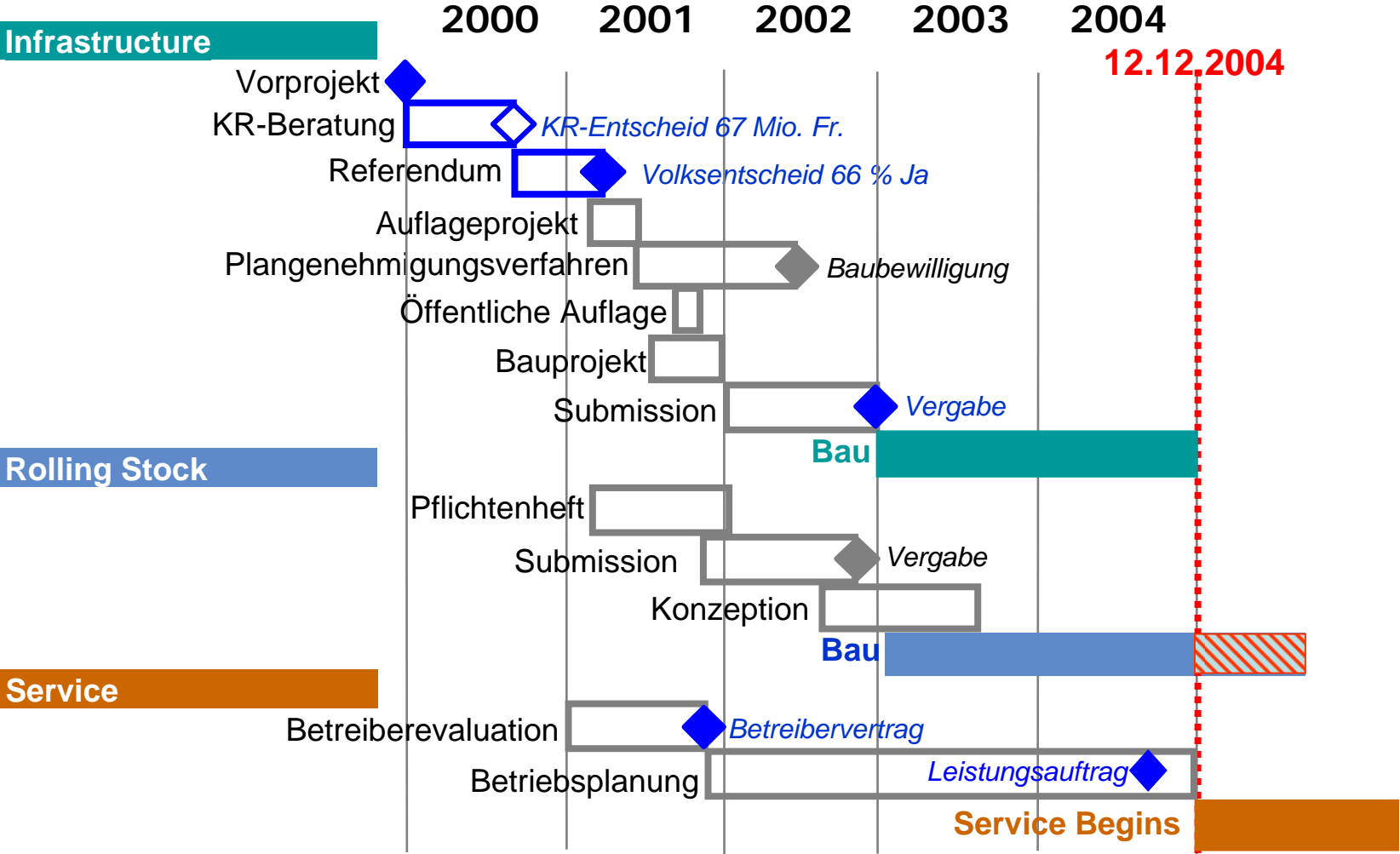
Politics

- Recommended plan added local rail service on two lines (one every 15-minutes) to 15 stations;
- Cantonal legislature approved 70 million CHF (\$56 m) funding for the Stadtbahn project;
- Citizens group collected signatures for referendum, saying: people should vote on such a large expenditure and that there was not enough information;
- Voters approved project 66% Yes (March 2001).

Design, Construction and Implementation

- November 2001 - SBB signs contract to operate Stadtbahn service;
- Mid-2002 - Infrastructure planning completed;
- February 2003 - Construction begins;
- December 12, 2004 - Service inaugurated.

Timeline



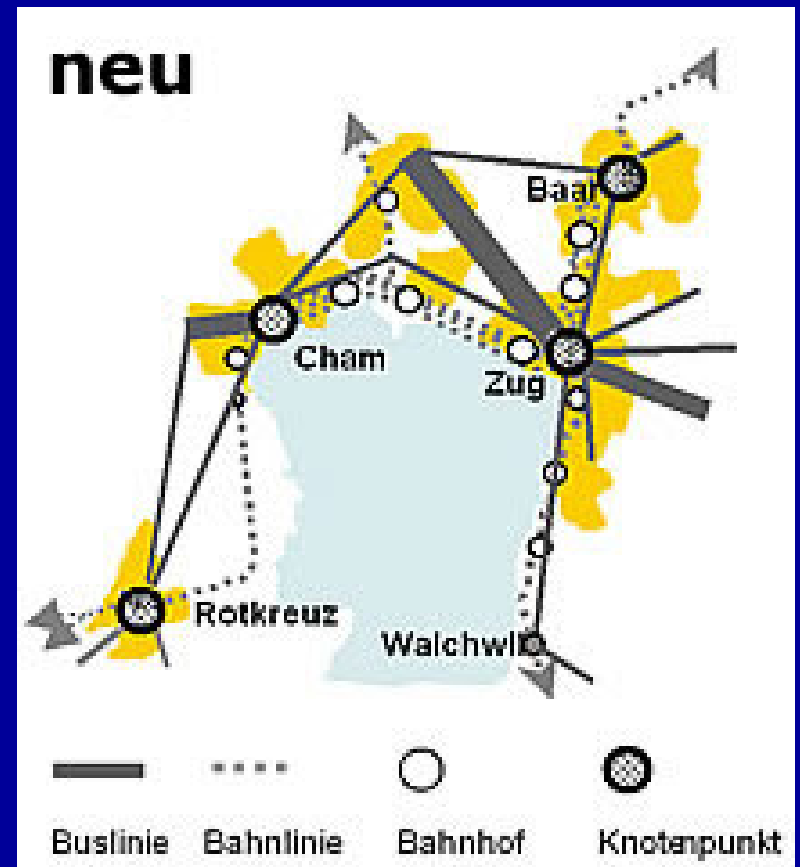
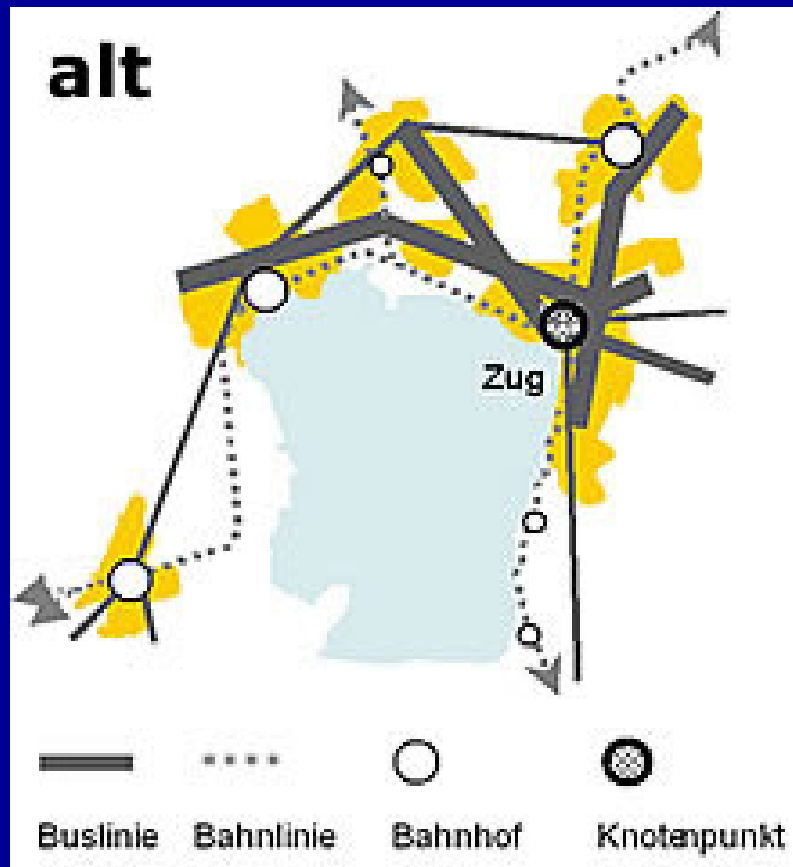
B. StadtbahnZug! - The project

- Integrated Public Transit Service Concept
- Infrastructure Improvement Program
- Rolling Stock

Integrated Public Transit Service

- Re-orient bus network to Stadtbahn stations;
- Timed-transfer system;
- Integrated fares/ticketing;
- Advanced passenger information system.

Old and new bus service concepts



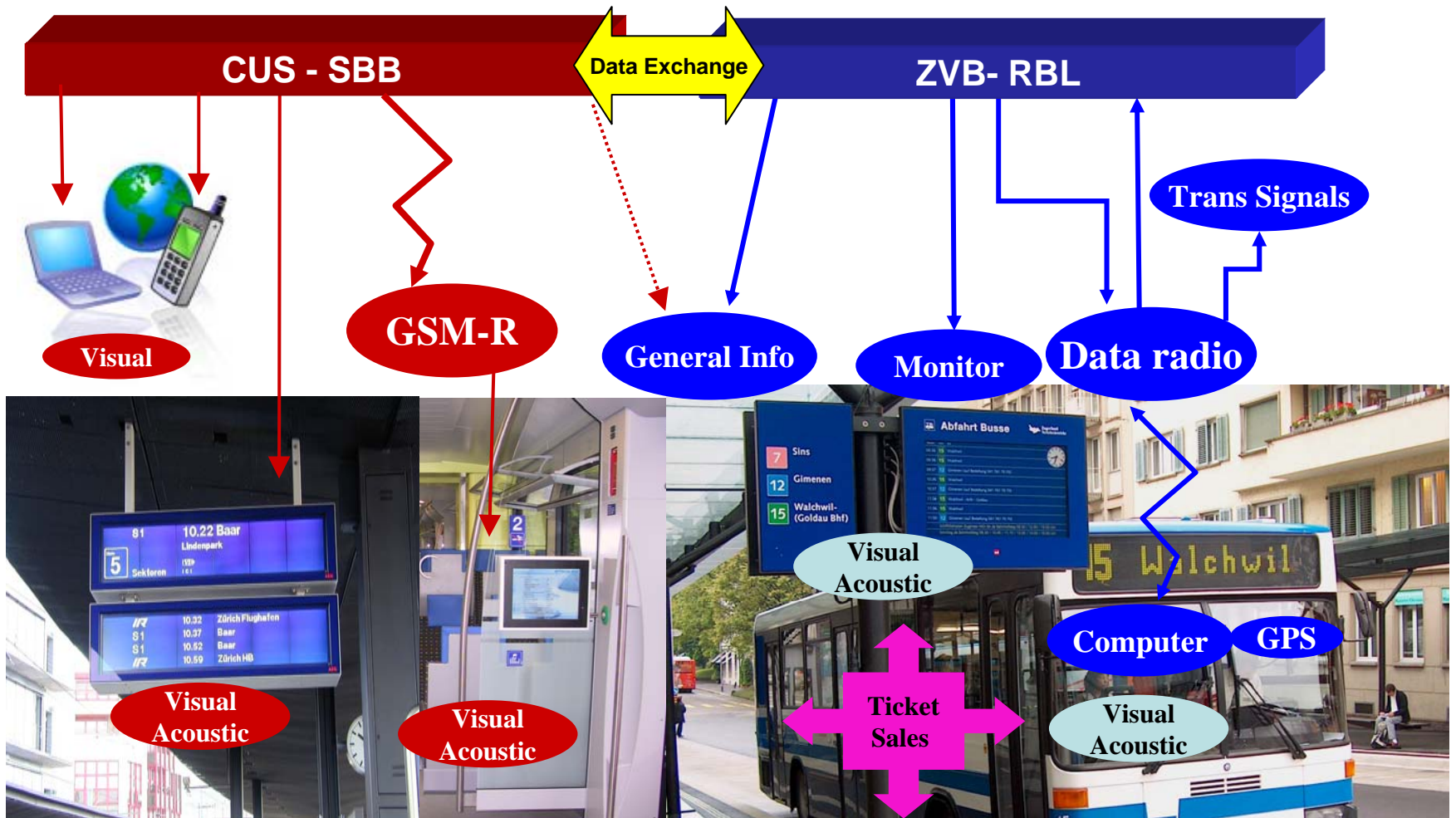
Improved Travel Times (even with bus transfer)

Representative Trip	Stadtbahn	Bus	Auto
Cham (Center) to Baar (Neufeld)			
Uncongested	11	25	12
Existing Peak	11	30	17
Future Peak	11	37	25
Future Savings		236%	127%
Huenenberg to Zug (Center)			
Uncongested	17 (bus x-fer)	22	13
Existing Peak	17 (bus x-fer)	25	17
Future Peak	17 (bus x-fer)	32	25
Future Savings		88%	47%

Real time multi-modal information system



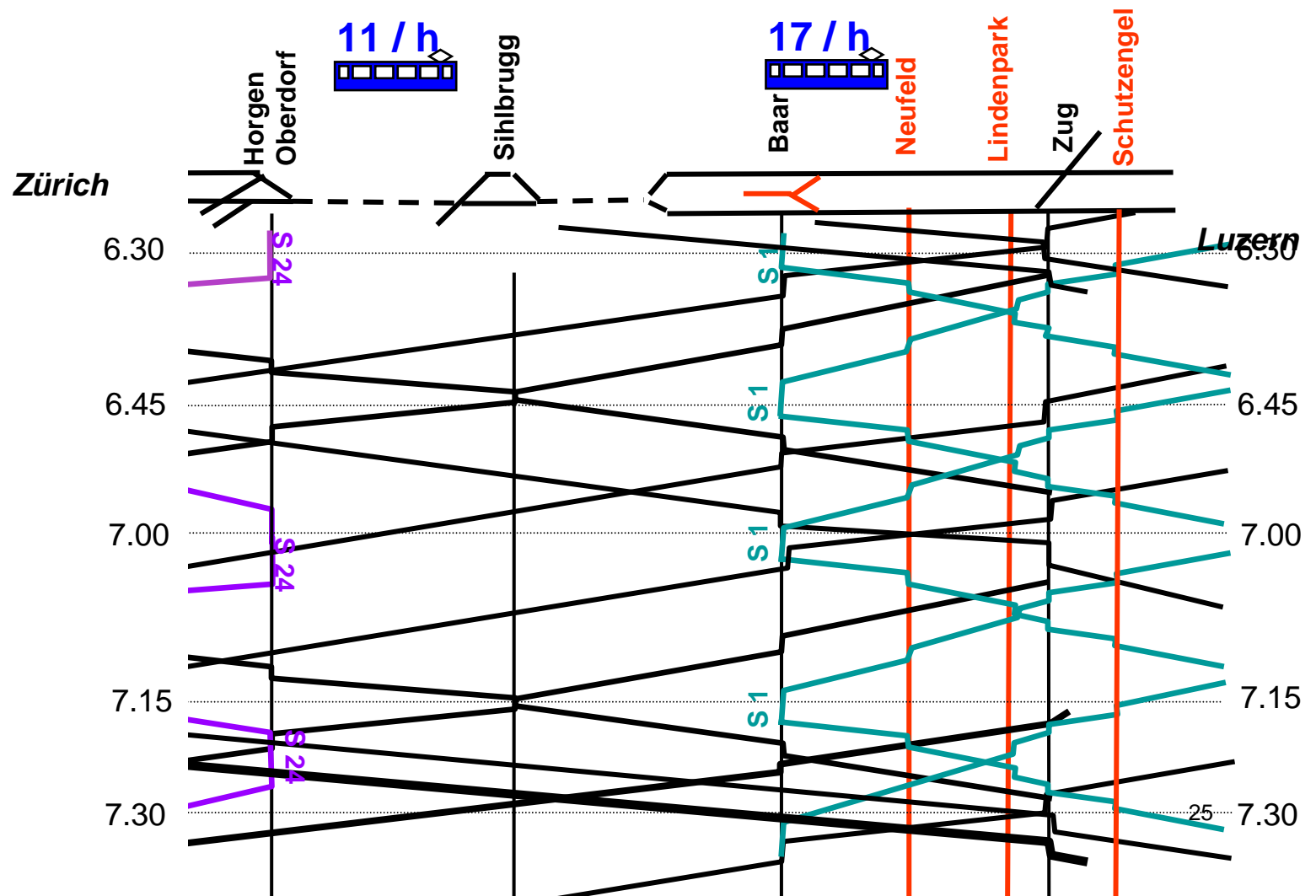
The devil is in the details!



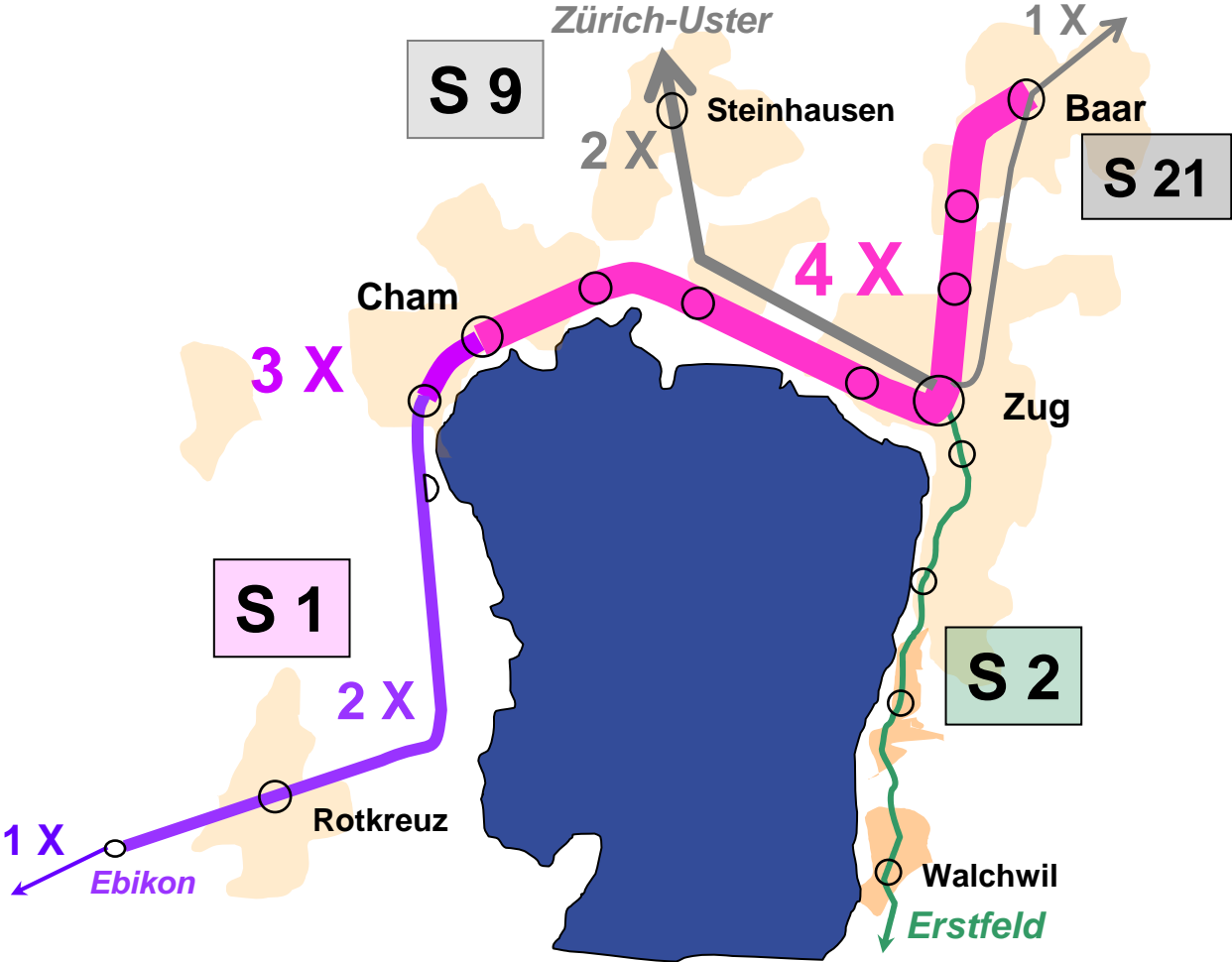
Infrastructure Improvement Program

- Rail infrastructure (track, signaling);
- Existing stations;
- New stops;
- Bus transfer - station areas;
- Passenger information system.

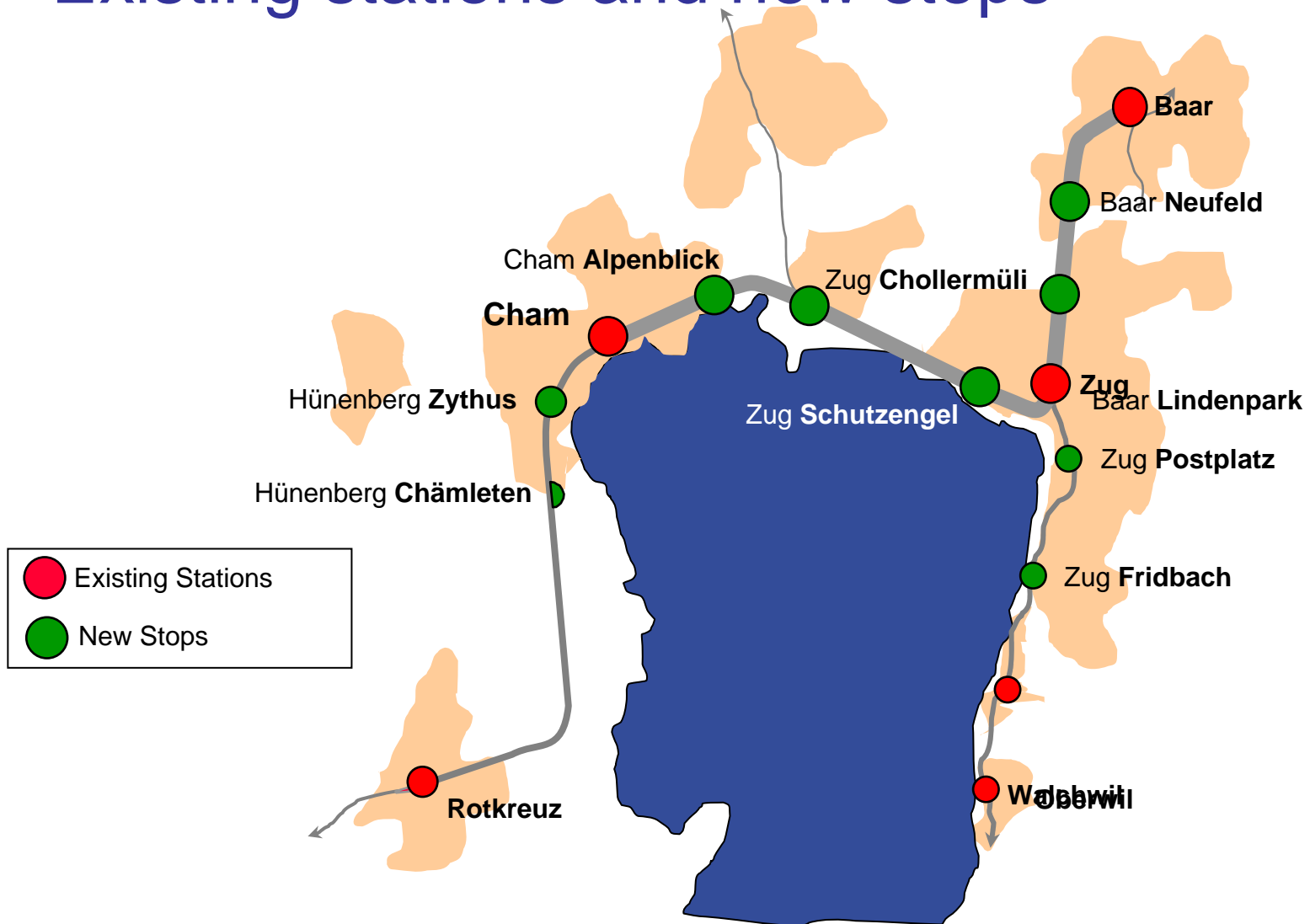
Rail improvements on a congested route



Service pattern adjusted to fit capacity



Existing stations and new stops



New stop design

- Bright red = identity element
- Structure - much was prefabricated to reduce costs & speed construction (active railroad);
- Accessible - ramps and stairways;
- Station elements - simple, transparent;
- Length - 150 meters.









Rolling Stock

Vehicle performance = key system variable to reduce infrastructure costs; performance goals:

- High rate of acceleration/braking;
- Short station dwell times =
 - Many wide doors;
 - Lots of circulation space;
 - Level boarding.

Vehicle design and procurement


- Designed by SBB with input from Canton Zug and interest groups (accessible design);
- Open competition for contract;
- Stadler, a Swiss rail car manufacturer, won contract;
- New vehicle: FLIRT.

FLIRT

- FLIRT: Flinker, leichter, innovativer Regional-Triebzug (Fast, light, innovative, regional train).
- Cost: approximately \$6.25 million each.
- Capacity: about 400 (150 seats), accessible toilet, level floor.
- FLIRT vehicles are very popular with other agencies.






Bitte festhalten, stark wirkende Bremsen!
Veillez bien vous tenir, freinage puissant!
Tenetevi saldi, l'azione frenante è potent
Please hold tight, powerful brakes!


Selbstkontrolle
 Bitte beachten und dabei anhalten! Die Brems- und Türsysteme sind während der Fahrt gesperrt.
 Bitte halten Sie sich an folgende Regeln:
 • Halten Sie sich an die geltenden Verkehrsregeln.
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CHF 80. —

Autocontrôle
 Veuillez s'y tenir, action de freinage puissante. Les portes et les systèmes de freinage sont bloqués pendant le voyage.
 Veuillez vous tenir à ces règles:
 • Respectez les règles de circulation.
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Autocontrollo
 Viaggiate sitti, azionata a fricu potenti. I sistema di frenata e di trasportu sò bloccati duranti u viaggju.
 Viaggiate sitti a queste regule:
 • Respetta le regole di circolazione.
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Self-check area
 Please pay attention and stop! The brake and door systems are locked during the trip.
 Please pay attention to the following rules:
 • Observe the traffic rules.
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C. Marketing

- Integral part of entire StadtbahnZug project;
- Why? - Swiss citizens vote to provide funding for many major infrastructure projects;
- Good marketing/public relations program helped form the basis for the political committee needed in the referendum campaign.

Marketing techniques

- Initial discussions with groups & public to help plan system;
- Organized conference: “Innovation in Regional Transportation during the next Century”
- “Lust auf Stadtbahn” exhibit at civic events;
- Political campaign;
- Newsletters, website (www.stadtbahnzug.ch).

D. Initial Results

- Service began December 12, 2004;
- Ridership for bus & rail system up by 5% with train ridership on some segments up by 30%.
- Very high level of customer satisfaction.



Initial Problems

- Not enough FLIRT vehicles –
... more vehicles delivered;
- Longer than expected turn-times –
... additional driver;
- Operational delays –
... schedule fine-tuned;
- Passenger information system –
... work in progress.

4. Lessons Learned

- Stadtbahn concept has provided Zug with an attractive transit service at a reasonable cost;
- Careful planning was needed to make the project a success;
- Teamwork among the many agencies and private companies involved was critical to meeting deadlines and budgets.

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