

Zurich Public Transport - Questions and Answers

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Note: This document consists of answers I provided to a newspaper reporter from the Straits Times Newspaper (Singapore) in response to a series of questions he asked regarding public transport and transport in-general in Switzerland and Zurich.

Introduction: Zurich's Public Transport and Quality of Life

There is a very good article about living in Zurich written by Alain de Botton, "The discrete charm of the Zurich Bourgeoisie" ... that discusses Zurich's public transport system. According to de Botton,

"There are communities, far rarer, many of them imbued with a strong (often Protestant) Christian heritage, where the public realm exudes respect in its principles and architecture, and where the need to escape into a private domain is therefore less intense. Citizens may lose some of their ambitions for personal glory when the public spaces and facilities of a city are themselves glorious to behold. Simply being an ordinary citizen can seem like an adequate destiny. In Switzerland's largest city, the urge to own a car and avoid sharing a bus or train with stranger loses some of the urgency it may have in Los Angeles or London, thanks to Zurich's superlative tram network - clean, safe, warm and edifying in its punctuality and technical prowess. There is little reason to travel alone when, for only a few francs, an efficient, stately tramway will transport one across the city at a level of comfort an emperor would have envied."

The following information describes some of the technology, public policy and management supporting Zurich's system. The information was prepared in response to a reporter's questions. I should note that these answers are impressions based on general system knowledge rather than detailed data, and, are biased since as a US expatriate I am thrilled by the high quality and service provided in Zurich. Please contact me with corrections or suggestions.

What were the key issues that public transport aimed to solve in Switzerland?

Swiss cities, like cities throughout the world that developed before the invention of the automobile, has a long history of good public transport service. As competition from the automobile began growing significantly (after World War 2), existing cities were faced with a dilemma: build highways and parking to accommodate the automobile or encourage people to use public transport through a variety of incentives and disincentives. This is a dilemma that all cities face.

Most Swiss cities chose to invest in public transport and many of them also introduced disincentives for driving in central cities (e.g. parking restrictions). Public transport investments included funding for new vehicles, routes, network improvements (e.g. traffic signal prioritization systems) and service.

Some key reasons Switzerland supports public transport are common to many cities:

- Reduce Congestion - Each public transport passenger reduces the number of automobiles trying to use congested highways and parking.
- Air Quality - Efficient and well-used public transport helps reduce air pollution. Switzerland's strong air quality laws are one reason for supporting public transport and disincentives for automobile use.

- Reduce Impacts of Building Highways and Parking - It would be impossible to provide enough highways and parking for everyone who would like to drive without destroying the historic city centers and taking large areas of land outside cities. Public transport reduces the amount of land needed for transport facilities.
- Transport for All - Public transport can be used by everyone from young children (who are too young to drive) to elderly or handicapped people.

What was taken into consideration in erecting the Swiss public transport infrastructure?

Switzerland's public transportation system is a combination of national, regional and local transport operators. The Swiss Federal Railways (SBB) operates the national passenger rail system and regional trains in many urban areas. There are also several private companies offering regional rail road services.

Public transport service in regions is controlled by regional agencies. These agencies are responsible for coordinating and funding local and regional service. A good example is the Zurich region's Züricher Verkehrsverbund (ZVV) (www.zvv.ch/portrait/asp). The ZVV provides funding and planning for the Zurich region's 42 different public transport operators.

How are large new public transport projects financed?

Switzerland's form of government is very interesting. A large amount of funding for large regional projects, such as the Zurich Suburban Rail System comes from the local government (rather than the federal government as is common in the USA). Furthermore, Swiss citizens vote to approve most large expenditures. Zurich's transportation network has been built step by step through a series of votes where local citizens approved money to build various elements of the network. Most recently they approved building an expensive (slightly less than 1 billion euro) project to build a new underground rail route between the main rail station and a large outlying station. I mention this because it shows the support that Swiss and Zurich citizens have for their public transport system.

If people prefer public transport, why do you think in the Swiss case, this is so?

People in Switzerland are like everyone else, they generally make a rational choice on what type of transportation they use for a given trip based on the incentives and disincentives. The main incentive is that public transport in Switzerland is very high quality; specifically,

- service is operated at frequent intervals throughout the day;
- service is very reliable (it comes on schedule);
- service is relatively fast (in cities it is often faster than driving a private automobile);
- vehicles are clean and generally not too crowded;
- public transport is viewed as safe;
- the public transport network is very large - you can get almost anywhere in the country or region using public transport;
- service is relatively inexpensive and a variety of discount ticket programs are available for frequent public transport users;

The main disincentives for driving are:

- lack of parking in central cities;
- parking fees;
- roadway congestion and delays;

What is the public transport fare structure like? How much cheaper is it to take a bus or train than driving?

Public transport fares in Switzerland are relatively inexpensive. The fare structure is designed to encourage people to use the system regularly: for example: 24-hour pass generally costs twice the price of a one-way trip, a monthly ticket costs the same as about fourteen 24-hour passes and a yearly ticket costs the same as 9 monthly tickets. This fare structure encourages people to use public transport and also reduces administration costs for the public transport operators.

Interestingly, there is an annual national public transport pass issued by the Swiss Federal Railways that allows owners to use all the public transport systems including the national railroad throughout the country. It costs about 3,000 Swiss Francs per year (1,885 Euro). The SBB also offers a "half-price-ticket" which costs about 150 Swiss Francs per year and entitles the owner to half-price fares on the national rail system and about a 33% discount on public transit in the cities.

In terms of the cost of driving a private car versus using public transport, the Swiss Federal Railways (SBB) has a webpage that calculates and compares the costs for driving and public transport (the site is available in English at: www.mct.sbb.ch/mct/en/reisemarkt/abonnemente/vergleichsrechner.htm). Using the webpage to calculate costs for a typical commuter trip from a nearby suburb of Zurich to downtown Zurich showed that driving was about 61% more expensive than public transport (the model does not include parking charges so it probably underestimates the cost of driving into central cities).

My impression is that fares are not considered expensive by most people. They are happy with the quality of service and seem willing to pay. This is not to say that everyone agrees, some (often on the left politically) would like additional ticket price reductions to further increase the use of public transport.

How extensive is the rail and bus network?

Switzerland has an extremely dense network of public transport services. This network covers the entire country and includes intercity trains, regional trains, trams, urban and intercity buses, boats and cable railways. According to the SBB website the network includes 23,500 kilometers of routes (www.mct.sbb.ch/mct/en/reisemarkt/abonnemente/ga.htm).

One of the most significant advantages of Switzerland's public transport network, in addition to its sheer size, is its extremely high degree of coordination. The network is coordinated in the following ways:

- **geographic** - different public transport operators share the same stations stops, making it easy for passengers to transfer between vehicles;
- **schedule** - public transport operators coordinate their schedules so passengers can transfer between different services with a minimum amount of waiting time;
- **fare** - a single ticket can be used on all different public transport services making it easy and convenient for passengers to use the network.

While coordination sounds simple and logical, it is hard to implement. Switzerland needed to overcome many technical and policy problems in the process of coordinating its public transport network, but the end result is extraordinary and the system serves as a world model. The combination of a large network and a high degree of coordination makes it possible and attractive for people to use public transport.

How do you ensure things like accurate arrival times and congestion on the trains and buses?

One of the most important factors in attracting passengers to public transport is system reliability (buses and trains that operate on schedule). Switzerland has pioneered technologies that help ensure that trains and buses arrive reliably.

Many Swiss cities have implemented programs that provide priority for buses and trams. These programs built public transport-only lanes, installed traffic signal priority systems, re-designed roadways to facilitate bus tram movements and implemented new systems designed to keep buses and trams on schedule (e.g. control centers and dispatching systems). Zurich's public transport priority system is an excellent example. Zurich implemented a comprehensive series of transportation improvements designed to encourage public transport and alternative transport, discourage private automobile traffic and improve the city's livability (for more details see: [Implementing Zurich's Transit Priority Program](http://www.transweb.sjsu.edu/mtiportal/research/publications/summary/0113.html) available at: www.transweb.sjsu.edu/mtiportal/research/publications/summary/0113.html).

Switzerland also has a very heavily used national railroad network including regional trains which play a key role in the public transport system for larger cities. The Swiss Federal Railways has been a leader in the development and use of information technology tools to plan and operate its network. These tools have helped the SBB select infrastructure projects and vehicles that enable it to maintain relatively high schedule reliability.

What are some of the important things to remember when planning an efficient urban transport system?

An efficient urban transport system will minimize its operating costs and increase its revenues (by attracting more customers). Some key considerations for increasing ridership and reducing costs are:

- **Minimize Travel Time** - Minimizing travel time attracts customers and, since the vehicles can be used for more trips, reduces the cost of operations, significantly increasing system efficiency. This is one reason why improving the efficiency of existing public transport systems using public transport priority or bus rapid transit is such a good strategy.
- **Provide High Quality Public Transport Service** - Public transport service must be very high quality to attract discretionary customers (those who have a choice). High quality public transport is fast, reliable, frequent, safe, comfortable, relatively inexpensive, and goes where you want to go.
- **Coordinate Public Transport Services** - It is impossible to offer direct public transport service from every possible origin to every possible destination, therefore many passengers will always need to transfer. If public transport routes are coordinated geographically, temporally and with a common ticketing scheme, customers will be attracted to the service and efficiency will increase.
- **Introduce Disincentives for Private Automobile Use** - No matter how good a public transport system is, it will never be as good as driving an automobile parked at your home over uncongested roadways to a parking space at your destination for free. Therefore, in addition to providing the highest possible quality of public transport, there must be disincentives in place for driving. These disincentives include congestion, roadway tolls, parking restrictions, and parking charges.

What sort of monitoring is there to ensure compliance with standards for buses and trains, such as frequency etc are not compromised?

In Zurich there is an automatic system that monitors the position of buses and trams. The control center knows exactly where vehicles are at all times. The bus tram operators even have a display on their control panel that tells them if they are ahead of or behind schedule. This helps them drive the vehicles so that they maintain the schedule. The automatic location system was implemented in the 1980s before today's GPS and wireless communications and is based on relatively simple technology (wires in the ground).

Transport planners regularly analyze the tram bus schedule data to identify systematic delays or unreliability on routes. If problems are identified the routes are studied in detail to determine the problem cause and to identify solutions.

The real-time schedule adherence data is also used to make announcements to passengers about delays and problems as well as to control bus tram operations (in other words controllers redeploy the vehicles to avoid problems like traffic accidents that block tracks etc.). Controllers have pre-defined detours for all routes and scripts to read in announcing detours delays.

It is also important to emphasize that schedule reliability is naturally high due to Zurich's comprehensive public transport priority program, which optimizes the network to reduce public transport delays. The control strategies outlined above would not work as well in networks with many delays.

Switzerland's national railroad also uses automatic monitoring to ensure trains operate reliability and without delays. The IVT has helped develop some of the information technology tools used to identify problems and evaluate solutions. The Swiss Federal Railways has an extensive on-going research program to develop new strategies for increasing reliability.

What is the policy of private cars? Do people still prefer to drive, instead of taking the buses or trains?

Swiss people are not so different from anyone else; all other things being equal many would prefer to drive private automobiles; however, there are also many people who understand the environmental impacts of driving and support public transport and other non-auto-based transport (walking, biking).

Switzerland's regulations regarding auto ownership are not substantially different from those throughout Europe. The cost of gasoline is generally lower than other European countries and auto ownership rates are about the same. The auto ownership rate in Switzerland was 559 per thousand (in 2002) compared to 550 for OECD countries on average.

Most Swiss cities have planning regulations that control the amount and use of parking. Building new parking is generally discouraged (and sometimes prohibited). Some cities, notably Zurich, have implemented comprehensive programs to remove public parking, increase the price of parking and reduce commuter parking (by implementing resident-only parking zones). While cities throughout the world discuss these policies, Zurich is one of the few cities that have actually implemented them.

In addition to reducing parking, some cities have reduced the amount of roadway space. Generally this is not done with the intent of reducing private auto traffic, but rather with the idea of supporting other modes of transportation and or designed to improve safety or urban livability. A good example is designating an existing roadway lane for use by public transport only (meaning that it can only be used by trams and buses).

Is public transport in Zurich crowded?

Zurich's public transport system does not seem too crowded in comparison to major cities like New York, London, Paris or San Francisco. It is true that at rush hour many buses, trams, trains have standees, but it is rare that they are uncomfortably crowded as is often the case in other cities. There are a few routes that are very crowded, but generally this is only for a short distance and at peak times.

I have often wondered how Zurich does this. First, they operate a lot of service all day long. This means that people know that if they travel in the non-peak hours they still will not need to wait very long for a bus or tram. In fact many of the Zurich trams operate at the almost the same frequency from 7 am until 7 pm (every 6.5 minutes).

A second factor is that since the system has such a high degree of schedule reliability vehicles rarely are bunched (several vehicles arrive at the same time and then there is a long period before the next vehicle). When vehicles become bunched the first vehicle needs to carry many more people because more people are waiting at the bus stop since it has been a longer time since the last bus arrived.

Finally, a related point is that people trust the system to operate well all day long so they plan their travel - to the extent possible - to be as comfortable as possible (i.e. maybe they will go home a bit later or take a less crowded route).

On the suburban train network (S-Bahn), peak period trains are two or three times as long as regular trains, this means that many more people can be carried with minimal additional staff costs.

How hard is it to park in Zurich and how expensive is parking?

While parking in Zurich is limited, rates are about average for central European cities (but lower than major cities like Central London). The reason seems to be that most people know that parking is limited and know that public transport is a good alternative.

The main problem for automobile drivers in Zurich is the time needed to navigate through the city's fairly complex street pattern and then find a parking space. Since public transport is so good, it often takes less time to ride the bus than it does to drive and find parking.

The cost of parking in a typical city owned central parking garage in Zurich is available on the city's parking information website (www.parkhaeuser.ch/parking/de/home/fho.html). Zurich's parking rate structure (where the hourly rate goes from 3.5 to 5 as the parking duration increases) is fairly typical for cities that want to discourage long-term (all day) parking for commuters but still want to provide parking for people coming into the city for shopping or cultural events. There is also parking on the street, but much of this is designated for residents or has parking duration restrictions of less than two-hours.

How many Swiss people own cars?

The auto ownership rate in Switzerland is slightly higher than the OECD average (Switzerland has 559 per thousand (in 2002) compared to 550 for OECD countries). As an 'urbanized' canton, the Canton of Zurich has a slightly lower average auto ownership rate (505 autos 1000) and the City of Zurich has an even lower rate (415 autos 1000). These data are from the Canton of Zurich's Statistical Yearbook (2006). While these rates are lower than average, they are still relatively high (and remember, they do not include trucks and motorcycles). The total number of motor vehicles is 635 1000 in Zurich Canton and 519 1000 in Zurich City.

It seems to me that Swiss people use their cars a bit less than in other countries although I could not find any statistics.

Many Americans say that they do not use public transport because it is essentially impossible for them (it takes an unreasonable amount of time or simply doesn't go where they are going). Switzerland has made most of the country easily accessible via public transport and in so doing has given people a viable alternative to using the automobile.

What proportion of passenger traffic in Zurich is made by public transport?

From the internet:

"EVALUATION The customer-friendly changes of the public transport of the city of Zurich brought many new passengers. Between 1984 and 2002 the number of passengers increased from 209 to 282 millions per year (+35%).

The suburban railroad network (S-Bahn) was activated in 1990. In the first year of service the number of passengers on the network lines grown by 24%. The growing was than continuous and reached 87% in 2003.

In 2002, 322'000 people were entering the city daily for work or other reasons. 240'000 of them did it by train, using the suburban railroad network (74%). In the town of Zurich every fifth person with a driving license owns no car (22%) and only 62% of the persons with driving license has an own car that he can use at any time (the remaining 16% can use the car of a relative or friend after arrangement) Analyzing the daily average distance per person in the city of Zurich the good positioning of the public transport can be read. In average each person over 6 years old in the city of Zurich make 3,3 km (10.5%) on foot or by bicycle, 17,2km (54.6%) by motor vehicle and 10,3km using the public transport (32,7%). This is a very good value compared with the Swiss average of 17.7% public."

Source: www.cardiff.ac.uk/archi/programmes/cost8/case/transport/zurich.html.