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Mobility and Transport

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# Mobility and Transport

Pocket Statistics 2013



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**Federal Statistical Office FSO**

Neuchâtel, 2013

# Mobility and Transport

## Pocket Statistics 2013

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# 1 Parameters for transport

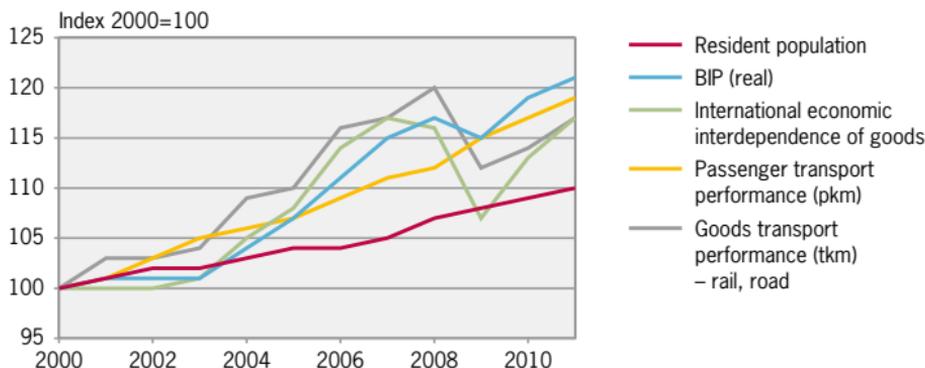
Passenger transport is growing faster than the population

Permanent resident population	7.95 m	End 2011
Increase in the resident population	10%	2000–2011
GDP (real)	CHF 587 bn	2011
Change in GDP (real)	+21%	2000–2011
Change in passenger transport prices	+11%	2000–2012
Change in goods transport prices	+14%	April 2001–Oct. 2012

The central transport parameters include demographic and economic development. At the end of 2011, around 8 million people lived in Switzerland – one tenth more than in 2000. As a measure for economic performance, the gross domestic product (GDP) rose by 21% over the same period. National and international economic interdependence also increased. These factors led to an increase in the volume of transport.

The amount of passenger traffic also depends on the distances between place of residence and place of work and the location of shops. In goods transport, the increasing division of labour and the concentration of production on fewer and fewer locations influence transport volumes. The price paid for the various transport modes also has a role.

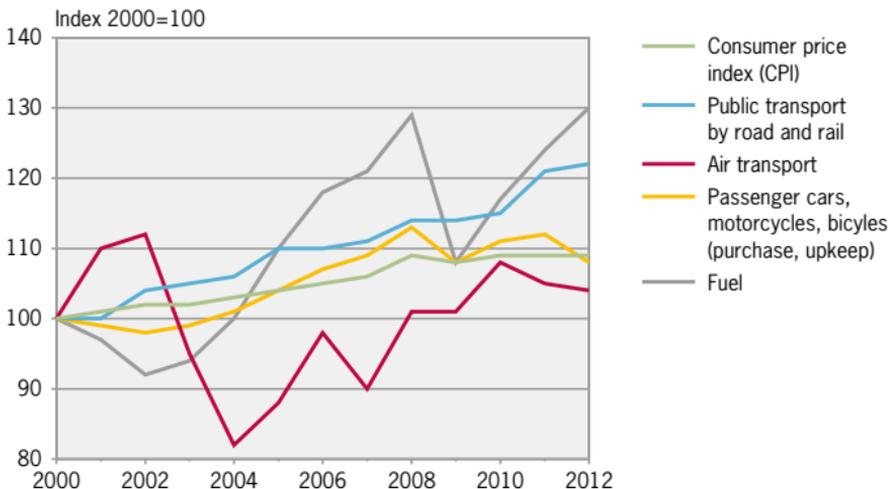
## Socio-economic framework for transport



Source: Federal Statistical Office

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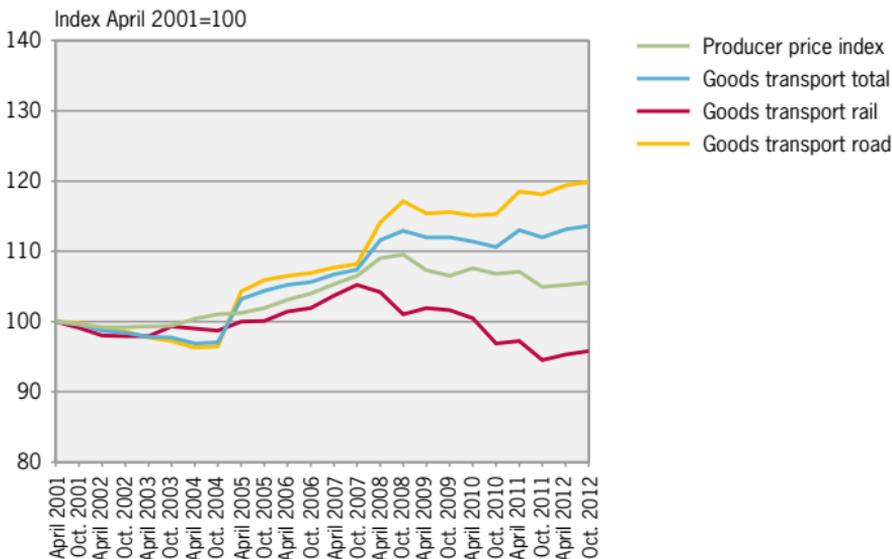
## Price movements in passenger transport



Source: Federal Statistical Office

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## Price movements in goods transport



Source: Federal Statistical Office

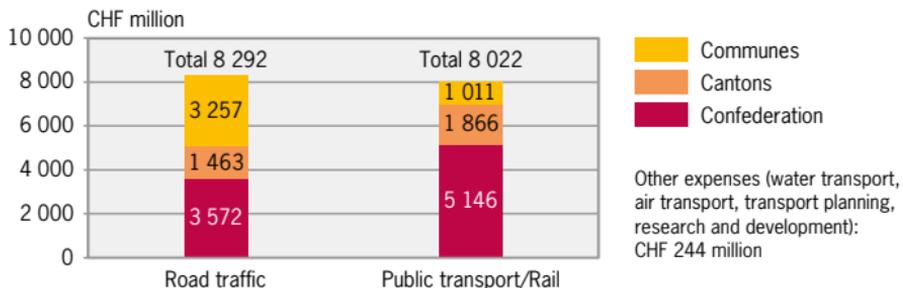
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## 2 Funding for transport

Confederation pays just over half of subsidies

Public expenditure on transport	CHF 16.6 bn	2010
Transport's share of total public expenditure	11%	2010
Confederation's share of public expenditure on transport	54%	2010
Road transport's share of public expenditure on transport	50%	2010

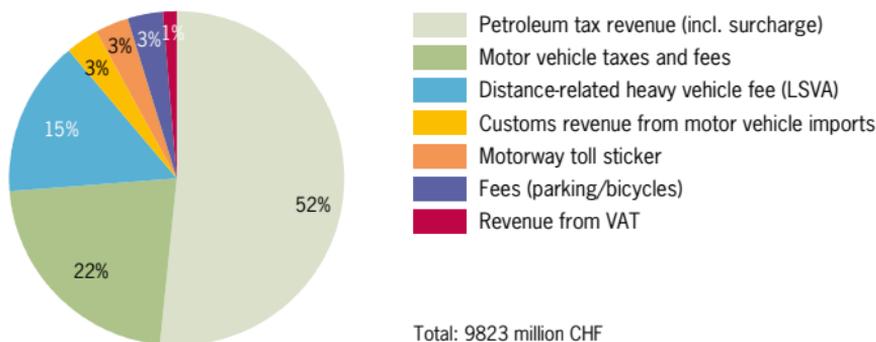
### Public expenditure on transport in 2010



Source: Federal Finance Administration

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### Revenue from road transport in 2010



Source: Federal Statistical Office

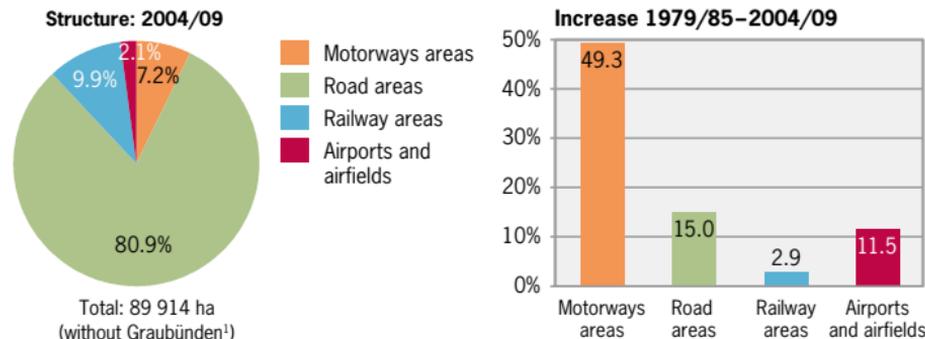
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## 3 Transport infrastructure

Transport infrastructure covers almost a third of settlement areas

National highways	1,799 km	2011
of which motorways	1,415 km	2011
Cantonal roads	18,027 km	2011
Communal roads	51,638 km	2011
Length of railway network	5,124 km	2010
Transport areas as a percentage of settlement and urban areas (Switzerland without Graubünden)	31%	2004/09

### Area occupied by transport infrastructure (without Graubünden<sup>1</sup>)

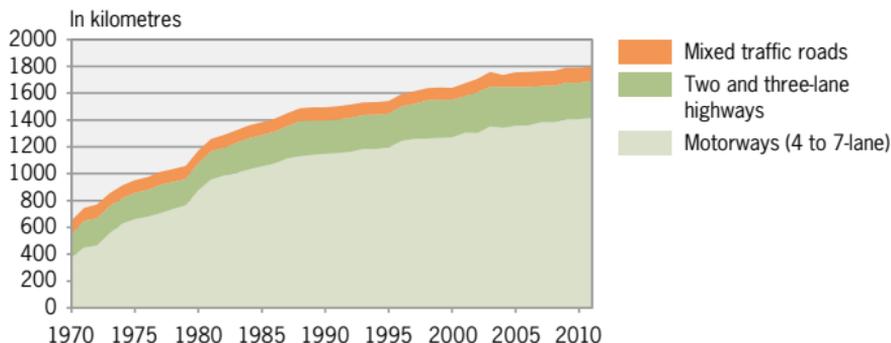


<sup>1</sup> In the survey period 1992/97, the traffic areas of Graubünden amounted to a total of 5298 ha (according to classification NOAS92).

Source: Federal Statistical Office

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### Length of national highways



Source: Federal Roads Office

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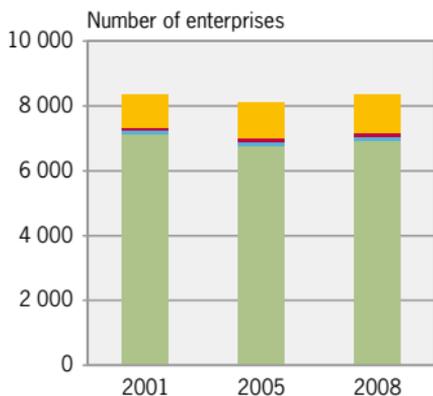
## 4 Transport enterprises

3% of all enterprises are active in the transport sector

Enterprises in the transport sector	8,341	2008
of which surface transport	6,919	2008
Employees (full-time equivalents) in transport	139,182	2008
of which surface transport	89,613	2008
Percentage of enterprises in transport sector	2.6%	2008
Percentage of employees in transport (full-time equivalents)	4.1%	2008

The number of enterprises in Switzerland was roughly 322,000 in 2008, about 3% of which were active in the transport sector. While the number of enterprises in land transport fell slightly between 2001 and 2008, the number of air and water transport enterprises grew as did that of other service providers in the transport sector. The total number of employees (full-time equivalent) rose by 8% between 2001 and 2008 to just over 139,000.

### Transport enterprises and employees

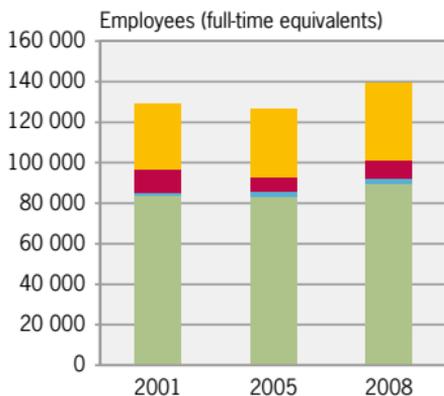


Land transport and transport via pipelines

Water transport

Air transport

Warehousing and provision of other services in transport sector



## 5 Means of transport

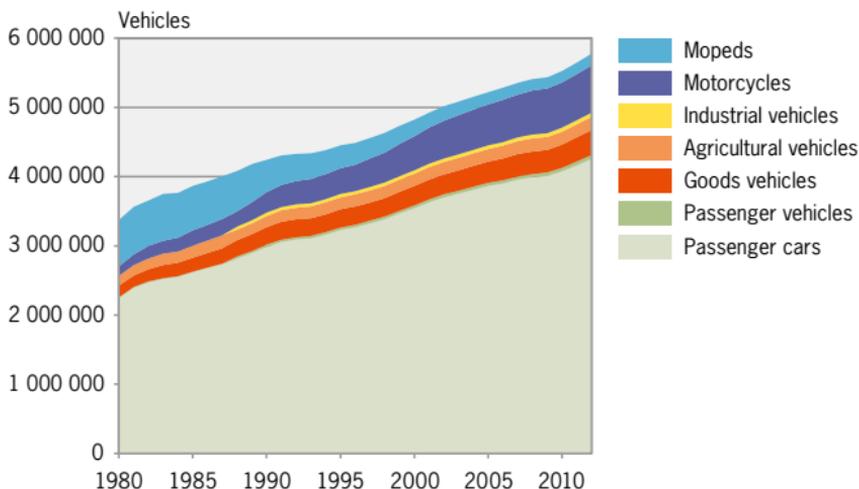
Over half as many private cars as inhabitants

Road motor vehicles	5.8 m	2012
Change	+71%	1980–2012
Private cars	4.3 m	2012
Goods vehicles	0.4 m	2012
Motorcycles	0.7 m	2012
Tractive railway vehicles	2,997	2010
Aircraft registered in Switzerland	3,657	2012

The pool of road motor vehicles has grown by just over two thirds since 1980 to 5.8 million. Around three quarters of them are private cars. Statistically speaking, therefore, one person in two owns a car; whereby the vehicle density varies depending on the canton. Moreover, for some time a trend towards four-wheel drive vehicles and diesel-powered vehicles has been observed.

There has been a particularly strong increase in motorcycles: their number has almost quintupled since 1980. In 2010, 69% of all households owned at least one bicycle.

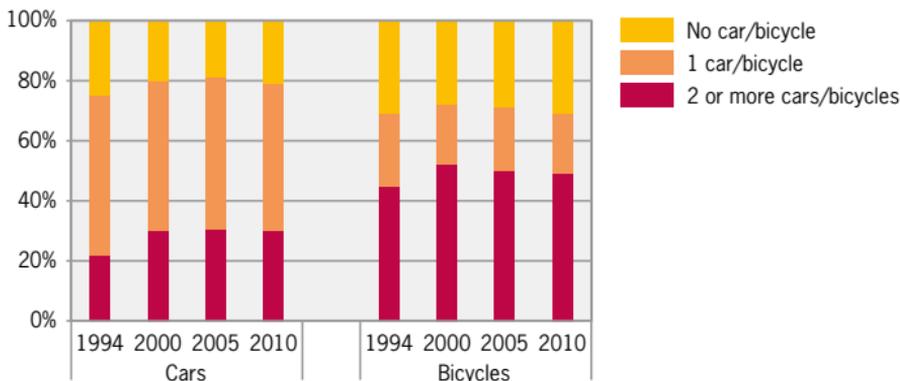
### Pool of road motor vehicles



Sources: Federal Statistical Office, Federal Roads Office

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## Number of cars and bicycles per household

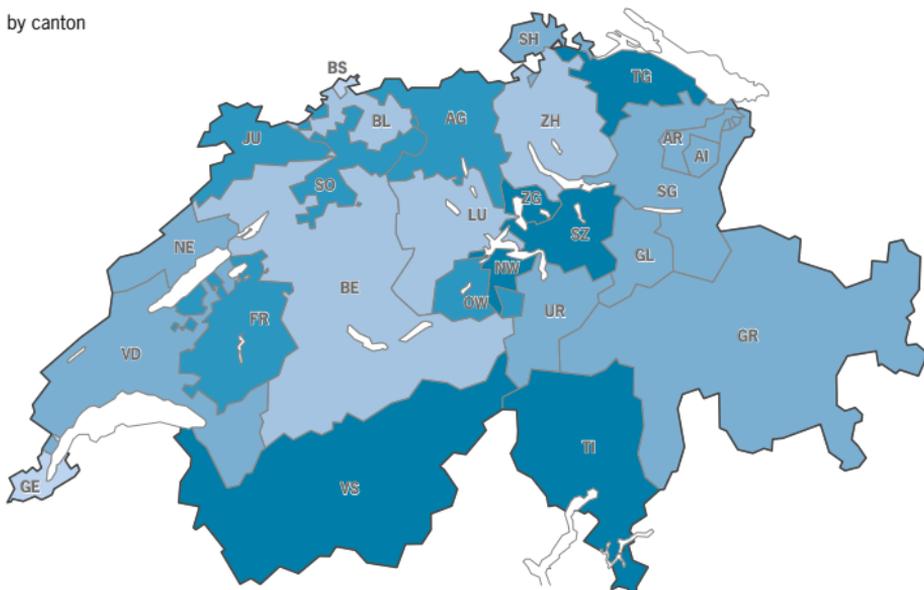


Sources: Federal Statistical Office, Federal Office for Spatial Development

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## Level of motorisation 2012

by canton



### Passenger cars per 1000 inhabitants

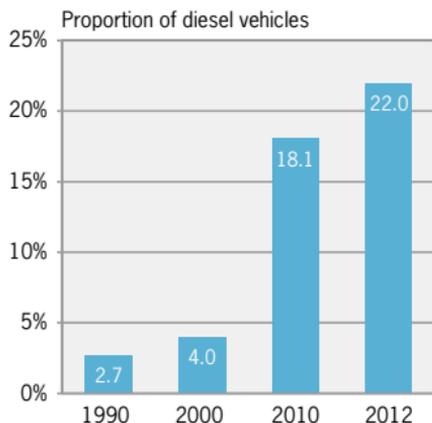
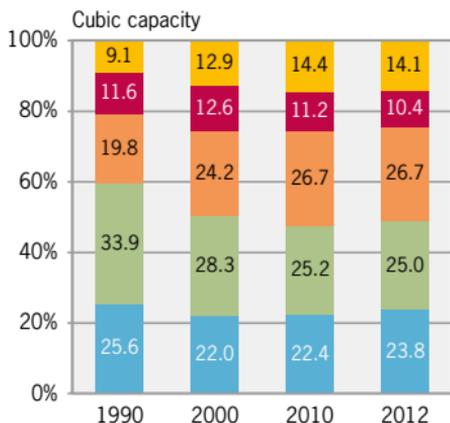


CH: 535

Source: Federal roads office

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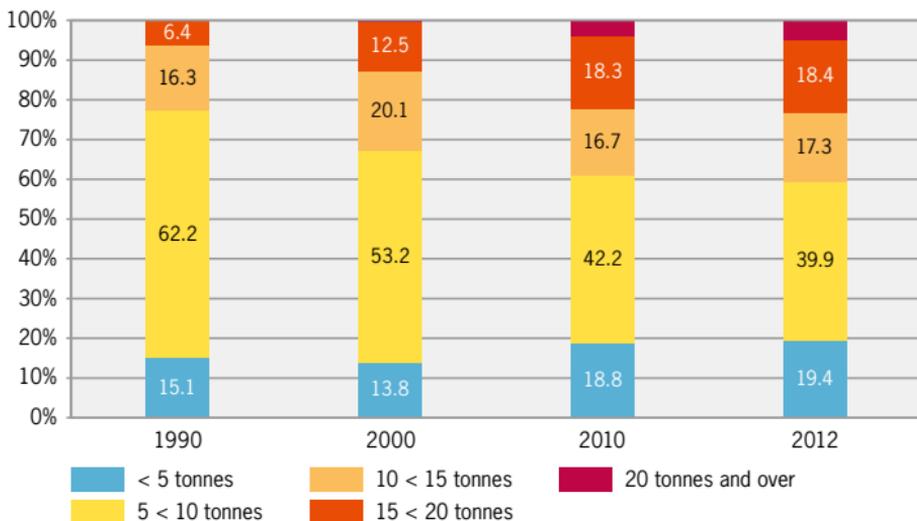
## Passenger cars by engine capacity and fuel



Sources: Federal Statistical Office, Federal Roads Office

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## Lorries by payload



Sources: Federal Statistical Office, Federal Roads Office

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## 6 Use of means of transport

Passenger transport by rail shows strongest increase

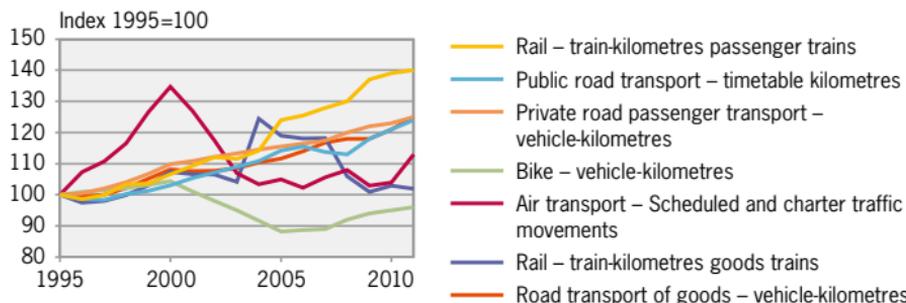
Kilometre performance of private motor vehicle traffic	53,591 m veh.-km	2011
Average occupancy of passenger cars	1.60 pers.	2010
Kilometre performance of road transport of goods	6,063 m veh.-km	2011
Domestic transport as a percentage of heavy road transport of goods	74%	2011
Takeoffs and landings in scheduled and charter air traffic	455,422	2012
Traffic jams on highways	19,921 hours	2012

Mobility needs can be met in various ways. The choice of transport means and vehicle occupancy influences road and rail traffic and affects the impact on infrastructure and environment.

In passenger transport, transport performance by rail has increased by 40% since 1995 and by road (private motor vehicles) by 25%. The kilometre performance of road transport as a whole also increased by 25% over the same period. In heavy goods transport, there was a shift towards semi-trailers.

The development of air transport can be gauged more easily on the basis of take-offs and landings in Swiss airports instead of covered distances. The reason for this is that scheduled and charter traffic originating and terminating in Switzerland largely involves routes over foreign territory. Movements at the three national airports (Zurich, Geneva and Basel-Mulhouse) more than doubled between 1970 and 2012.

### Kilometre performance



Source: Federal Statistical Office

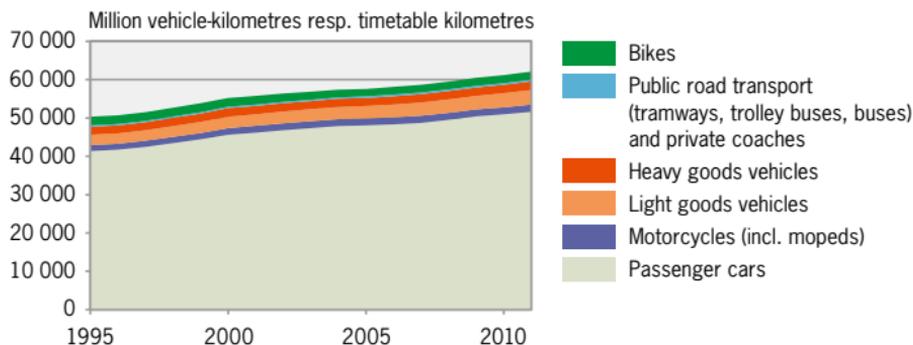
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## Kilometre performance or transport performance?

Kilometre performance is measured in vehicle-, train- or timetable-kilometres and is useful for gauging the impact on infrastructure and environment. This would hardly be possible with the transport performance indicator, measured in person- or tonne-kilometres, because a particular transport performance, depending on the occupancy and load, is achieved with a varying number of vehicles. Transport performance does, however, show the demand for mobility as well as the services actually provided by the transport system.

### Kilometre performance in road transport

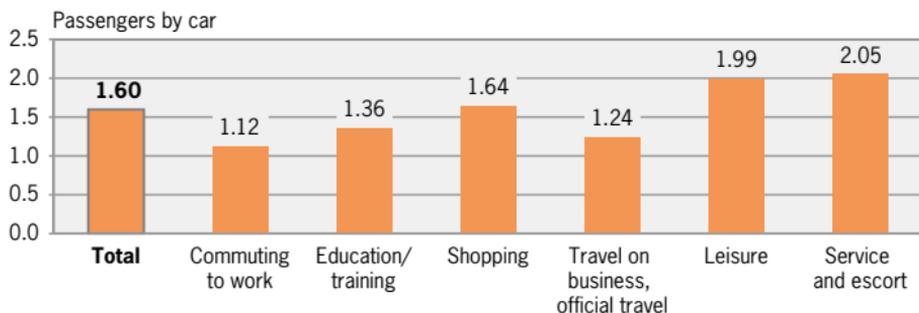


Source: Federal Statistical Office

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### Occupancy of passenger cars in 2010

(by trip purpose)

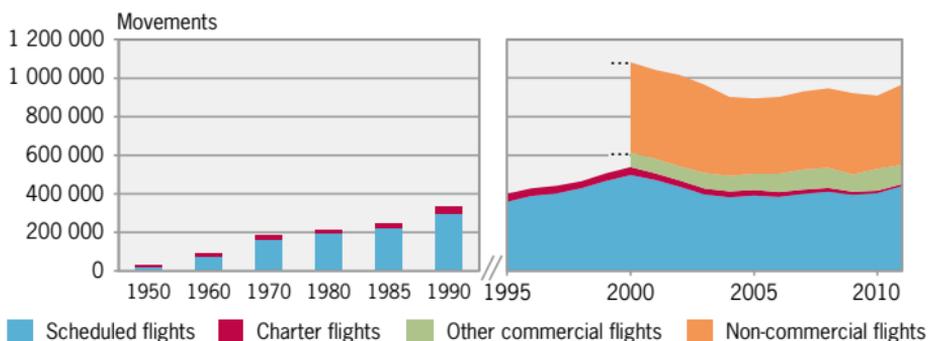


Sources: Federal Statistical Office, Federal Office for Spatial Development

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## Takeoffs and landings in civil aviation

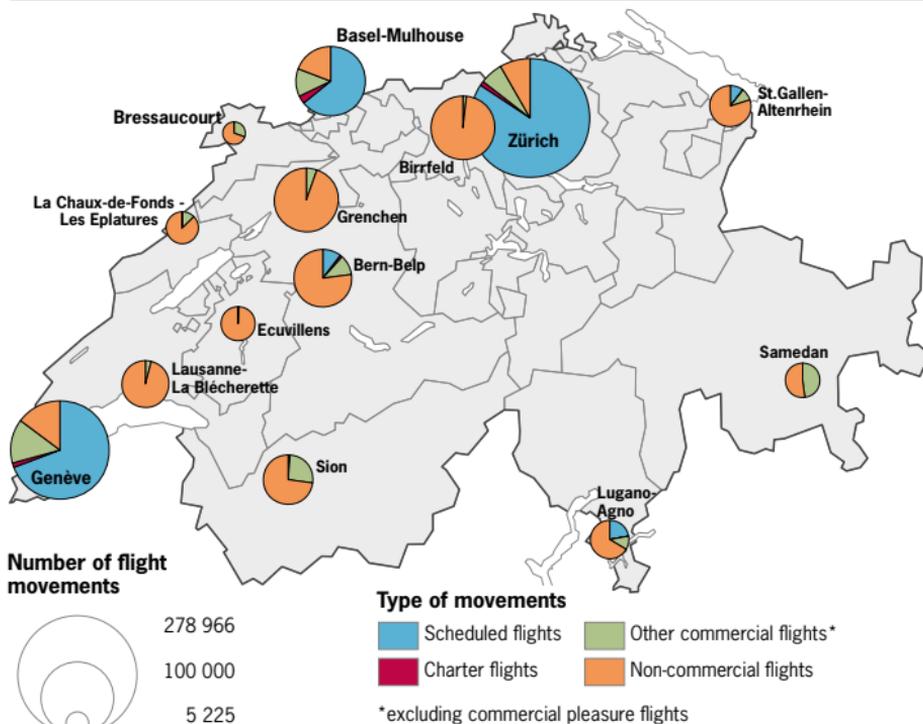
(National and regional airports)



Sources: Federal Statistical Office, Federal Office of Civil Aviation

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## Takeoffs and landings in civil aviation, 2011



Sources: FSO; FOCA

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## 7 Passenger transport performance

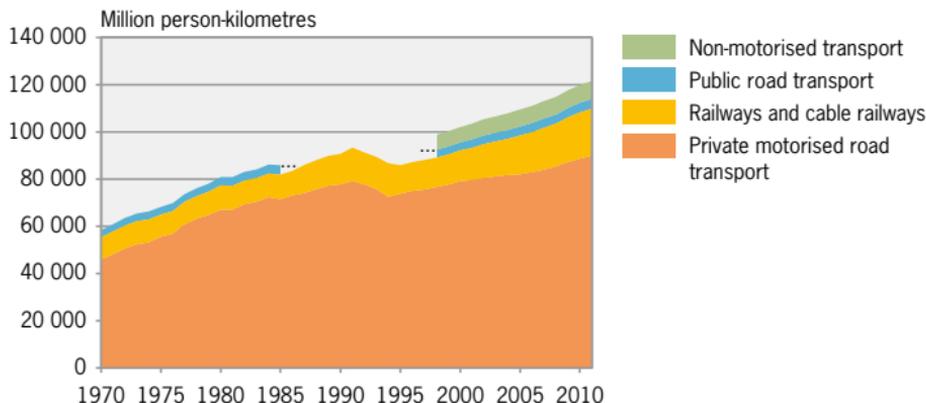
Three quarters of transport performance is covered by private motor vehicles

Transport performance by rail and road (incl. non-motorised traffic)	121.6 bn pkm	2011
Change	+19%	2000–2011
Share of public transport	20%	2011
Air passengers in scheduled and charter flights (local and transfer passengers)	44.4 m	2012

The sum of all the distances covered on road and rail by residents and foreigners in Switzerland was 122 billion person-kilometres in 2011 (including non-motorised traffic). This represents an increase of 19% compared to 2000. 74% of transport performance in 2011 was accounted for by private motorised transport, 20% by public transport and 6% by non-motorised transport (by foot and by bicycle).

In 2012, Swiss airports and regional airports registered a total of 44 million passengers in scheduled and charter flights (local and transfer passengers), 29% more than in 2000.

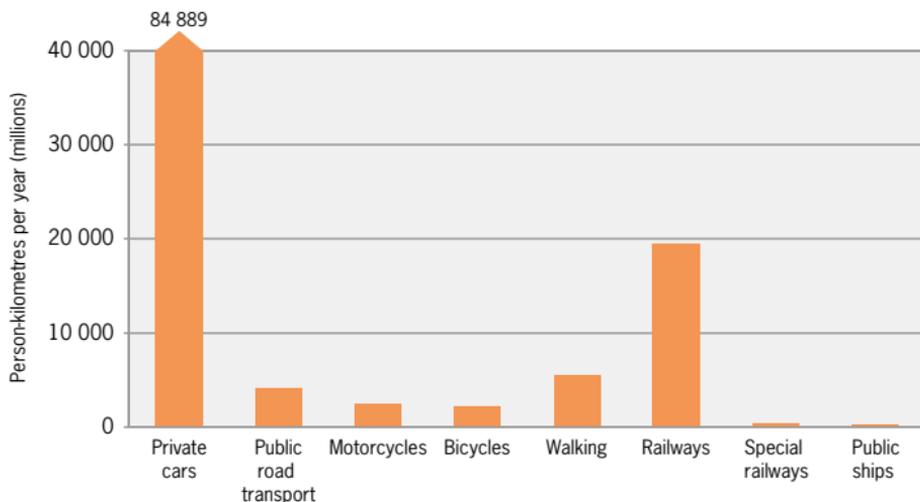
### Passenger transport performance



Source: Federal Statistical Office

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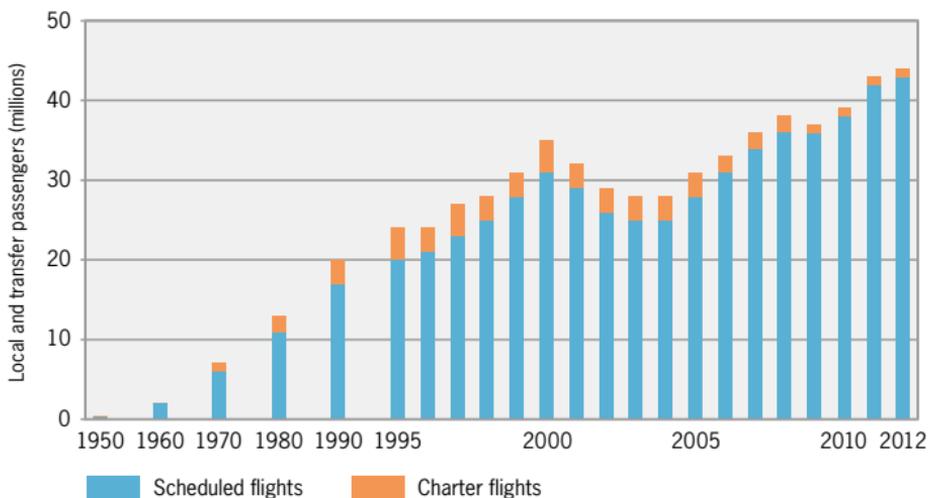
## Transport performance by means of transport in 2011



Source: Federal Statistical Office

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## Air passengers – scheduled and charter flights



Sources: Federal Statistical Office, Federal Office of Civil Aviation

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## Passenger traffic flows in 2011

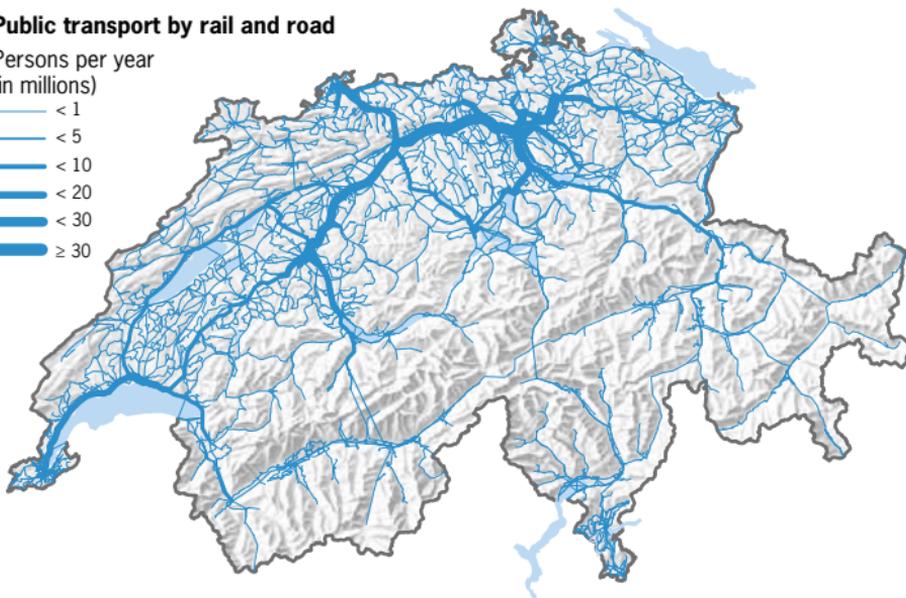
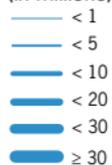
### Private motorised transport (cars)

Persons per year  
(in millions)



### Public transport by rail and road

Persons per year  
(in millions)



## 8 Travel behaviour of the population

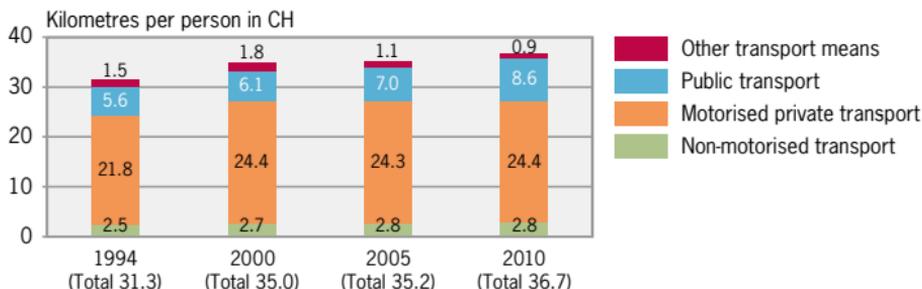
Half the distance around the world is covered per person every year

Average daily distance per person (in CH)	36.7 km	2010
Change	+5%	2000–2010
Share of motorised private transport	66%	2010
Share of leisure traffic	40%	2010
Average daily travel time (including waiting and transfer times)	91.7 min.	2010
Annual mobility per person (in CH and abroad)	20,500 km	2010

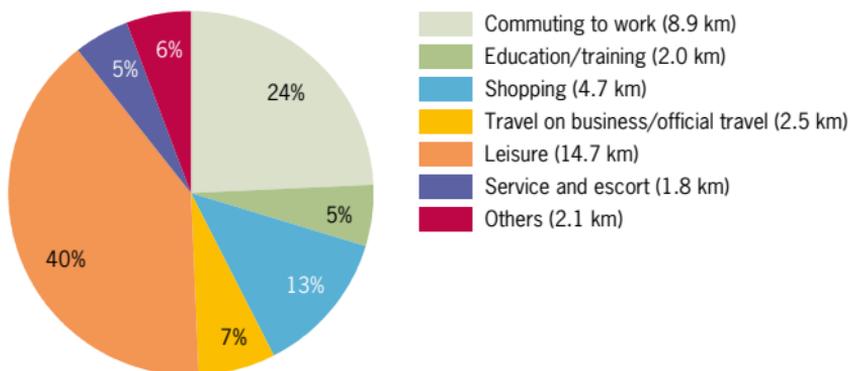
On average, each Swiss resident covered a daily distance of just under 37 km within Switzerland in 2010, 5% more than in 2000. The daily distances (66% in 2010) are largely covered by private motorised transport. Leisure activities account for the main trip purpose with 40% of distances, followed by commutes to work with 24%. In a comparison of population groups, men, young people aged between 18 and 24 and residents of rural communities cover the longest daily distances. Typically, one and a half hours every day are spent on travel.

On average, Swiss residents undertake 2.4 trips with overnight stays per person per year. After Switzerland, the most popular destinations are the neighbouring countries Germany, Italy and France. The total distance covered by a person resident in Switzerland during trips within Switzerland and abroad in 2010 added up to around 20,500 km on average. This is equivalent to half the distance around the world.

### Average daily distance by means of transport



## Average daily distance by means of transport in 2010

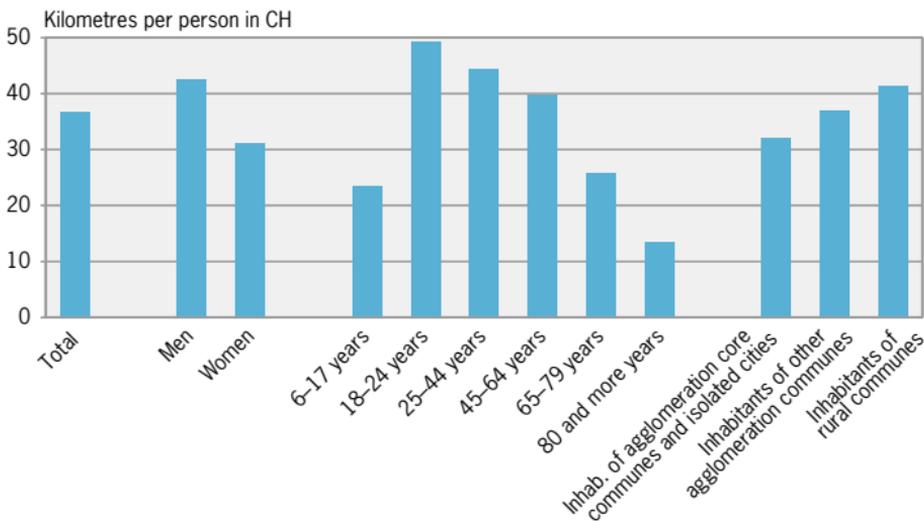


Total (Daily distance per capita in CH): 36.7 km

Sources: Federal Statistical Office, Federal Office for Spatial Development

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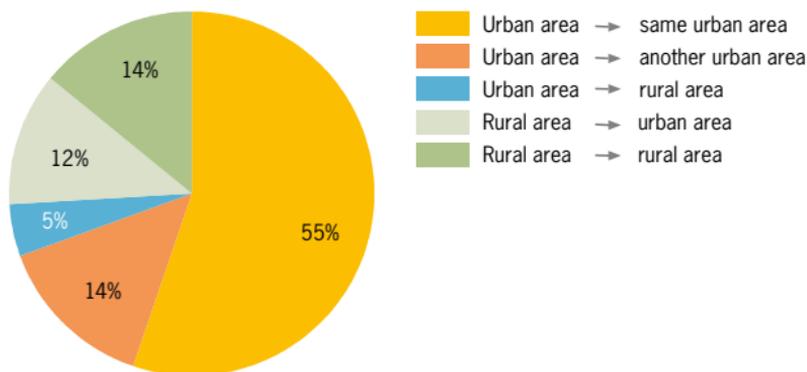
## Average daily distance by trip purpose in 2010



Sources: Federal Statistical Office, Federal Office for Spatial Development

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## Commuters according to starting and end point of their commute to work, in 2011<sup>1</sup>

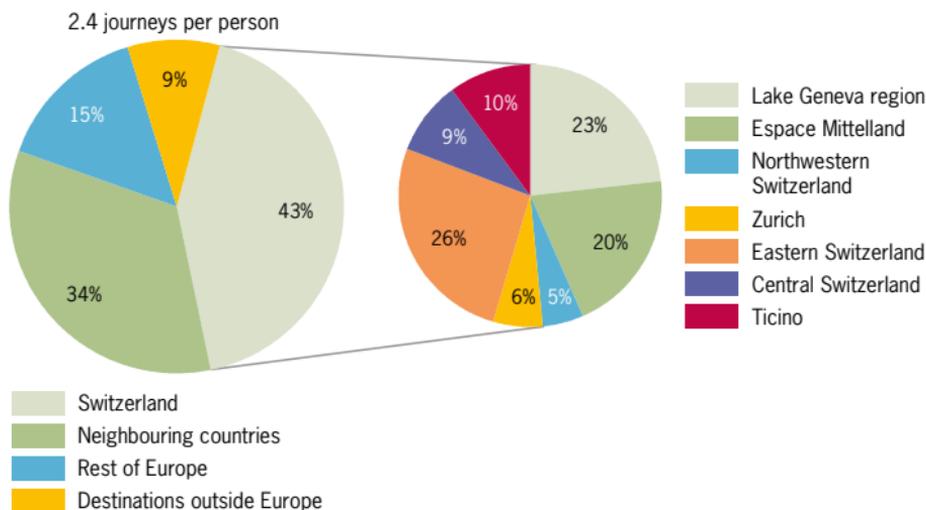


<sup>1</sup> The percentages were calculated based on a sample in which persons with missing commute data were not considered.

Source: Federal Statistical Office

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## Journeys with overnight stays according to destination in 2010



Sources: Federal Statistical Office, Federal Office for Spatial Development

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## 9 Goods transport performance

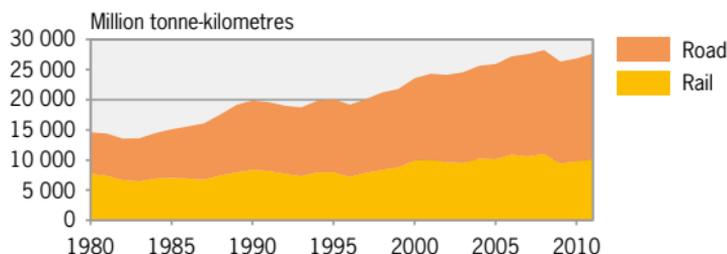
The share of goods transport by rail has considerably decreased since 1980

Goods transport performance	27.7 bn t-km	2011
Change	+90%	1980–2011
Rail transport share	37%	2011
Transalpine trips by heavy goods vehicles (through Switzerland)	1.21 m	2012
Change	+287%	1981–2012
Rail share of goods transport in transalpine goods transport (through Switzerland)	63%	2012

In 2011, the goods transport performance amounted to around 27.7 billion tonne-kilometres. The highest previously recorded value was 28.2 billion tonne-kilometres in 2008. Up to 2011, goods transport did not completely manage to recover from the decrease following the financial and economic crisis. If the entire period from 1980 to 2011 is considered, transport performance increased by 90%. The rail share of goods transport fell from 53% to 37%.

The number of transalpine trips through Switzerland by heavy goods vehicles increased fivefold between the opening of the Gotthard tunnel in 1981 and the year 2000. Since 2001, the values have decreased slightly. In 2012, a total of 37.5 million net tonnes of goods were transported by road and rail over Swiss alpine passes; 63% by rail. Its share in transalpine transport has decreased since 1981 but is still considerably greater than in Austria and France.

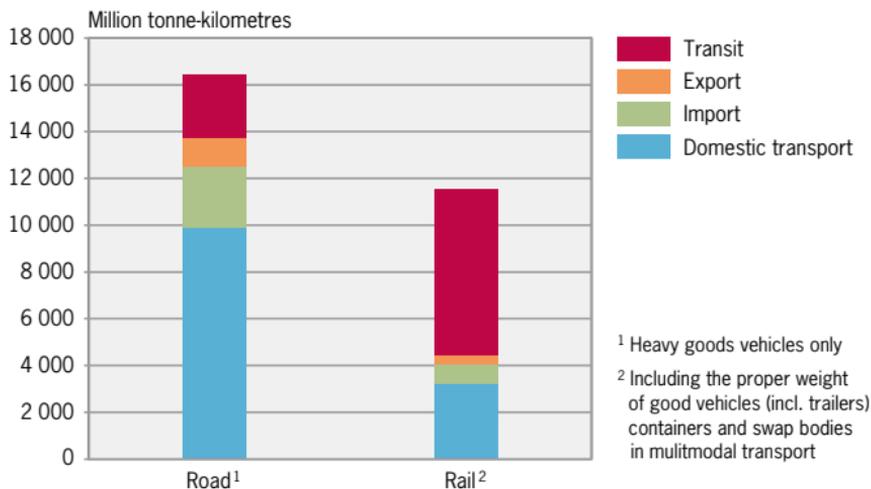
### Goods transport performance



Source: Federal Statistical Office

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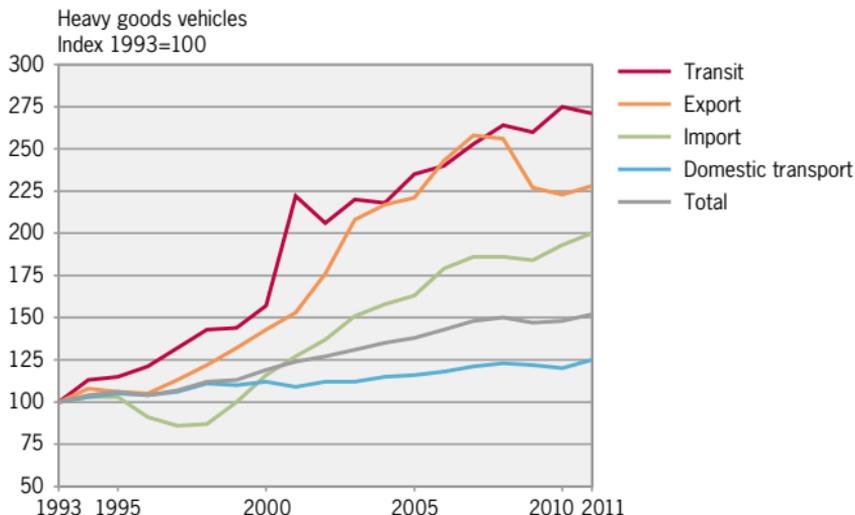
## Domestic and international transport performance by road and rail in 2011



Source: Federal Statistical Office

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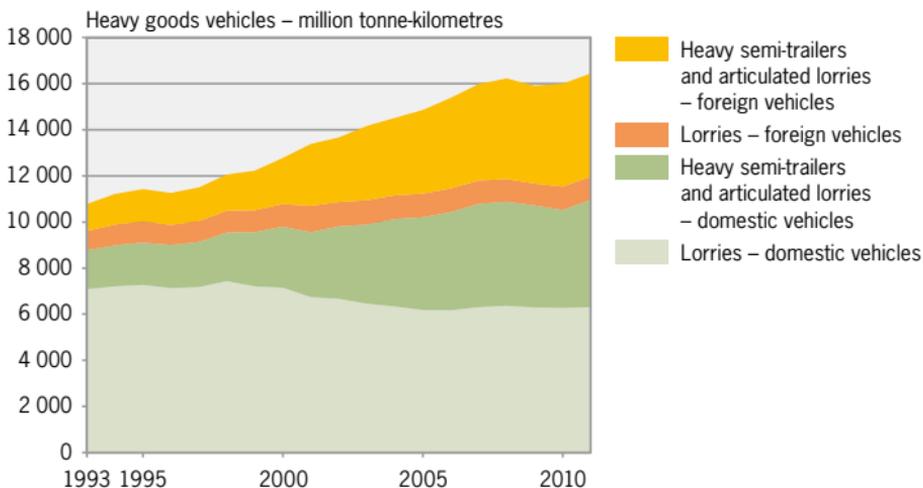
## Domestic and international transport performance by road



Source: Federal Statistical Office

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## Transport performance by road by vehicle type

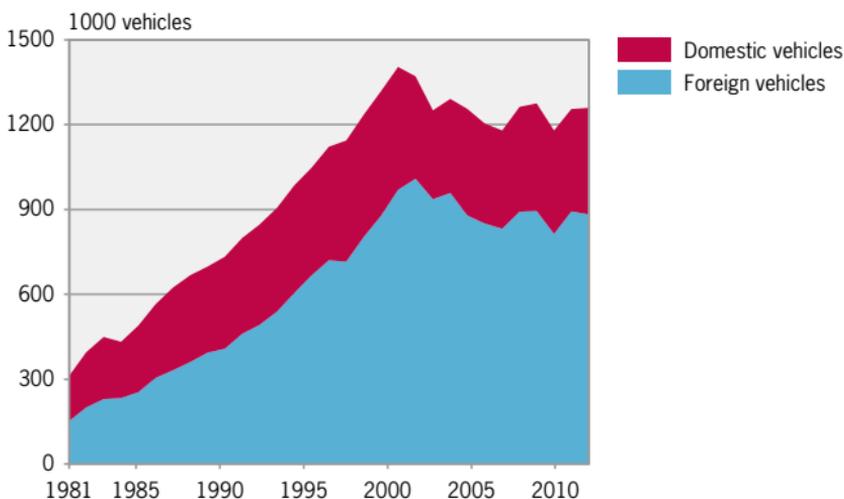


Source: Federal Statistical Office

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## Transalpine goods transport by road

(number of trips by heavy goods vehicles in Switzerland)

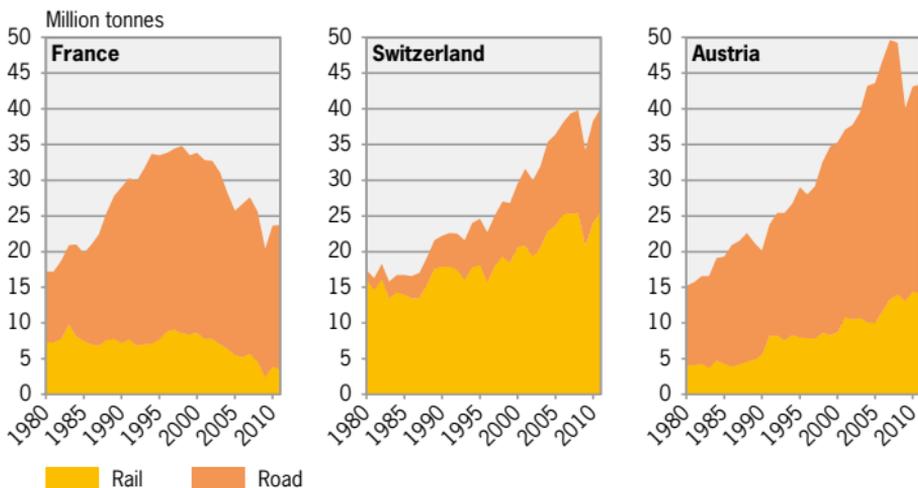


Sources: Federal Office of Transport, Federal Roads Office

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## Transalpine goods traffic volumes

(Mt. Cenis/Fréjus-Brenner alpine arc)

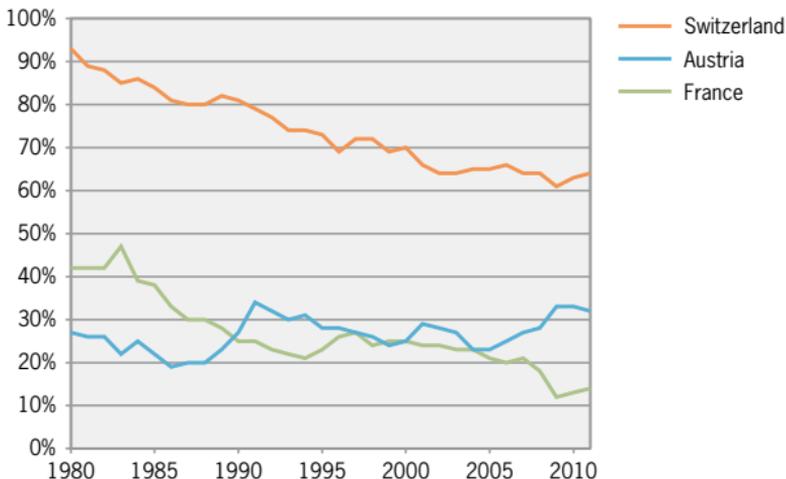


Source: Federal Office of Transport

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## Railway share of transalpine goods traffic

(Mt. Cenis/Fréjus-Brenner alpine arc, % basis: transported tonnage)



Source: Federal Office of Transport

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## Goods traffic flows in 2011

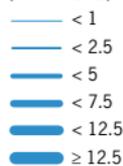
### Road

Tonnes per year  
(in millions)



### Rail

Tonnes per year  
(in millions)



## 10 Accidents

80% decrease in the number of people killed on the road since 1970

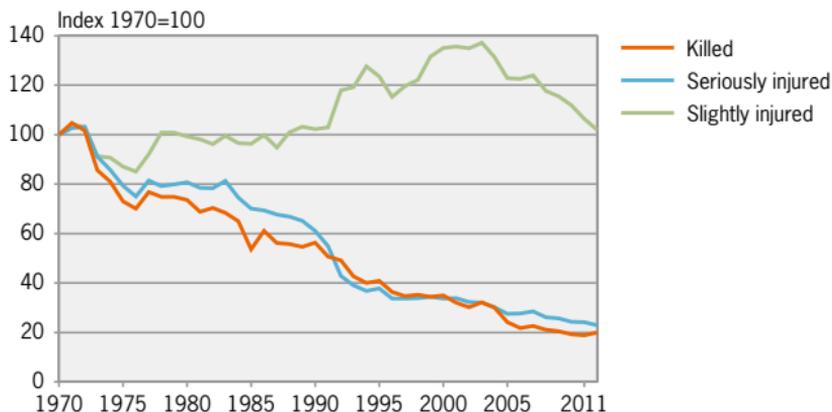
Road traffic		
Persons killed	339	2012
Persons seriously injured	4,202	2012
Persons slightly injured	18,016	2012
Rail traffic: Persons killed (excluding suicides)	28	2012
Air traffic: Persons killed in Switzerland	16	2012

339 people in total were killed on Swiss roads in 2012 – 80% less than in 1970. This downward trend is due to technical, legal and educational reasons. However, the coach accident in Sierre (VS) on 13 March 2012 led to an increase in the number of road deaths compared to the previous year.

Since 1970, the percentage of persons seriously injured in road traffic has fallen almost as much as that of people killed. Slight injuries in road traffic showed a different trend: Their number has also fallen since 2003, but had been rising for a long time before that year.

Accidents with killed and injured occur much more rarely in other transport modes. In the case of railways, they mainly involve persons trespassing on railway property.

### Victims of road accidents



## 11 Energy consumption and effects on environment

Transport consumes more energy than the household

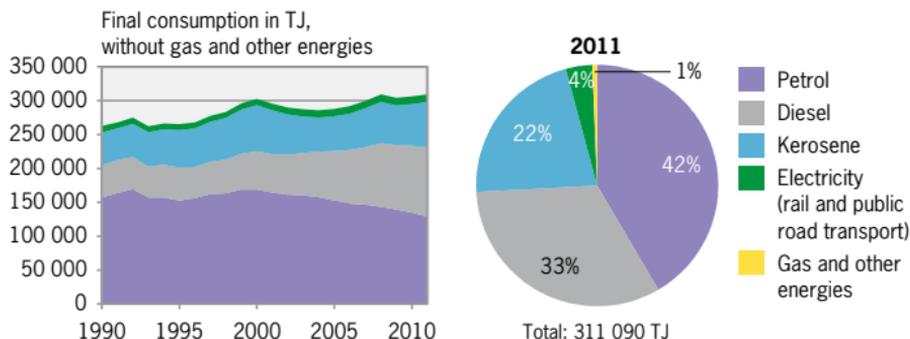
Transport's share of energy consumption (final consumption)	36%	2011
Transport's share of CO <sub>2</sub> emissions	38%	2011
Growth rate of transport's CO <sub>2</sub> emissions	12%	1990–2011

The benefit of mobility (Chapters 7 to 9) comes at the cost of undesirable effects. Apart from accidents, these also include the use of scarce energy resources as well as noise, air pollutants and greenhouse gases. Transport accounts for 36% of domestic energy sales. It is therefore the largest energy consumer group, ahead of the households and industry. As 96% of transport energy requirements are covered by petroleum products, its share of total petroleum consumption is as high as 65%.

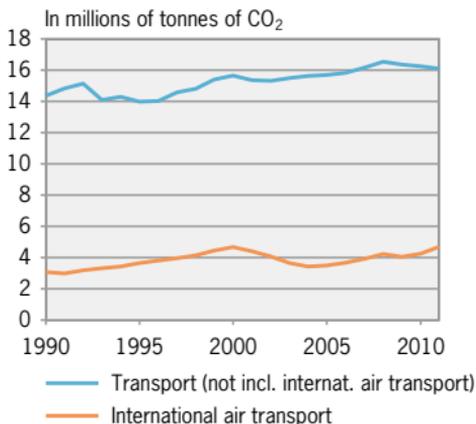
A large proportion of air pollution and the greenhouse gas carbon dioxide (CO<sub>2</sub>) comes from the road and air transport. Road transport is also the main source of nitrogen oxide (NO<sub>x</sub>), a precursor substance of low-level ozone and a contributory cause of acid rain. Road transport also releases large amounts of health-damaging particulate matter (PM10, see info box on the right).

Thanks to technological advances such as diesel-particulate filters and catalytic converters, air pollutant emissions caused by transport have been markedly reduced in recent years. However, the limit values set for nitrogen dioxide (NO<sub>2</sub>) and fine particulate matter are in some cases still being greatly exceeded.

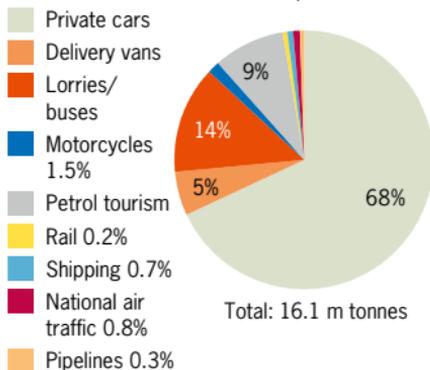
### Energy consumption from transport



## CO<sub>2</sub> emissions from transport



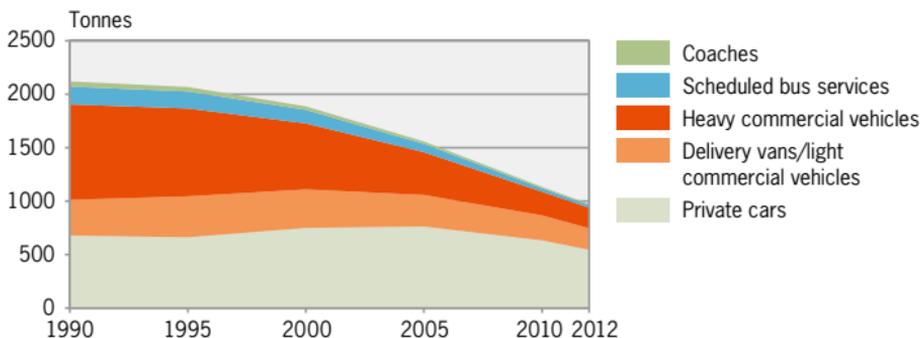
2011 (not incl. internat. air transport)



Source: Federal Office for the Environment

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## PM10 exhaust emissions from motorised road transport



Source: Federal Office for the Environment

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### Fine particulate matter (PM10)

Fine particulate matter (PM10) refers to particulates with a diameter of less than one 10000th of a millimetre. These can penetrate deep into the lungs and lead to respiratory and cardiovascular diseases. The carcinogenic components of emission from diesel engines are particularly harmful.

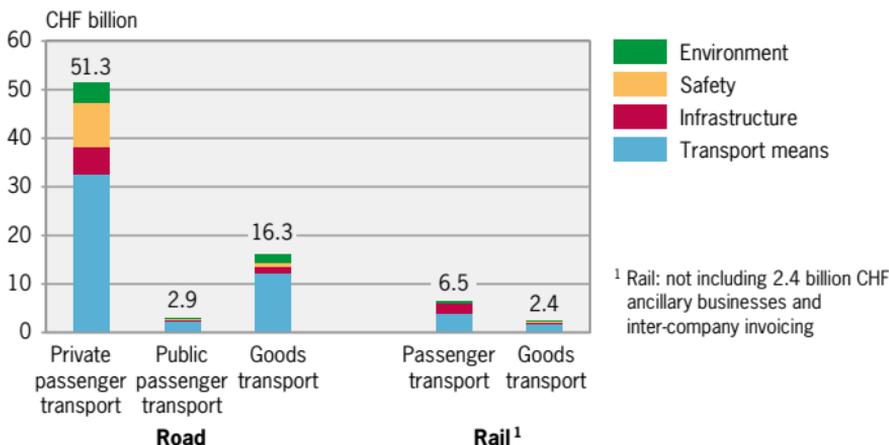
## 12 Costs

The costs of road transport are about six times that of rail transport

<b>Passenger transport</b>		
Costs of private road transport	CHF 51.3 bn	2005
Costs of public passenger transport	CHF 9 bn	2005
<b>Goods transport</b>		
Costs of goods transport by road	CHF 16.3 bn	2005
Costs of goods transport by rail	CHF 2 bn	2005

The economic costs of road and rail transport, that is the actual sums paid by causers, the state or third parties, as well as the non-monetary costs such as damage to the environment and noise, totalled CHF 82 billion in 2005. In comparison, the GDP then stood at CHF 479 billion. Thus, the costs of mobility exceeded those of, for example, health care or the public education system. Road transport accounted for about six times more than rail transport of the total mobility costs of CHF 82 billion. Over a tenth of the total costs were external costs that were borne by people other than the causers (see info box on the right). 90% of these costs were caused by road transport.

### Economic costs of traffic in 2005

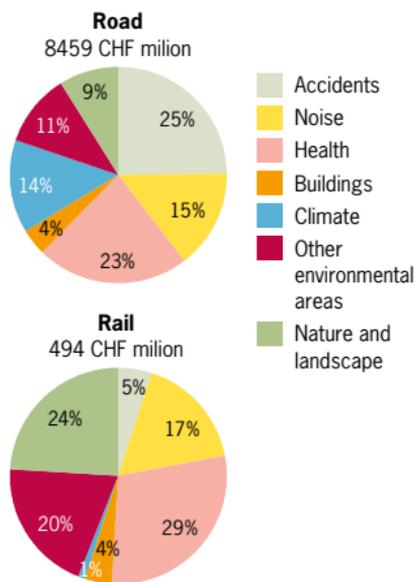
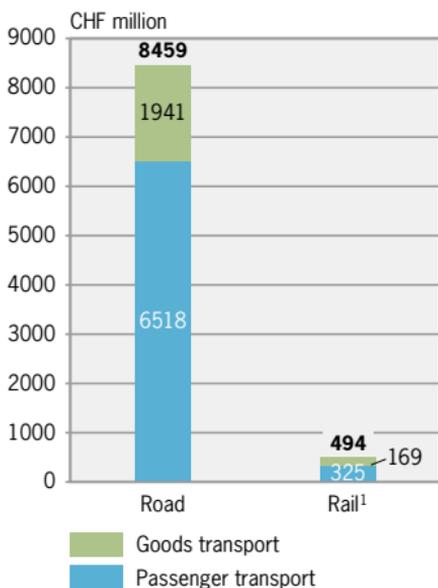




## External costs of transport

People choose their mode of transport on the basis of the cost they have to bear themselves (fuel, maintenance and depreciation of their own vehicles, the price of tickets and season tickets, payments to transport companies). However, the so-called external costs, which are borne by third parties (often the community as a whole), are not taken into account. These include in particular the consequential costs in the form of damage to the environment and health, as well as damage to buildings and loss in value. In passenger transport, travelling with one's own car causes many more external costs than travelling by public transport. The same applies to goods transport by road compared with rail. Most transport in Switzerland is by road. The result is transport structures which impose great burdens on the community and do not achieve an economic optimum.

### External costs of transport in 2009



<sup>1</sup> Passenger transport including third parties

## GLOSSARY

### **Daily distance**

Average distance travelled per person per day in Switzerland.

### **External costs**

Costs which are not borne by the causer but by other users or by the general public (inter alia: part of the costs of accidents, noise, airpollution etc.).

### **Goods transport performance**

Variable to describe performance in goods transport, which takes account both of weight of goods and the distance they are transported. The transport distance is expressed in tonne-kilometres, a tonne-kilometre referring to the transport of one tonne over one kilometre.

### **International economic interdependence**

Average value of imports and exports of goods and/or services as a percentage of GDP.

### **Kilometre performance**

Distance covered by vehicles within a specific period of time. Kilometre performance is specified in vehicle kilometres (veh.-km), train or timetable kilometres.

### **Local passengers**

An airport's local passengers start or end their flight at the relevant airport.

### **Means of transport group**

Inclusion of different means of transport in the categories of public, private and non-motorised traffic.

### **Modal split**

Distribution of transport service among various transport modes (e.g. road, rail).

### **Non-motorised traffic**

On foot, bicycle.

### **Person-kilometres**

Unit used to measure the transport performance where one passenger-kilometre is a kilometre travelled by one person.

### **Tonne-kilometres, tkm**

Unit used to measure the transport performance which refers to the transport of one tonne over one kilometre. This is calculated including the weight of the packaging directly surrounding the goods. Unless otherwise specified, the weight of the vehicle and transport containers is not considered.

### **Transport mode**

Infrastructure or the mediums by which means of transport move (road, rail, water, air). Transport modes are also used to group the means of transport.

### **Transport performance**

Total distance covered by persons in one year, measured in kilometres per person.

### **Transfer passengers**

An airport's transfer passengers are in transit and continue their journey with another flight. These passengers are counted twice, once on arrival and again on departure.

## Websites

Transport statistics (summaries)	<a href="http://www.transport-stat.admin.ch">www.transport-stat.admin.ch</a>
Transport policy (summaries)	<a href="http://www.are.admin.ch">www.are.admin.ch</a>
Roads	<a href="http://www.astra.admin.ch">www.astra.admin.ch</a> <a href="http://www.strasseschweiz.ch">www.strasseschweiz.ch</a>
Public transport	<a href="http://www.bav.admin.ch">www.bav.admin.ch</a> <a href="http://www.litra.ch">www.litra.ch</a>
Aviation	<a href="http://www.bazl.admin.ch">www.bazl.admin.ch</a>
Finances	<a href="http://www.efv.admin.ch">www.efv.admin.ch</a>
Accidents	<a href="http://www.unfalldaten.ch">www.unfalldaten.ch</a>
Energy	<a href="http://www.bfe.admin.ch">www.bfe.admin.ch</a>
Environment	<a href="http://www.bafu.admin.ch">www.bafu.admin.ch</a> <a href="http://www.environment-stat.admin.ch">www.environment-stat.admin.ch</a>

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