



## National Reporting to CSD 18/19 by Switzerland

# TRANSPORT

### 1. Overview

Sustainable transport means meeting the mobility needs of the country and providing appropriate access to individual districts, while reducing the associated harmful effects on humans and the environment. In recent decades there has been an overall improvement in the energy efficiency of transport in Switzerland.

That said, the tide has not turned to a sufficient degree where energy consumption and greenhouse gas emissions are concerned. There has also been little change to the modal split, i.e. how mobility is distributed across non motorised transport, individual motorised transport, and public transport. Despite considerable investment, public transport's share of individual mobility has stagnated at around 20% for some years now because road traffic infrastructures have been improved at the same time. Furthermore, traffic volumes continue to rise in step with gross domestic product, while freight traffic is growing even faster. Growth in the traffic volume gives rise to increased congestion on the most highly frequented stretches, especially in the major agglomerations.

Different measures were identified to enhance the situation. A Sectoral Transport Plan, adopted by the Federal Council in 2006, is targeting the coordinated development of the different modes of transport (public transport, individual motorised transport and non-motorised transport). Furthermore, an Infrastructure Fund ensures that transport infrastructures are financed in accordance with the planning requirements. The maintenance, modernisation, expansion and financing of the railway infrastructure to achieve the targeted shift of transalpine freight and passenger traffic on to the railways and public transport respectively, is another objective. Finally, targeted measures to achieve an increase in the proportion of total individual mobility accounted for by journeys on foot and by bicycle are on the way.

Another area of emphasis is modal shift. Market mechanisms can be defined to encourage the shift of transalpine freight traffic from the roads to the railways and to balance the external costs of transport.

### 2. Generic transport and mobility issues

In Switzerland, mobility is one of the biggest areas of energy consumption. At present, it accounts for around one third of end energy consumption, and the tendency is upward. It also accounts for the largest proportion (48%, including air transport) of CO<sub>2</sub> emissions.

By far the largest contributor has been road traffic. Over 95 % of the energy required is supplied by petroleum products. In 2005, the average distance travelled on land by each person resident in Switzerland was 15'700 km. The most popular means of transport was the car. In 2005, private cars were used for 76 % of the total distance travelled in Switzerland – including journeys by people resident abroad. Public transport accounted for 18 % and non motorised transport (cycling, walking) 6 %. Compared with 1995, there was only a slight shift in the modal split towards public transport. In 2005, leisure accounted for 45 % of the average daily distance travelled by the resident population. Whereas work related commuting accounted for less than a quarter of the total.

In 2005, 61 % of freight (in tonne-kilometers) was transported by road. Compared with 1990, the total volume of freight transport increased by 31 %, and over the same period the share of road transport rose by 3 %. Transport intensity (volume of freight transport per unit of GDP) increased. Between 1990 and 2007, transalpine freight transport volumes rose by 78 %, with the share of rail transport declining from 81 % to 64 %. The transfer goal of limiting the number of transalpine truck journeys to 650'000 per year has not yet been achieved. While 1.4 million trucks crossed the Alps in 2000, the total in 2007 was 1.26 million.

Air traffic has also increased sharply. Between 1990 and 2007, the number of movements recorded at the three national airports (Zurich, Geneva and Basel-Mulhouse) rose by 31 %.

#### *Outlook for freight traffic up to 2030*

According to scenarios drawn up by the Swiss Federal Office for Spatial Planning (ARE), the freight traffic on Switzerland's roads and railways could rise from today's 24 billion tonne-kilometres a year to between 31 and 42 billion tonne-kilometres (+32% to +78%) by 2030. Rail, in particular, will experience extremely dynamic growth in the future and will be able to expand its share of the market appreciably in the wake of a trend turnaround. Meanwhile, transit freight traffic will continue to gain in importance. These are the findings of the ARE's expert «Outlook for Swiss freight traffic up to 2030» report<sup>1</sup>.

#### *Transport related emissions*

In 2006, transport related emissions of carbon dioxide (CO<sub>2</sub>) amounted to 15.9 million tonnes, or 35 % of total CO<sub>2</sub> emissions in Switzerland. Having increased by more than 8 % between 1990 and 2000, CO<sub>2</sub> emissions from traffic have since remained at a fairly constant level. Road traffic is responsible for 97.2 % of transport-related CO<sub>2</sub> emissions (excluding international air traffic). Around 70 % of these emissions come from private cars. Between 1990 and 2006, as a result of advances in automotive technology, CO<sub>2</sub> emissions per person kilometer fell by 13 % in the private motorised transport sector. However, this improvement was offset by an increase in traffic volumes. In a comparison with EU-15

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<sup>1</sup> <http://www.aren.admin.ch/themen/verkehr/00256/00511/index.html?lang=en>

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countries, the transport fuel consumption of cars was found to be highest in Switzerland, at 8.84 l/100 km.

In the case of newly registered cars, Switzerland also fares poorly with regard to fuel consumption (7.43 l/100 km in 2007) and CO<sub>2</sub> emissions. Further reductions will be required not only for greenhouse gases but also for air pollutants – nitrogen oxides (NO<sub>x</sub>) and particulate matter (PM<sub>10</sub>) – in order to meet environmental targets.

### *Targets and policies*

The Federal Council has set different targets to enhance the situation in the transport sector (see also the “Sustainable Development Strategy: Guidelines and Action Plan 2008–2011” of the Federal Council<sup>2</sup>): the balanced development of the various individual regions within Switzerland must be ensured; transport infrastructure should meet mobility, cost, efficiency and public service requirements without adversely affecting the environment; the advantages offered by different modes of transport are to be exploited by promoting public transport, expanding non-motorised transport and shifting freight transport from road to rail; environmental impacts and energy consumption are to be reduced.

The Federal Council intends to meet these targets by setting points of emphasis in its ongoing policies, and by implementing existing instruments, specifically the Federal Act of 22 June 1979 on Spatial Planning, as well as transport infrastructure planning and financing instruments. It has also defined the following additional measures as part of its action plan:

### *Future proof transport infrastructure programme*

Coordinated targets are to be implemented for and between the different modes of transport (public transport, individual motorised transport and non motorised transport). These are to be supplemented with original approaches to transport related problems. One of the points of focus is to ensure that detailed planning for individual modes of transport pursues the objectives, principles and priorities laid down in the programme section of the Sectoral Transport Plan<sup>3</sup>, which is geared throughout to sustainable development. The programme section was adopted by the Federal Council in 2006.

Another area of emphasis, «infrastructure fund – financing infrastructure» ensures that transport infrastructures are financed in accordance with the planning requirements of the Infrastructure Fund, according to sustainability principles.

A third point, «strengthening public transport», will apply the maintenance, modernisation and expansion of the railway infrastructure, and the creation of suitable institutional structures, to achieve the targeted shift of traffic on to the railways and public transport respectively.

Meanwhile, «strengthening non-motorised transport» will introduce targeted measures to achieve an increase in the proportion of total individual mobility accounted for by journeys on foot, by bicycle, etc.

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<sup>2</sup> “Sustainable Development Strategy: Guidelines and Action Plan 2008–2011”:  
<http://www.are.admin.ch/themen/nachhaltig/00262/00528/index.html?lang=en>

<sup>3</sup> <http://www.are.admin.ch/themen/raumplanung/00240/01406/index.html?lang=de>

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### *Sustainable mobility programme*

The framework for a transport system that is geared to sustainable development must be developed further. Modal shift is an area of emphasis and is designed to apply market mechanisms to encourage the shift of transalpine freight traffic from the roads to the railways (e.g. by means of the new alpine crossing exchange, currently under development) and to balance the external costs of transport. Where air travel is concerned, the focus is on inclusion in an international emissions trading system. The Service Centre for Innovative and Sustainable Mobility<sup>4</sup> will support projects that develop and test new ideas for and marketable approaches to sustainable mobility. The following innovative examples show how this can be implemented:

- Transfer from road to rail: the heavy vehicle fee (HVF<sup>5</sup>) introduced in 2001, is levied on trucks with a total weight of more than 3.5 tonnes. The HVF resulted in a decrease in HGV traffic across the Alps (1.27 million trips in 2008 against 1.4 million in 2000) and the preservation of a high level of rail traffic.<sup>6</sup>
- To reduce CO<sub>2</sub> emissions from road traffic, fuels with a favourable life cycle assessment such as biogas, bioethanol and biodiesel have been exempted from mineral oil tax, and taxes on natural and liquefied petroleum gas have been lowered.
- Among the measures envisaged under the action plan on particulate matter (PM<sub>10</sub>) is the reimbursement of mineral oil tax to licensed transport companies that equip their diesel powered vehicles with particle filters.
- The “criteria for energy-efficient and low-emission vehicles” (KeeF), permitting an assessment of the environmental performance of cars, will provide a basis for further development of the existing energy label scheme. A new environmental label is to be introduced in 2010.

### *Leisure traffic*

Leisure traffic is responsible for 41% of all trips, 44.7% of the total distance covered and 51.5% of all time spent travelling. At federal level an interdependent package of various measures will be required to implement a sustainable leisure transport policy. It is for example necessary to pursue a reduction of individual motorized transport in favour of public transport and non motorised transport. Shorter trips could be also encouraged (by attractive destinations nearby, combined forms of mobility). It is also important to provide attractive, competitive and marketable ranges of leisure transport services. Incentives and attractive offers should be used and should take precedence over bans or obligatory measures. In this regard, the Confederation has an active role to play in a network of key players from cantons and towns/cities, and from associations, pressure groups and private industry.

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<sup>4</sup> <http://www.ave.admin.ch/dienstleistungen/00908/index.html?lang=de>

<sup>5</sup> <http://www.ave.admin.ch/themen/verkehr/00250/00461/index.html?lang=en>

<sup>6</sup> It has to be considered that in parallel with the introduction of the HVF the weight limit for trucks has been raised from 28 to 40 tonnes. Parts of the effects registered are due to this measure.

### *Implementation*

The Federal Department of the Environment, Transport, Energy and Communications (DETEC) is striving to achieve sustainable mobility. This requires a coordinated spatial development and transport policy. The individual transport organisations are to be deployed to implement the envisaged development according to their comparative advantages and are meaningfully linked together. The realisation of these goals requires both the expert knowledge of the individual transport offices and a cross disciplinary office which handles the overall transport aspect and the coordination function as well as contributing its expertise in the field of spatial development. The Federal Office for Spatial Development (ARE) has been tasked with performing the functions of the cross disciplinary office.

### **3. Fuel prices and tax reform**

The price of unleaded petrol increased continuously by 33 % between 1990 and 2008. The quantity of fuel consumed decreased from 2000 to 2004 but it is light increasing since 2005. In 2008 the quantity of fuel consumed increased from 3.2% in comparison with 2007.

In Switzerland the petroleum tax is an excise tax encompassing a petroleum tax on crude oil, other mineral oils, natural gas, their processed products, and engine fuels and a petroleum surtax on engine fuels. The revenue obtains with the petroleum tax in 2008 was 5.22 billion, francs or 8.17 % of federal revenue (of which 3.13 billion francs with the petroleum tax and 2.09 billion francs with the petroleum surtax). Half of the petroleum tax and the entire petroleum surtax are earmarked for tasks related to road traffic. The rest of the net revenue is allocated to general expenditures of the federal budget. The petroleum tax varies heavily depending on the product and the use of the product (engine fuel, heating fuel, technical purposes). For instance, the tax per litre is: 74.47 cents for unleaded petrol, 75.87 cents for diesel oil, 0.3 cents for extra light heating oil.

### *Climate cent<sup>7</sup>*

The "climate cent" tax is a voluntary measure of Swiss industry in place since 2005. With a 0.015 francs per litre charge on petrol and diesel imports, this tax generates around 100 million francs (\$98.9 million) for projects reducing carbon emissions. The funds are deployed both in Switzerland and abroad.

### *Infrastructure fund*

The infrastructure fund has been set up with the aim of managing growing mobility and the traffic problems that it means for Switzerland's agglomerations and motorway network and enabling main roads in mountain and peripheral regions to be maintained. The infrastructure fund is being drawn from a reorganisation of special financing for road traffic and will be financed with a portion of the tied revenues from the petroleum tax and the «vignette» badge that vehicles must display in order to use the Swiss motorway network, as well as the corresponding reserves.

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<sup>7</sup> <http://klimarappen.ch/en/home.html>

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Starting in 2008, the infrastructure fund for agglomeration traffic, the national motorway network and main roads in mountain and peripheral regions will provide 20.8 billion francs over 20 years for the following four areas:

- Completing the national motorway network: 8.5 billion francs
- Eliminating congestion hotspots in the existing motorway network: 5.5 billion francs
- Infrastructures for public and private transport in the agglomerations: 6 billion francs, of which 2.56 billion will be devoted to urgent projects and 3.44 billion to agglomeration programmes
- Maintaining the fabric of main roads in mountain and peripheral regions: 0.8 billion francs.

### *Tax exemption for biofuels*

As Switzerland is aware of the various environmental and social risks involved, it advocates a policy of limited, clearly defined support. It was the first country worldwide to introduce binding requirements concerning tax exemption for biofuels. To reduce CO<sub>2</sub> emissions from road traffic, fuels with a favourable life cycle assessment such as biogas, bioethanol and biodiesel have been exempted from mineral oil tax.

From cultivation of the crop to consumption of the fuel, emissions must be reduced by at least 40 % compared with petrol. Throughout their life cycle, biofuels must not cause significantly greater environmental impacts than fossil fuels. Particular attention is to be paid to air, soil and water pollution. The cultivation of biofuel crops must not endanger either the preservation of biodiversity or rainforests and other ecosystems that act as carbon sinks. Cultivation and production operations must comply with the labour legislation.

## **4. Regional and global transport system integration encouraging efficient modes**

As a country with a long tradition of transit, Switzerland wishes to take on its share of alpine transit traffic and in doing so, contribute significantly to the overall European domestic market. It insists, however, that the growing volume of traffic should be processed in the most environmentally sound way, primarily by rail. This particularly applies to transalpine transport. Transalpine road freight traffic has been expanding rapidly for many years now. This leads to traffic congestion at vulnerable points of Switzerland's road network and has harmful effects on people and the environment alike. In order to encourage more and more companies to shift their freight transport from road to rail, further action needs to be taken in parallel with existing schemes such as the heavy vehicle fee, subsidies for combined traffic, motorail services and the deregulation of rail freight traffic.

### *Gotthard is the most important crossing*

The Gotthard is by far the most important Swiss Alpine transit route. 972'000 of the total 1'274'000 heavy goods vehicles that crossed the Swiss Alps in 2008 used the Gotthard.

A total of 302'000 HGVs used the Great St Bernard, the Simplon and the San Bernardino combined. The Gotthard also comes first for rail traffic, ahead of the Simplon. The proportion

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of goods transported via the Lötschberg-Simplon route, however, continues to increase, a trend that will probably be even more pronounced after the opening of the Lötschberg rail tunnel in 2007.

### *Heavy vehicle fee*

From a Swiss perspective, it was of particular importance that the EU explicitly recognised the main goal of Swiss transport policy, the transfer of traffic from road to rail. The most important instrument for the implementation of this goal is the heavy vehicle fee (HVF), which the EU also explicitly recognised. It is levied throughout the whole country, i.e. not only on transit routes. Both domestic and foreign vehicles have to pay it. The charge thus corresponds to the principle of non discrimination.

In return, Switzerland committed itself to progressively increasing its weight limit from the then 28 tonnes to the EU level of 40 tonnes. It also confirmed an earlier commitment to expand its rail network for transalpine traffic, in particular to construct two base tunnels at the Lötschberg and at the Gotthard crossings.

### *The new transalpine tunnels*

The two new transalpine rail routes are the biggest ongoing rail projects, with base tunnels through the Gotthard (at 57 kilometers, this will be the longest tunnel in the world) and the Lötschberg (which opened in 2007). This new infrastructure raises transalpine rail links to a completely new level in terms of capacity and speed, thus making rail more competitive for both goods and passenger transport. The new tunnels mean that most of the growing volume of goods can be transported across the Alps by rail.

### *The rail reform*

It is also important that the railways do all they can to improve their productivity and competitiveness. Switzerland has therefore been progressively implementing rail reforms since 1999, thus also satisfying the relevant EU Directive. Since the Land Transport Agreement has come into force, a train path price has to be paid for free access to the network. As part of the rail reform, the debts of the Swiss Federal Railways (SBB) were largely cancelled and it became a limited company, which remains in the possession of the Confederation. The aim of the increasing competition between railway companies on transalpine rail freight axes is to improve the quality of rail freight transport and the offer of innovative services, in order to strengthen the railway's ability to compete with road.

### *The Federal law on the transfer of transalpine goods traffic to rail*

To supplement the measures mentioned above, the Swiss Federal Council and Parliament in 1999 adopted the Federal law on the transfer of transalpine goods traffic from road to rail, which includes accompanying measures.

These help to cushion the consequences of raising the weight limit to 40 tonnes. Additional funds to promote rail freight traffic form part of these accompanying measures.

Intermodal transport is the future market in the transport industry, and thus an important pillar in the modal shift policy, which is supported by the state. Part of the funds have been used to bring down slot prices and for the provision of additional intermodal services (including an efficient truck-on-train service between Freiburg/Germany and Novara/Italy).

### 5. Urban transport planning and policies

Spatial planning has so far failed to align transportation planning and urban development. The uncoordinated nature of the latter is further exacerbated by heavily decentralized institutional structures.

Urban transport planning is the responsibility of the municipalities concerned which pursue often differing or even conflicting individual interests. Appropriate action must be taken if urban development is to be structured along more sustainable lines in the future. In the interests of achieving balanced spatial development, the Federal Office for Spatial Development (ARE) has drawn up its «Spatial Development Report 2005». The following key points were settled specifically for the spatial development of transportation in urban areas:

- Urban development mainly in areas already easily accessible by public transport
- Denser development of quarters around railway stations
- Appropriate parking space management in towns and cities
- Promotion of non motorised transport.

The recording and assessment of the effects of new transport infrastructures is a central element in spatial planning and at the infrastructure project phase. However, in Switzerland to date, forecast effects have only rarely been compared with the actual spatial impact of infrastructure schemes. The «Spatial impact of transport infrastructures» project<sup>8</sup>, initiated by the Swiss Federal Office for Spatial Planning (ARE) and carried out in collaboration with the federal agencies concerned and interested cantons, is intended to help close this gap. The results were published in 2008 and provide essential feedback and allow reliable hypotheses for the success of current and future transport planning projects at all political levels – from local to national – to be formulated and verified.

### 6. Vehicle efficiency and emissions policies

Energy efficient mobility is an important stepping stone on the road to sustainable mobility.

#### *Intermodality*

By linking public transport in the best possible way with pedestrian and cycle traffic, as well as personal transport (carsharing, taxis, etc.) the entire transport system can be optimized. This approach unites the strengths of the various modes of transport. Creating the right framework for combined mobility is an important element in ensuring that mobility in general continues to develop in sustainable way.

Combined mobility cannot work without functioning chains of mobility. The points at which the different modes of transport intersect are of central importance. If the framework conditions for combined mobility are to be improved, transport and spatial development must be coordinated and all stakeholders must be included in the process. Mobility Centres are designed to make it easier for people to make use of combined mobility options and provide an attractive range of advice, information and access/ticketing services. They are to be found

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<sup>8</sup> <http://www.are.admin.ch/themen/raumplanung/00238/00424/index.html?lang=en>

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where public and private transportation intersect. Some pilot mobility centre projects are currently being supported and evaluated as part of the broad based «Mobility centres» project.

### *Swiss Energy Programme*

The main strength of this programme is aimed at promoting energy efficiency and the use of renewable energy. The main objectives of SwissEnergy in the area of mobility are as follows:

- Reduction of CO<sub>2</sub> emissions from new vehicles to 140 g/km by 2010 (same as EU targets), together with reduction of energy consumption and air pollutants (e.g. particulate matter from diesel engines).
- Increase of gas powered fleet to 30'000 vehicles, hybrid/electric car fleet to 20'000 vehicles, and electric bikes to 30'000 by 2010.
- To familiarise all new drivers with the main principles of EcoDrive®<sup>9</sup> by 2008.

To achieve these objectives, the focus has to be on two main areas:

- Technology: SwissEnergy supports innovative research and development projects, and coordinates public sector energy research in the area of mobility, especially concerning the development of light vehicles and new drive systems, e.g. for natural gas and biogas drives.
- Market: SwissEnergy promotes the distribution of energy efficient vehicles, primarily through the use of an energy label for motor cars. It also promotes energy efficient driving, and supports a variety of measures targeting energy efficient mobility and accompanying publicity campaigns.

### *Energy label for motor cars*

The Energy Ordinance stipulates that, with effect from March 2003, the energy label for motor cars has to be affixed in a clearly visible manner to every new vehicle offered for sale. The aim is to create transparency and encourage car buyers to opt for especially energy-efficient vehicles in the future. The energy label indicates fuel consumption (litres per 100 kilometres), CO<sub>2</sub> emissions (grams per kilometre), and relative consumption expressed by category (A to G). This information draws the attention of buyers more effectively to energy aspects, which are now also becoming increasingly attractive as a consequence of rising fuel prices.

The energy label will be replaced in 2010 by an environmental label which will take into account energy efficiency, energy consumption, CO<sub>2</sub> emissions and the environmental costs of operating the car.

### *Mobility management in companies*

Modern mobility management for companies is carried out in an area in which the mobility volume is especially high, namely business and commuter traffic. A variety of projects in

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<sup>9</sup> <http://www.bfe.admin.ch/energie/00576/00577/index.html?lang=en>

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collaboration with SwissEnergy focus on companies and municipalities that promote public transport and set out to encourage their employees or population to travel more effectively and energy efficiently.

### *Mobility management in municipalities*

Transport and mobility are permanent issues on the political and planning agendas of municipalities. These processes are often characterised by long, drawn out controversies, but by means of intelligent mobility management it is possible to improve the situation in municipalities while protecting the environment. With its "Mobility management in municipalities" programme, SwissEnergy offers municipalities professional assistance and financial support in defining suitable actions. It also places qualified mobility consultants at the disposal of municipalities.

### *Reduction of traffic pollutant emissions*

The continuous enforcement of the provisions on exhaust gases (NO<sub>x</sub>, HC, CO, PM<sub>10</sub>) and fuel quality (sulphur, lead) has proved by far the most efficient measure in reducing pollutant emissions. Nevertheless, this could be decreased much more significantly if the best available technologies were rigorously applied to new vehicles: particle filters for diesel powered vehicles, new propulsion technologies or alternative technologies.

### *Climate protection*

By ratifying the Kyoto Protocol, Switzerland committed to reducing its greenhouse gas emissions by 8 % until 2012 at the latest. The volume of CO<sub>2</sub> emissions from road traffic depends not only on the number of kilometers travelled but also on the vehicles' specific fuel consumption. The Swiss association of automobile importers and the Federal Department of the Environment, Transport, Energy and Communications (DETEC) have agreed an annual decrease of 3 % between 2000 and 2008 for this type of consumption. Although consumption has dropped for new vehicles for several years, the decrease remains below this value. Reasons for this include the fact that consumers are purchasing ever heavier and more powerful vehicles. Cantonal tax on motor vehicles is calculated on the basis of criteria determined, in principle, by fuel consumption. Thus, vehicles with good energy efficiency tend to be charged lower cantonal taxes. Several cantons grant a reduction or even exemption on the tax for motor vehicles to owners of "clean" vehicles with particularly good energy efficiency.

### *Noise reduction*

The main source of noise in Switzerland is traffic. Road traffic accounts for more than three quarters of all transport related exceedances of noise limits. Several measures have been adopted to reduce traffic noise at source, along the propagation path and in buildings; these are complemented by spatial planning measures. Further potential for noise abatement is offered by the development of quiet vehicles, low noise tyres and sound absorbing road surfaces.

### *Nature and landscape protection*

Roads, railway lines and fenced-off airports are responsible for habitat fragmentation, thus impairing ecological connectivity and contributing to the decline of many wildlife populations. Under the guidelines issued by the Federal Roads Office (FEDRO) in 2001 for the planning

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and construction of wildlife crossings on traffic routes, the restoration of wildlife corridors of national importance is a key priority.

When planning construction or transformation projects for large transport infrastructures, an environment impact assessment (EIA) must be performed to ensure that the environmental protection demands are met. The decision making authority expresses an opinion on the project and, if necessary, imposes new conditions so that such projects can be performed in an environmentally respectful manner. Roads, large car parks, railways and airports are subject to EIAs. Between 1990 and 2005, 548 reports connected with transport infrastructures were studied. In the last few years, monitoring of transport infrastructure construction sites has become a very useful tool for ensuring that the measures on environment protection are applied adequately and in conformity with current legislation.

### **6. Development of any transport technology research and development (public sector or private)**

The Swiss Energy Transports research programme examines criteria and measures for reducing energy consumption in the mobility sector, especially by the main segment, private motorised transport. The programme focuses on lighter and/or smaller vehicles, more efficient drive mechanisms and more suitable mobility behaviour.

The Accumulators / Supercapacitors research programme examines ways of improving electrochemical and electrostatic energy storage technologies. Here its focus is on Zebra batteries, super caps, lead accumulators and lithium ion and polymer batteries.

### **7. Road, rail and marine systems construction standards and changes in anticipation of climate change impacts (sea level rise, and increased frequency and severity of weather events)**

#### *Motorised transport*

The growth in traffic volume gives rise to increased congestion on the most highly frequented stretches, especially in the major agglomerations. In view of this, the sum of 5.5 billion francs is to be invested over the coming 20 years in measures to eliminate bottlenecks on the motorway network. The remaining 126.9 kilometres of motorway are expected to be completed within the next 15 years.

The total number of hours of traffic jams on Switzerland's motorways fell by 2.6 percent in 2008 versus 2007, despite a slight increase in the traffic volume. The total of 10'048 hours was the lowest recorded figure in seven years. Congestion was the main cause, followed by accidents and road works.

#### *Public transport, railways*

No country in the world provides such a dense and extensive public transport system as Switzerland. The Federal Office of Transport (FOT) works daily to maintain this efficient and high-quality service and to extend it further where necessary. The Confederation and the

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cantons thus commission and pay for the necessary services from approx. 500 state-licensed transport companies.

In addition, the FOT makes considerable financial contributions to the maintenance and extension of rail infrastructure in Switzerland. The Confederation annually invests about 5 billion Swiss francs in public transport in Switzerland. This is still not enough, however, to cover all the demands of the railways and of the cantons. So it is all the more important to deploy the available, limited resources in a targeted and economic way.

Large-scale projects to extend railway infrastructure include the two new transalpine rail routes through the Alps (NRLA), BAHN 2000, the acoustic treatment of rolling stock and track, and Switzerland's connection to the European high-speed rail network (TGV and ICE). Further, the two projects ZEB – “Future development of railway infrastructure” and "BAHN 2030" show that we are already planning for the decades to come. These projects will modernise Switzerland's rail infrastructure sustainably and tailor it to future requirements. Attractive regional public transport in the conurbations will be suited to travelers' needs and further reduce the volume of road traffic in congested urban areas.

### **8. Capacity building needs on transport activity assessment and analysis for integrated planning (e.g., urban transit, congestion relief, non-motorized transit, vehicle efficiency programs development, assessing fiscal incentives, inter-modal freight management systems)**

The Federal Office for Spatial Development is regularly drawing scenarios and forecasts for Swiss passenger and goods traffic. Current forecasts for goods traffic and for passenger traffic are already available<sup>10</sup>. If the key factors that influence traffic patterns change, so too will traffic itself. Scenarios can be used to illustrate these various potential shifts. Individual scenarios are used as the basis for forecasts that show us how the future might look if the major traffic determinants were to shift in a given direction.

The purposes of the forecasts are the following:

- gauge: the forecasts show underlying developments, distinct trends and the sensitivity of the transport system;
- measure of success: the forecasts set out the available scope for general transport policy programmes;
- basis for coordination: the forecasts offer all of the agencies that are involved in the transport sphere with a common and authoritative foundation of data.

In 2008, the automatic traffic counting stations operated by the Swiss Federal Roads Office recorded an average daily traffic volume on Switzerland's motorway network of almost 6 million motor vehicles. The network of automatic traffic counting stations now covers 183 stretches of motorway, and last year 137 of these delivered a full set of data.

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<sup>10</sup> <http://www.are.admin.ch/themen/verkehr/00256/00511/index.html?lang=en>

## 9. International development cooperation activities

### *Swiss Economic Development Cooperation*

Under the Economic Development Cooperation of the Swiss State Secretariat for Economic Affairs (SECO), a limited number of programs related to transport in the Swiss partner countries have been supported in recent years. SECO's relevant cooperation includes the refurbishment and transfer of trams from Swiss cities to partner cities in Serbia and Ukraine and the development of CDM methodologies for the transport sector under the Swiss contribution to the World Bank's Carbon Finance Assist trust fund.<sup>11</sup>

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<sup>11</sup> For more information, see: [www.seco-cooperation.ch](http://www.seco-cooperation.ch) and [www.cfassist.org](http://www.cfassist.org).