ROADS AND TRAFFIC
2019

Developments, facts and figures
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Cover photo
The 4.2-kilometre Eyholz tunnel in the canton of Valais is the only stretch of the motorway/national roads network that was completed in 2018.
Dear Reader,

Ensuring the safety of all road users is of the utmost importance to us. When we speak of traffic regulations, we are talking about road safety. When a stretch of motorway is renovated, the safety of road users as well as that of the roadwork site personnel is of the highest priority. When we address human-powered mobility, its integration into the road network and complex traffic situations is often based on safety aspects.

Safety is also a key issue for FEDRO in tunnels and on bridges on the motorway/national roads network. We do not accept any compromises.

We have achieved a high degree of road safety and are among the leaders in Europe in this regard. However, the increasing traffic volume is giving rise to major challenges to safety on roads in general. One of FEDRO’s duties is to keep traffic flowing as smoothly as possible and find ways to improve it on stretches where congestion still occurs. This, too, can make our roads safer. In this context, our traffic management centre in Emmenbrücke works closely together with the cantonal police forces and Viasuisse.

Safety measures also include protecting the network against natural hazards and identifying risks that need to be minimised. Risk management also opens up opportunities that benefit FEDRO and all road users. Last but not least, we promote research in the field of road traffic, including options for enhancing road safety. With a view to future developments, we are currently revising our research concept.

These are a few examples of issues you will find addressed in this year’s edition of “Roads & Traffic”, which underscores the diversity of our present-day and future activities. We look forward to the major tasks ahead that will encompass infrastructure, financing, vehicles and data management in the interest of road users. We hope you will find this annual report, which focuses on private mobility and the complex range of FEDRO’s activities, interesting and informative.

Jürg Röthlisberger  
Director of the Swiss Federal Roads Office (FEDRO)
Highlights of the year

27 June 2018
National transport plan
Adoption by the Federal Council of the road infrastructure segment of the national transport plan – a federal planning instrument that is constantly being updated. The aim here is to ensure that the long-term development of the motorway infrastructure can be coordinated with the defined spatial planning targets.

17 May 2018
Third report on public procurement
In 2017, FEDRO carried out 3,042 procurements totalling more than 1.4 billion Swiss francs, compared with 3,063 totalling 1.5 billion Swiss francs in the previous year. As in the past, in terms of value FEDRO based a large proportion of its procurements (79 percent of the total value) on competitive tenders, notably for services relating to planning and project development in the construction sector, management support for owners and developers, roadworks, signalling and IT services.

23 September 2018
Comprehensive network of cycle routes to reduce accidents
73.6 percent of voters accepted the proposed federal resolution on cycle routes. This was a direct counterproposal to the withdrawn “Velo-Initiative”. The federal government can now define the principles for cycle route networks, as well as support and coordinate measures on the part of the cantons, municipalities and other involved players.

30 November 2018
General project for the widening of the Bern/Wankdorf-Schönbühl stretch
Approval by the Federal Council of the general project for widening the stretch between Bern/Wankdorf and Schönbühl to six and eight lanes respectively. Costs: around 474 million Swiss francs. Work is scheduled to commence in 2027.

14 September 2018
Further development of the motorway network
Adoption by the Federal Council of the Strategic Motorway Development Programme (STEP). Up until 2030, the Federal Council aims to initiate expansion projects on the motorway/national roads network costing a total of around 14.8 billion Swiss francs. The aim here is to reduce congestion on the motorways and national roads.

10 October 2018
Measures for improving traffic flow
Proposal by the Federal Council to also introduce legal measures in order to improve traffic flow and enhance the level of road safety. These include introducing a legal obligation to form an emergency lane and regulations governing overtaking on the right on motorways. A corresponding consultation procedure was held.
1 January 2019

Requirement of medical examination as of the age of 75

Entry into effect of the raising of the age limit for medical examinations for drivers. According to the new regulation, holders of driving licences for cars and motorcycles will now only have to undergo a medical examination every two years after the age of 75. The previous age limit was 70.

7 March 2019

Designation of suppliers of charging stations at motorway rest areas

By providing charging stations at motorway rest areas, the federal government is making a contribution towards the availability of optimal recharging facilities for electric vehicles. The 100 rest areas are to be divided among five (out of a total of eight) bidders (private investors and operating companies).

18 December 2018

Mandatory accompaniment of L-drivers under the age of 20

With effect from 1 January 2021, people under the age of 20 who obtain a learner’s licence will have to complete a twelve-month learning phase. The advantage of this extension to the period of driving instruction is that the risk of accidents after learners have passed the practical driving test can be reduced if they have been accompanied on a greater number of journeys.

17 December 2018

Lorenzo Cascioni new Vice Director

Appointment of Lorenzo Cascioni (54) as new Vice Director. With effect from 1 May 2019 he will take over as head of the Road Traffic Division. He had previously been head of the Strategic Management Support section at the Federal Chancellery since 2006. His predecessor as Vice Director, Werner Jeger, is to take over as Road Safety Officer.

17 December 2018

Common road map for the promotion of electric mobility

At the invitation of Federal Councillor Doris Leuthard, representatives of the automotive, electricity, real estate and vehicle fleet segments and their respective industry associations, together with representatives of the federal government, cantons and municipalities, signed a declaration aimed at promoting electric mobility. The aim behind this move is to increase the proportion of registered electric vehicles to 15 percent by 2022.

1 January 2019

New head of DETEC

Change of leadership at the Federal Department of the Environment, Transport, Energy and Communications (DETEC). The new head of DETEC (and thus of FEDRO) is Simonetta Sommaruga. She takes over from Federal Councillor Doris Leuthard, who had been head of DETEC since 2010.

1 February 2019

Discontinuation of specification of “automatic transmission” in driving licences

As of 1 February 2019, anyone who passes the practical driving test in a vehicle with automatic transmission is also permitted to drive vehicles with manual transmission. The specification of “automatic transmission” will no longer be entered in driving licences. Holders of driving licences issued prior to the above date may ask the relevant road traffic authority to delete this restriction.

1 April 2019
Statistically speaking, the tunnels on the motorway/national roads network are safer than the open stretches. If an incident occurs inside a tunnel, however, road users have to be able to escape to a safe zone as quickly as possible. FEDRO is continually working to improve escape routes as well as ventilation, traffic signs and energy supply in tunnels.

As the figures for 2018 show, there were 54,000 accidents on Switzerland’s roads, 7,800 of which occurred on the motorways/national roads and “only” a very small number in tunnels. Thus, the level of tunnel safety on the motorway/national roads network is very high. There are various reasons why this is the case: in tunnels the speed limit is lower, in many tunnels heavy goods vehicles are prohibited from overtaking, lighting is on permanently and the lanes are not affected by rainfall or ice formation. On the other hand, both the construction and operating costs of tunnels are many times higher than those for open stretches and bridges.

If there is a fire in a tunnel, road users are exposed to the risk of smoke developing. Major fires in the past, for example in the Gotthard road tunnel in 2001, prompted efforts to improve guidelines and standards relating to tunnel safety. FEDRO produced directives concerning motorway tunnel safety requirements, together with other regulations and guidelines, for example governing ventilation in tunnels. In addition, it also adapted SIA Standard 197/2, which applies to the planning of road tunnels.

1.55 billion Swiss francs for tunnel safety up to 2025
Commencing in 2010, the level of safety with respect to escape routes, ventilation, signalling of safety installations and redundant energy supply in the 252 tunnels on the motorway/national roads network was examined and where necessary improved. The majority of tunnels now meet the specified criteria: escape routes, 83 percent; ventilation, 86 percent; signalling of safety installations, 94 percent; energy supply, 93 percent. According to the tunnel safety implementation programme, all tunnels on the motorway/national roads network have to meet the new requirements by 2025. The status of implementation is updated annually in the interim programme reports and posted on the Internet. The costs for improving tunnel safety will amount to approximately 1.55 billion Swiss francs. A billion Swiss francs were already invested in the period from 2010 to 2018.
Tunnels on the motorways and national roads are equipped with comprehensive operating and safety installations, plus indicated emergency exits. The aim here is to ensure safe passage during normal operation and rapid escape in the event of an incident.

Emergency exits, which lead from the main tunnel to safety zones and thus permit rapid escape, are a major factor for tunnel safety. According to the relevant specification, emergency exits in twin-tube tunnels (i.e. with one-way traffic) must be installed every 300 metres. In single-tube tunnels (i.e. with two-way traffic), the specified interval can be between 150 and 500 metres, depending on the longitudinal gradient.

Emergency exits must be indicated with luminous green signs, which display flashing lights in the event of an incident. The emergency exit from the main tunnel normally leads to an escape shaft and on to the exterior of the tunnel or the neighbouring tube, and thus to a safety zone.

Smoke extraction
The ventilation directive (FEDRO 13001) stipulates which type of ventilation system has to be installed in a given tunnel. In the event of a fire, the ventilation system has to keep the area affected by smoke as short as possible in order to protect people in the tunnel from exposure to smoke and toxic gases. Tunnels longer than 1 kilometre have to be equipped with a ventilation system with smoke extraction so that concentrations of toxic fumes can be swiftly removed from the tunnel.

Energy supply and lighting
Tunnels on the motorways and national roads are supplied with electricity redundantly by two separate providers. If a power failure should nonetheless occur, a battery-powered emergency supply is available for one hour for the most important installations. This means, for example, that lighting in the escape routes remains available during the initial state of the emergency.

Tunnels are equipped with dimmable overhead lighting. During bright daylight conditions, the lighting is switched on at the portals. This enables drivers’ eyes to adjust to the light conditions inside the tunnel, where the lighting is weaker than at the entrance to the tunnel.
Tunnel safety

Tunnel cleaning to enhance safety

As part of the operational maintenance programme, motorway/national road tunnels are cleaned twice a year. This improves the visibility of the various safety elements and simultaneously enhances operational safety, helps preserve the structural substance and gives the tunnel a cared-for appearance.

The operation of the motorways/national roads is secured by eleven regional offices, as a rule cantonal civil engineering departments, which act on behalf of FEDRO on the basis of service level agreements. Cleaning the motorways/national roads costs around 50 million Swiss francs a year, with tunnels accounting for 15 million. The major tunnel cleaning programme is carried out each year during the spring. Pre-scheduled night-time closures are used for this purpose, during which other maintenance work is carried out. Where necessary, a second, less comprehensive tunnel cleaning programme is carried out in the autumn.

Environmental protection regulations

The nature of the tunnel cleaning operations is defined and specified in FEDRO directive 16220, which regulates the cleaning of the operating and safety installations, the washing of the walls in order to enhance visibility and give the tunnel a well-cared-for appearance, and the cleaning of the drainage facilities.

During the cleaning process, care is taken to assure compliance with the applicable provisions governing the protection of the environment and bodies of water. Only cleaning agents that meet the relevant legal provisions may be used. Due to material that is lost during transport (for example, straw or gravel that ends up in the shafts and pipelines), the cleaning of drainage systems is particularly work-intensive. During periods of hot, dry weather, the dried-up siphons also have to be replenished with water in order to prevent the potential spread of burning hazardous liquids into the drain pipe system.

Cleaning of the walls in the Murgwald tunnel on the A3 along the Walensee lake in the canton of St Gallen.
Inspection work in the Turtmann tunnel on the A9 in the canton of Valais.

**Night-time closures for periodical tunnel inspections**

One of the reasons for monitoring tunnel structures is to track their condition and take any measures that may be necessary. Full and interim inspections are carried out alongside control measurements and function checks. In addition, permanent observations and special inspections have to be carried out.

The main purposes of tunnel inspections are to visually check the condition of the structure, carry out the controls specified in the monitoring plan and assess the overall condition of the tunnel. By periodically carrying out careful inspections it is possible to detect any changes in the structural substance that may have occurred. In order to ensure that access to the motorways/national roads remains available with as little restriction as possible, most inspections are carried out during night-time closures.

**Defined planning procedure**

Full inspections are carried out every five years, as a rule by a mandated engineering bureau. These are implemented in accordance with a clearly defined, standardised plan that is conceived so that the results of the respective inspections can be compared with one another. In this way, any increase in damage can be readily identified.

A full inspection enables specialists to assess the condition of the structural substance. The inspectors assess the structure as a whole, as well as each component in detail. The components are classified into status categories 1 to 5 (cf. pp. 10–11), and the findings are documented in a report on the full inspection. Any identified damage is recorded in a damage plan, which FEDRO uses as the basis for introducing any necessary measures and initiating renovation projects.

Interim inspections are carried out annually by the responsible regional office and serve the purpose of detecting deviations from the required status. Control measurements are carried out in accordance with the monitoring and maintenance schedule.

Targeted observation is a permanent task that is carried out by the regional offices within the scope of their operational duties. It includes following up on observations communicated by third parties.

Special inspections are only required if a change in status is observed but cannot be precisely classified.
Bridge safety

30 million Swiss francs a year for inspections of the motorway/national roads network

Road bridges are complex structures. They are exposed to environmental influences such as water, temperature fluctuations and wind, as well as damage caused through the use of salt in winter. Periodical inspections are therefore an integral part of the maintenance programmes of road owners. FEDRO invests around 30 million Swiss francs a year for inspections of the infrastructure on the motorway/national roads network.

It is the duty of FEDRO to ensure the safety of road users, as well as to guarantee the availability of the motorway/national roads network. Bridges are exposed to particular wear and tear from heavy traffic loads and various environmental influences in the ageing process and therefore need to undergo periodical inspections. The results of these status assessments form the basis for the planning of any measures that may be required. The growing volume of traffic, heavier loads and new technological developments may lead to steps being taken to reinforce road bridges.

Status assessments and follow-up static tests are carried out in accordance with SIA Standard 269 (Maintenance of Engineering Structures), which describes the required general examination, visual controls and inspections. It also sets out the specifications for detailed examinations, in-depth investigations, laboratory tests and subsequent computational verification.

Inspections every five years

In the same way as for tunnels, bridges on the motorway/national roads network have to be inspected every five years by specialised engineers. The inspections are carried out on the basis of uniform criteria. FEDRO carries out a detailed status assessment and examination every ten years. It verifies the quality of the inspections and the completeness of the inventory both internally and through an external bureau. Closures of bridges for inspection purposes are rarely required.

As of 2017, there were 9,366 engineering structures on the motorway/national roads network. The replacement value of these structures is 23.28 billion Swiss francs.

www.astra.admin.ch/network-status

| Condition of engineering structures in 2017* |
|---|---|---|---|
|   |   |   |   |
| 1 | 26 % | Good | No or only minor damage. |
| 2 | 63 % | Satisfactory | Insignificant damage, no impacts in terms of safety and performance, but potential to develop into category 3. |
| 3 | 10 % | Sufficient | Moderately severe damage, no impacts in terms of safety; needs to be closely monitored. |
| 4 | 1 % | Critical | Severe damage, no impact in terms of stability or traffic safety; needs attention in the medium term. |
| 5 | 0 % | Poor | Urgent measures required, for example replacement of transition joints or individual elements, installation of temporary support structures, imposition of weight restrictions. |

* Engineering structures include bridges, tunnels, covered stretches, wildlife corridors, retaining walls
Concrete and protection against corrosion

As a rule, bridges on the motorway/national roads network are constructed of concrete. For their durability, protection against corrosion is of the utmost importance. Negative influences include surface moisture, water flow and salt water ingress. Special attention has to be paid to these aspects when assessing a bridge’s condition.

The high density and chemical composition of concrete protects the steel reinforcements. This protective capacity is weakened by the formation of cracks, chemical reactions with CO₂ and the ingress of salt water, creating potential for the internal steel reinforcements to rust. Visual inspections therefore have to especially focus on the following aspects:

– seals, transition joints and drainage facilities
– signs of erosion
– formation of fissures on the concrete components
– existing erosion of the reinforcements, cracks and spallings in the concrete, exposed steel reinforcements
– deformations

Excessive fissure formation can be a sign of overstrain. In the case of steel and composite (steel and concrete) bridges, the protection of the steel structure against corrosion has to be inspected. For a detailed condition assessment, the following types of damage have to be quantified:

– CO₂ influencing factors
– salt penetration
– status of the concrete’s chemical composition
– microscopic examination of the concrete
– widespread corrosion detection
– measurement monitoring
– structural analysis of the bridge

To quantify the condition of a bridge, drilling samples, calculation of pH levels, geo-radar examinations and potential field measurements have to be carried out. In addition, the uppermost concrete layer has to be exposed down to the reinforcement bars. In the case of composite (steel and concrete), steel, oblique and suspension bridges, more intensive examinations (x-ray, ultrasound, magnetic induction) may be required.

The costs for visual inspection are fairly moderate, but they are correspondingly higher if more detailed assessments are required. FEDRO carefully plans the deployment of financial resources by weighing up the costs of status assessments against the costs of comprehensive renovation.

Statistics: Condition of engineering structures on the entire motorway/national roads network (1,858.9 kilometres)

<table>
<thead>
<tr>
<th>Status category</th>
<th>Engineering structures and tunnels</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2,503</td>
</tr>
<tr>
<td>2</td>
<td>6,006</td>
</tr>
<tr>
<td>3</td>
<td>923</td>
</tr>
<tr>
<td>4</td>
<td>133</td>
</tr>
<tr>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>9,569</strong></td>
</tr>
</tbody>
</table>
Ripshausen is one of six heavy vehicle inspection centres in Switzerland. It was opened in 2009 as the fourth centre after Unterreala (2004), Schaffhausen (2007) and Ostermundigen (2008). The St Maurice and Mesolcina inspection centres were completed in 2012 and 2018 respectively. Ripshausen is situated directly on the Gotthard axis, along which around 780,000 HGVs travel each year. The Gotthard is the most important north-south route for HGVs; Ripshausen is thus by far the largest inspection centre in the country. Heavy vehicle inspections form an integral part of Switzerland’s road transport safety concept. At Ripshausen, inspections are carried out in order to ensure that heavy vehicles entering the Gotthard road tunnel are in roadworthy condition so that the roads can be kept as safe as possible. The construction of Ripshausen heavy vehicle inspection centre cost 70 million Swiss francs. The centre currently employs around 50 personnel. Its annual operating costs are 6 million Swiss francs. The centre comprises three covered inspection lanes plus a testing facility. It is similar to the vehicle testing centre of a cantonal road traffic authority and is equipped with automatic vehicle data detection and offices, plus lounges for drivers.

In 2018, 15,558 vehicles (HGVs, buses, delivery vehicles) were diverted from the motorway for inspection. Irregularities were detected in 5,830 vehicles, and 2,483 of these had to be temporarily detained at the centre. The inspections also examine the condition of the drivers as well as their compliance with the specified working hours and rest periods. Vehicle inspections focus on technical aspects: faulty brakes, tyres and chassis are the most commonly detected shortcomings, and in most cases these have to be remedied before the vehicle is allowed to proceed. The inspectors also check vehicle loads and whether they are correctly secured. When a vehicle enters the centre it drives past an automated measurement and weighing facility. This means that its data have already been recorded when it enters the inspection lane. If there are no detected shortcomings, the inspection takes between ten and twenty minutes; but, if problems are detected, the vehicle may have to be detained for several days. The waiting area, which can accommodate 495 HGVs, also fulfils an important function if there are too many vehicles on the approach to the Gotthard road tunnel.

28,683 vehicles inspected in 2018
There are six heavy vehicle inspection centres in Switzerland: Schaffhausen, Unterreala (Grisons), Ripshausen (Uri), Ostermundigen (Bern), St-Maurice (Valais) and Mesolcina (Grisons). In 2018, a total of 28,683 vehicles were inspected at these centres (see table). 9,786 irregularities were detected, and 3,138 vehicles were prohibited from continuing their journey. Police forces also carry out random roadside inspections. In 2018, out of a total of 61,776 inspections, 10,492 irregularities were detected, and 2,052 vehicles were prohibited from continuing their journey.

| No. of inspected vehicles (HGVs, semi-trailers, delivery vehicles, buses) |
|-----------------------------|----------------|----------------|----------------|----------------|----------------|
|                             | 2014           | 2015           | 2016           | 2017           | 2018           |
| **Whole of Switzerland**    |                |                |                |                |                |
| Inspection centres          | 27,554         | 30,085         | 30,048         | 27,790         | 28,683         |
| Of which buses              | 437            | 494            | 496            | 534            | 516            |
| Vehicles with irregularities| 9,631          | 10,119         | 9,464          | 9,596          | 9,786          |
| Vehicles detained           | 2,486          | 2,780          | 3,127          | 3,145          | 3,138          |
| Roadside inspections        | 66,711         | 66,320         | 67,828         | 65,849         | 61,776         |
| Of which buses              | 1,685          | 1,848          | 2,155          | 1,934          | 1,852          |
| Vehicles with irregularities| 12,214         | 12,150         | 12,377         | 10,815         | 10,492         |
| Vehicles detained           | 3,133          | 2,944          | 2,734          | 2,347          | 2,052          |
Ripshausen/Erstfeld heavy vehicle inspection centre (canton of Uri). 1) Holding zone for feeding HGVs into the Gotthard road tunnel. 2) Insufficiently secured load. 3) The three inspection lanes. 4) Vehicle data are recorded automatically.
FEDRO is reorienting the organisation and content of its research in the roads sector. Five workgroups are developing the specified thematic priorities. The aim is to attach greater importance to road research. The new concept is to be introduced in 2020.

FEDRO’s duties and objectives are clearly defined: to constantly improve the technical quality of the country’s roads and guarantee their availability, to keep traffic flowing as smoothly as possible and to enhance the safety of our roads for all users.

The aim of the research is to directly implement findings and incorporate them into road transport policy. To secure the long-term benefits of its research, FEDRO is currently reorienting its overall concept.

FEDRO wants greater attention to be paid to its strategic areas of focus and the quality of its research projects to be further improved.

Workgroups instead of fields of research
The existing fields of research are to be replaced by the following five workgroups:
– Engineering structures, tunnels, geotechnology
– Transport routes and the environment
– Traffic planning and technology
– Mobility 4.0
– People and vehicles

This reorganisation ensures that all the relevant fields of research for FEDRO will be covered. In addition, a research commission is to be created which will support the FEDRO research management team with the specification of its strategic orientation. The commission will ensure that the various requirements of FEDRO relating to the development of the new research concept will be fully taken into account.

wwwARAMIS.admin.ch

Research projects also focus on the concrete used in engineering structures: Graity tunnel on the “Transjurane” motorway in north-west Switzerland.
Research is also required for the development of high-performance sealing, for example in the Visp tunnel (shown here).

108 ongoing research projects

FEDRO is currently implementing 108 road-related research projects. They concern areas such as infrastructure, road safety, traffic management and future mobility.

“New forms of human-powered mobility” / “Transport of the future” / “Continuous strain measurement with fibre optics in roads” / “Prevention of alkaline aggregate reaction in concrete” / “Impacts of automated driving”: these are examples of research projects being implemented on behalf of FEDRO and now nearing completion.

With the reorganisation, FEDRO will draw up a concept every four years and allocate specific research priorities to the various workgroups. The latter will then clarify the specific research requirements for the selected topics and subsequently provide FEDRO with an overview of the proposed research projects. FEDRO will then examine these proposals and define the detailed research programme and budget allocation. The workgroups will also be able to put forward their own ideas for research within the scope of an allocated budget.

FEDRO will outsource the research projects to external specialised companies, research organisations, Federal Institutes of Technology, etc. Each research project will be accompanied by a support commission comprising specialists from FEDRO and from private companies, universities, etc. For projects relating to road safety, the Swiss Council for Accident Prevention (bfu) will also be represented in the commission.

Swiss Association of Road and Traffic Experts (VSS) and Swiss Association of Transport Engineers and Experts (SVI)

Road research cannot take place without the inclusion of expert bodies. FEDRO works closely together with the Swiss Association of Road and Traffic Experts (VSS) and the Swiss Association of Transport Engineers and Experts (SVI).

The VSS is mainly involved in the preparation of road transport standards and also carries out research on behalf of FEDRO for the revision of existing ones. It will also pass on its findings and experiences to the individual workgroups.
Automated and networked vehicles: FEDRO pointing the way forwards

FEDRO is attaching a high degree of priority to the promotion of projects and pilot trials relating to automated, networked driving. It is working closely together with authorities at home and abroad in order to ensure that the most uniform framework conditions possible can be created for Switzerland without delay.

With regard to automated driving, a total of 6 categories have been defined. In category 0, (non-automated), the driver is fully responsible for the operation of the vehicle. In the next three categories the system increasingly takes over the driving tasks. In category 4 (highly automated), no driver is required under certain conditions, while in the highest category (5, fully automated) there is no need for a driver at all.

Licensed trials since 2015
On behalf of the Federal Department of the Environment, Transport, Energy and Communications (DETEC), FEDRO is responsible for assessing requests to carry out pilot trials with automated vehicles and for actively supporting them. In this way it is able to obtain findings relating to new forms of mobility. Every trial provides insights into a development in the mobility sector that is still in its infancy. In order for a pilot trial to be authorised, it is necessary to define the new findings it is expected to yield.

For its assessment of licensing applications, FEDRO is working together with the Federal Office of Communications (OFCOM), as well as with the Federal Office of Transport (FOT) when public transport vehicles are to be involved. For a trial to be approved, it is necessary to also incorporate the various local authorities (road owners, cantonal police, cantonal road traffic authority, etc.).

The first licensed trial in Switzerland was organised by Swisscom and took place in Zurich in 2015. This involved a passenger car which was equipped with additional sensors and driven through the city over a ten-day period. A variety of other trials have since been conducted in Switzerland.

Completed trials:
  – 2015: Swisscom, Zurich, passenger car
  – 2016: SwissPost, Bern/Solothurn, delivery robot
  – 2016: PostAuto, Sion, shuttle bus (version 1)
  – 2017: SwissPost, nationwide, delivery robots

Ongoing trials:
  – Since 2017: PostAuto, Sion, shuttle bus (version 2)
  – Since 2017: TPF, Fribourg-Marly, shuttle bus
  – Since 2018: VBSH, Neuhausen am Rheinfall, shuttle bus
  – Since 2018: TPG, Geneva-Meyrin, shuttle bus
  – Since 2018: Swiss Federal Railways, Zug, shuttle bus

The shuttle bus operated by TPF in Fribourg no longer needs a steering wheel.
Licenses for conducting pilot trials are valid for a limited period of time. As a rule, applications are requested and approved for approximately two years. Organisers of trials are required to submit semi-annual interim reports, plus a final report (describing the findings and experiences) within six months after completion of the trial. These reports are published on FEDRO’s website and thus made available to the general public (cf. link in box). In this way, interested parties wishing to conduct their own trial are able to obtain information about the current status of knowledge, which they can use as the basis for preparing new trials and obtaining further-reaching findings.

Like learner drivers taking their first lessons

From today’s perspective it can be stated that the trialled vehicles are nowhere near ready to drive themselves autonomously from A to B. They behave like learner drivers taking their first lessons, and still have great difficulty with road traffic and mastering the many complex situations they encounter. The presence of a driver (who monitors the vehicle and the traffic situation) is still absolutely essential. He or she has to be able to stop the vehicle in emergency situations.

The trial organisers have to bear all the associated costs themselves. But through the trials they are able to gain valuable findings with the new technological developments, as well as with respect to the behaviour of their personnel and clients. Here a high level of acceptance has been ascertained.

What next?

Automated driving is an ever-present topic in the media. It is clear that the vehicles being brought into circulation today are becoming ever smarter. They are being equipped with ever more driver assistance systems. However, how quickly and in which direction automated driving will evolve cannot be reliably predicted today.

FEDRO is monitoring developments throughout the world and working closely together with authorities in other countries. With ongoing technological developments, applications for new types of trials will have to be assessed. It is foreseeable, however, that vehicles will be brought into circulation in which the problems that are known today will have been solved so that it will be possible to conduct trials of significantly higher complexity in a variety of traffic situations.

Adaptation of the Federal Road Traffic Act

In accordance with current national and international legislation, in all vehicles a driver must be present who is responsible for all operational tasks. But with increasing levels of automation, drivers will hand over more and more responsibility to the vehicle’s operating system. In view of this, the UN Economic Commission for Europe (UNECE) in Geneva has for a number of years been preparing the necessary legal bases relating to vehicle technology and operation. If a breakthrough is achieved, Switzerland and the EU member states will have to adapt their legislation to the new circumstances.

Through a partial revision of the Federal Road Traffic Act it is intended to empower the Federal Council to enact the necessary legal bases without delay by amending the respective ordinances. This would make it possible for vehicles in automation categories 3 and 4 (only those with a driver) to be put into circulation in Switzerland in an orderly manner.

In order to make it possible to conduct pilot trials with intelligent vehicles more efficiently, the licensing competence is to be transferred from DETEC to FEDRO. Furthermore, FEDRO is to be empowered to delegate trials with a regional character to the involved canton. The consultation procedure regarding the partial revision of the Federal Road Traffic Act will be held in 2019.

www.astra.admin.ch/intelligent-mobility
On more than two-thirds of the network, traffic normally flows smoothly, regardless of the time of day. Traffic jams and congestion mostly occur in the vicinity of the major agglomerations, though here, too, traffic flows smoothly much of the time. The general perception is in fact distorted because traffic bulletins are normally broadcast during the peak travel periods in the morning and evening.

These periods can be fairly precisely defined on the basis of typical daily traffic volume figures. The peak periods on the motorway/national roads network are between 6.30 and 9 a.m. and 4.30 and 7 p.m. If no serious accidents occur, traffic mostly flows without disruption during the rest of the day.

If the total traffic volume were to be evenly distributed throughout the full 24 hours, it would undoubtedly be possible to travel everywhere smoothly and without traffic jams.

On certain stretches of the network, traffic comes to a standstill during peak periods on almost every weekday as well as at weekends. This is particularly the case on the Zurich northern bypass (Zurich-Winterthur) and in the Limmattal, Bern, Zurich, and the city of Arlesheim.

Availability of the motorways/national roads

Most of the time, traffic on the motorway/national roads network flows smoothly and without disruption. This statement contrasts somewhat with the commonly held view of the daily traffic situation in Switzerland.
Lausanne and Geneva regions. Today the available capacities in the major agglomerations are fully stretched during peak travel periods.

How are traffic jams hours calculated?
Traffic jam hours are calculated on the basis of Viasuisse traffic bulletins. Most of these are recorded manually, i.e. no nationwide realtime data are available for automatically processing and generating traffic bulletins. The data contained in the relevant database are processed in a separate computer program in which the traffic jam hours are calculated.

Manual input is carried out by the following organisations:
- The central Viasuisse bureau in Biel/Bienne (traffic jam reports)
- The local Viasuisse bureau in Dielsdorf (traffic jam reports for the agglomeration of Zurich)
- The National Traffic Management Centre operated by FEDRO in Emmenbrücke (traffic jams, roadwork sites, reports relating to traffic management)
- The control centres of the cantonal police forces (traffic jam reports)

The cantons carry out the tasks associated with traffic information and traffic jam reports on behalf of FEDRO. The National Traffic Management Centre is responsible for supervising the proper performance of these tasks. All the involved organisations create the data in the same format, which means that they can be exchanged at any time with the National Traffic Management Centre and the control centres of the cantonal police forces. The reliability of the reported traffic jam hours greatly depends on the available options for accurately assessing the traffic situation on the network. If a disruption is not detected, the data cannot be included in the statistics. Also, if the clearance of a traffic jam is detected too late, this can contribute towards an overestimation of the number of traffic jam hours. In order to improve the quality of data input, the methodology and system are subject to ongoing improvements by all the involved organisations.
Traffic flow

Better use of existing infrastructure, or “slower can be quicker”

The motorways and national roads are often congested during peak travel times. Traffic jams in the mornings and evenings are a common occurrence. Expanding the infrastructure is extremely expensive. It is therefore crucial to utilise the existing roads as efficiently as possible.

Switzerland’s population has risen sharply in the past few decades. This has resulted in increased housing development and expansions of the existing transport infrastructure. Despite the expansion of public transport services and targeted promotion of human-powered mobility, the volume of road traffic has nevertheless continued to grow. These developments are having a particularly strong impact on the motorway/national roads network. The expansion of the network cannot keep pace with the increasing mobility requirements. This means that the existing infrastructure has to be used more efficiently, i.e. more vehicles and people must be transported from A to B on the same stretches of road.

Management of traffic flow

According to traffic experts, a two-lane motorway can handle up to 4,000 vehicles an hour. This number can be increased if traffic flow is efficiently managed. In other words, the speed limit needs to be lowered so that more vehicles can be accommodated.

This is already being successfully accomplished on certain highly frequented stretches through the use of speed coordination and hazard warning systems. In periods of heavy traffic, the speed limit is gradually reduced to 80 km/h by means of dynamic signalling displays. The result is that all vehicles travel at the same speed, which reduces takeover manoeuvres and associated traffic disruptions. This in turn means that more vehicles can travel along the stretch concerned during the same period of time without causing a traffic jam. More of these systems are to be put into use in the next few years.

Temporary use of emergency lanes

The existing capacity can be increased without the need for expansion if vehicles are permitted to temporarily use the emergency lane. In this way, an additional lane can be made available between two nearby junctions during peak traffic periods. However, emergency lanes are there for safety reasons (e.g. in the event of a breakdown) and are also required for maintenance purposes. So, their use as an additional lane is only permissible during certain limited periods.

The emergency lanes near Muri (canton of Bern) are to be temporarily opened to traffic during peak periods.
The loss of a “safety” element is compensated through the use of technical installations such as dynamic signalling displays indicating lower speed limits, traffic lights, video monitoring systems, etc. There are currently plans to permit the temporary use of emergency lanes on ten stretches, but its implementation is time-intensive due to the necessary legal steps that have to be taken in advance.

**Avoiding peak periods**

Congestion occurs on the motorways/national roads during peak travel periods, i.e. in the morning and evening, especially in the major urban centres. Otherwise, traffic normally flows smoothly and without disruptions, and capacities are not fully utilised. These free capacities should be better utilised by encouraging travel at other times of day. This would require a fundamental change of living and working habits. This represents a challenge for FEDRO and other authorities and policymakers. Awareness must be raised in the population about mobility behaviour. By introducing flexible working hours and adapting school schedules, employers and educational institutions can also help create the necessary conditions for more effectively spreading traffic flows throughout the day.

**Overtaking bans for HGVs on certain stretches**

When HGVs decide to overtake, this results in a reduction in travel speed in the left-hand lane. On uphill stretches or when the traffic volume is high, this causes disruptions to traffic flow. Furthermore, the distances between vehicles are shortened and, especially in tunnels, drivers’ view of traffic signals can be blocked, which can result in hazardous situations. To prevent this, overtaking bans for HGVs have been introduced on critical stretches of the network. The aim here is to keep traffic flowing more smoothly and enable more vehicles to use the stretch concerned without disruption.

**Reduction of number of vehicles on the roads**

Traffic flow can also be improved by reducing the number of vehicles on the roads. The available options here include:

**Car pooling:** By sharing vehicles, more people would be able to travel along a given stretch. This form of mobility can only function if enough drivers can be found who are willing to share their vehicle, and if enough people are prepared to travel as passengers instead of driving their own car. In 2017, DETEC initiated a car pooling trial for all its units, under the leadership of FEDRO.

**Motorway access management:** To prevent congestion, traffic can be fed in to the motorway with the aid of traffic lights. The aim here is to only allow as many vehicles to enter the motorway as the traffic volume permits. This keeps traffic flowing smoothly and prevents disruptions.

**Stretches on which the temporary use of emergency lanes is planned**

<table>
<thead>
<tr>
<th>Canton</th>
<th>Project</th>
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<tbody>
<tr>
<td>Bern</td>
<td>N6 Wankdorf–Muri</td>
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<tr>
<td>Baselland/Aargau</td>
<td>N2/N3 Pratteln–Liestal–Rheinfelden junction</td>
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<tr>
<td>Lucerne/Zug</td>
<td>N14 Blegi–Rüthhof</td>
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<tr>
<td>Vaud</td>
<td>N1 Villars-Ste-Croix–Cossonay</td>
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<td>Vaud</td>
<td>N1 La Sarraz–Chavornay</td>
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<td>Vaud</td>
<td>N9 Lausanne-Vennes–Belmont</td>
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<tr>
<td>Vaud</td>
<td>N1 Aubonne–Morges-East</td>
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<tr>
<td>Zurich</td>
<td>N1 Winterthur Töss–Winterthur Wülflingen</td>
</tr>
<tr>
<td>Zurich</td>
<td>N3 Wädenswil–Richterswil</td>
</tr>
<tr>
<td>Zurich</td>
<td>N1 Zurich East–Brüttisellen junction</td>
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Traffic management – FEDRO at the helm

FEDRO is responsible not only for the construction and maintenance of the motorway/national roads network, but also for its operation. Here, one of its tasks is to influence traffic in a targeted and coordinated manner so that it flows as smoothly as possible.

FEDRO’s objectives include the enhancement of road safety by reducing the number of accidents and traffic jams. In order to achieve these goals it operates a traffic management system in the form of the National Traffic Management Centre, which was opened in 2008 and currently employs 27 staff. It is situated in Emmenbrücke (canton of Lucerne).

Traffic management encompasses the following areas of activity: steering, directing, controlling and providing information. Steering involves the diversion of traffic via alternative routes, for example to avoid trouble spots. This takes place in the form of recommendations or rerouting. The term “directing” refers to influencing traffic along a given stretch. Here the measures may include speed limits, signalling of hazards, temporary use of emergency lanes, traffic lane management. Traffic flow can also be influenced by extending the duration of green traffic lights. On motorways this involves the use of traffic feed-in systems (on congested stretches) or diversion of traffic to local roads. Information is provided via traffic bulletins and variable text display devices.

Traffic management measures have to be selected carefully and adequately coordinated. Furthermore, the relevant personnel at the federal and cantonal levels need to know what has to be done in a given traffic situation. For this purpose, FEDRO draws up management plans together with the involved cantons. These plans specify the measures that are required in certain situations and who is responsible for implementing them, so that traffic flow can be kept as smooth and safe as possible.

At the operational level, the National Traffic Management Centre permanently records and assesses the traffic situation, and orders the necessary measures to be taken in advance or in order to deal with incidents.

Holding zones for heavy vehicles

In the event of an accident or congestion on the north-south transit axes, heavy goods traffic can be held back in order to improve traffic flow for other road users. For this purpose, holding zones for heavy vehicles have been created which can be activated by the National Traffic Management Centre as required. At the same time, operators of heavy goods vehicles receive information about the option of carriage by rail.

In the future, technological developments in the transport sector will also open up new promising potentials with respect to traffic management. For example, automated driving could pave the way for the more efficient use of the motorway/national roads network.
Police are responsible for the initial safety-relevant intervention following road accidents, vehicle breakdowns, weather-related incidents and natural disasters. The measures they may take in dealing with these situations include, for example, information bulletins and traffic diversions. But what happens after that? The initial actions taken by police often have to be followed or accompanied by other traffic management measures. On Swiss motorways and national roads, these measures are ultimately under the responsibility of FEDRO, as are the measures necessary to relieve congestion and traffic jams on the roads.

The National Traffic Management Centre is a unit of FEDRO and is the operational control centre for traffic management. The traffic operators at the centre continuously monitor and analyse road traffic. They verify traffic reports and, based on traffic management plans, they decide what, if any, response measures need to be taken. These measures may include, for example, re-routing of traffic by means of major diversions, permitting the temporary use of emergency lanes and crossover or two-way traffic in tunnels or on open roads, and, in particular, informing road users accordingly.

The federal government has mandated Viasuisse with the task of communicating information about the traffic situation and the measures ordered by the National Traffic Management Centre. This information is dispersed via radio and TV, the Radio Data System (RDS), the Traffic Message Channel (TMC) and the Internet. The various parties involved share information with each other through the network of the national traffic data organisation of Switzerland. This ensures a uniform, collective database, which is an important condition for utilising the available traffic data in the best possible way.
Traffic algorithms calculate the most efficient speeds

How does an intelligent traffic management system know what driving speeds it should post? Algorithms and manual operations both play a role in influencing traffic on the motorway and national roads network.

Traffic is dynamic and inhomogeneous. No situation is identical to another. Traffic on Switzerland’s motorways and national roads can be influenced by means of dynamic variable signalling. Depending on the situation, the current maximum speed limit, hazard warnings, temporary use of emergency lanes, temporary bans on overtaking for heavy goods vehicles, diversions and other traffic information can be communicated to road users. Signalling is adjusted according to the situation and traffic. Road users are not aware of the complex, technical reasons that ultimately determine variable signalling.

Electronic data processing and technical algorithms are at work in the background. These take the form of a set of rules to be followed in recurring problem-solving operations. Different algorithms are used depending on the purpose of the traffic management measure in question. The algorithms used in traffic management help achieve an optimal flow of traffic for road users overall, depending on the situation. This approach considers the entire system, not individual road users.

Being informed about the traffic situation is a requirement

A basic requirement for variable signalling is knowing what the traffic situation is like on location. Detectors measure various parameters of traffic flow. This information is automatically processed and analysed, and from this the signalling requirements are derived. Signalling to coordinate speed limits and hazard warnings alerting drivers to upcoming traffic jams are calculated and implemented on a fully automated basis. Signals can also be enabled manually, such as in the case of roadwork sites.

Diagram showing how traffic flow changes when traffic density increases.
To prevent signalling over short stretches from changing too frequently or contradictions in signalling, the individual calculated requirements are coordinated with one another and an overall state of operation is derived.

**Traffic status**
Traffic flows can be categorised into three different status levels. For example, an algorithm for coordinating speed limits is based on this three-level model of traffic status. The simplest case is that of “free-flowing traffic”, which requires no intervention.

In “synchronised traffic”, many interactions are occurring among the various road users. Driving speeds are aligning, the number of vehicles on a given stretch is steadily increasing, and the flow of traffic is reaching its capacity limits. Shock waves of congestion seemingly build up out of nowhere (“accordion effect”), or traffic may even come to a complete standstill (“traffic jam”).

As congestion builds, the throughput of vehicles travelling on the road declines, and a traffic back-up forms. Scientific studies have shown that after a breakdown in traffic flow, the maximum capacity of the road stretch in question is around 10 to 30 percent lower than before the traffic breakdown. The stretch does not regain its full capacity potential until after there is an interim period of free-flowing traffic.

**Goal of traffic management**
The purpose of the algorithms for harmonising speed limits is to avoid a breakdown in traffic flow from the perspective of the traffic system as a whole and thus keep traffic flowing at a high level.

The success of this depends on the calibration of the algorithms and the behaviour of road users.

**Bird’s-eye view**
The result of harmonising speed limits over a given stretch of road is most easily exemplified by travel time. In order for as many vehicles as possible to pass a cross-section of road, traffic must be as regular and homogeneous as possible. This may mean that the travel time for some road users is prolonged, but the collective travel time of all road users is reduced.

Individual road users compare the traffic situation at the time of signalisation with the traffic situation recognisable directly in their field of view. However, the direct, subjective perception of a traffic situation by an individual road user (“frog’s-eye view”) differs from the optimal solution for all road users in the system as a whole (“bird’s-eye view”).

**Harmonising algorithm logic**
For historical reasons, the traffic management systems in use today on Switzerland’s network of motorways and national roads apply different algorithms and traffic steering philosophies. FEDRO did not take over responsibility for the motorways and national roads and their traffic management from the cantons until 2008. Since then, it has operated the National Traffic Management Centre in Emmenbrücke. Harmonising traffic rule logic and algorithms is an essential step in standardising the existing traffic management systems. Standardising the systems will permit an efficient traffic management that keeps traffic flowing smoothly. In 2018, FEDRO published a directive on this; until then there had been no uniform national standards. FEDRO Directive 15019 bundles together the applicable technical specifications, including those for the algorithms, and thus fills an important gap in the harmonisation effort. FEDRO is committed to further promoting traffic management. In particular, the potential of traffic-dependent signalisation is to be better exploited.
Mobility pricing: model testing in the canton of Zug

Those who use the roads and railways should pay for their use accordingly. That is the principle behind mobility pricing. How does mobility pricing influence traffic? Can it help relieve congestion on roads and in public transport? How high must the pricing per kilometre be to achieve the desired effect? These questions were examined in model testing conducted on behalf of FEDRO in the canton of Zug.

The results of the model testing are expected to be available in the second half of 2019. Mobility pricing has the potential to ease congestion during peak periods and enable the more efficient use of road and railway capacities. The Federal Council asked the Federal Department of the Environment, Transport, Energy and Communications (DETEC) to study the effects of mobility pricing, taking the canton of Zug as an example and applying a theoretical impact analysis based on traffic model calculations. The Federal Council defined several basic principles to serve as framework conditions. First and foremost, on balance no additional costs were to result for road and public transport users, meaning that the revenue generated by mobility pricing must be compensated elsewhere. This could be achieved, for example, by eliminating the motorway sticker (“Vignette”) or reducing fuel taxes. In spring of 2018, a team of specialists led by FEDRO commenced work on the project. The goal of the impact analysis, taking the canton of Zug as an example, was to provide information about the effects of mobility pricing on traffic, commerce and the environment: What tariffs would be practicable and when should they be applied? To what degree can the volume of traffic be reduced at peak times? How much less time would be spent in traffic jams as a consequence? What effect would a high per-kilometre mobility price in the urban agglomeration have on the businesses there? Does mobility pricing encourage urban sprawl?

The final report on the testing, which is scheduled to be published in the second half of 2019, will provide answers to these and other questions. The Federal Council will then decide on what steps to take next with regard to mobility pricing in Switzerland.

Influencing mobility demand

In the concept report on mobility pricing issued in 2016, the Federal Council explained its understanding of mobility pricing and what it wants to achieve with it – mobility pricing is to be an instrument for solving capacity problems in Switzerland’s transport systems. The intention is not to increase the overall costs of mobility in future, but for it to be paid for in a different way. The Federal Council also sees it as important that mobility pricing encompasses all forms of transport, as the roads and railways complement each other as means of transport and both are at the limits of their capacity in the city centres and urban agglomerations. In the Federal Council’s view, however, mobility pricing alone will not suffice to relieve congestion and bottlenecks to the extent required during peak periods. Further measures are also essential, such as flexible working models, changes to school classroom schedules, home offices, car pooling and car sharing. In the summer of 2016, the Federal Council mandated the Federal Department of the Environment, Transport, Energy and Communications (DETEC) with the task of liaising with interested cantons and regions to examine the feasibility of pilot trials for mobility pricing. In the discussions that followed, it was concluded that conditions are not suitable for pilot trials at present. The canton of Zug therefore agreed to make its overall cantonal transport model available as a basis for FEDRO to perform a theoretical impact analysis of mobility pricing and its consequences, so as to gain further concrete insights into the issue as per the Federal Council’s mandate.

www.astra.admin.ch/mobility-pricing
Active approach to risks and opportunities

Thanks to systematic risk management, FEDRO is able to identify a broad variety of risks at an early stage and thus reduce them to an acceptable level. At the same time, when preparing projects FEDRO emphasises the need to take account of opportunities and utilise these wherever possible. Risk and opportunity management is an essential instrument for FEDRO to accomplish its tasks and achieve its objectives.

Risk management is an essential instrument. It provides an overview of the current risk situation and facilitates the early implementation of the necessary measures. In order to be able to identify the importance of the various risks, the probability of their occurrence as well as their potential impacts have to be assessed. The determination of probability of occurrence is carried out within the federal administration on the basis of uniform criteria. The potential impacts are examined and described on the basis of the following dimensions: financial consequences, injuries, damage to reputation, negative effects on business processes, environmental impacts. For each relevant dimension a scale ranging from low to very high is used for classifying potential impacts. In the past few years, FEDRO identified ten strategic risks each year.

During the performance of its tasks, FEDRO cannot rule out risks entirely. It is prepared to consciously accept and manage risks in situations in which this is unavoidable. In keeping with the principle of the careful deployment of federal financial resources, FEDRO aims to keep risks as low as possible. Decisions regarding the implementation of measures are taken on the basis of cost-benefit deliberations. As of the end of 2018, 23 measures had been implemented in order to minimise identified risks.

Opportunities are incorporated into project planning in the same way as risks. Opportunities as well as risks can arise in all the cited dimensions and with varying degrees of probability of occurrence.

Continuity management

Business continuity management is an integral part of integrated risk management, and it focuses on incidents. Its purpose is to minimise the impacts of a given incident on critical services and business processes. FEDRO has prepared the corresponding action plans and trialled the associated processes.

Development of a risk management system

FEDRO’s risk management system is embedded in the overlying system operated by the Federal Department of the Environment, Transport, Energy and Communications (DETEC). This ensures that FEDRO’s risks are incorporated into the overall federal risk assessment process. Strategic risks are defined and consolidated once a year at both the divisional (bottom-up) and the management (top-down) level, and measures are specified where necessary. The management of FEDRO is responsible for monitoring the implementation of these measures.

In addition, risks are also systematically identified and monitored at the operational level in construction and IT projects. Operational risk management is also supplemented with the identification of opportunities. At the process level, the internal control system is a central element for the minimisation of risks.
Protection against forces of nature

On 26 December 2018, a large rockfall occurred above the Axen route in the canton of Uri. No one was injured and the road was not damaged, but it nonetheless had to be closed for safety reasons – an example of FEDRO’s approach to natural hazards.

At 7.30 a.m. on 26 December 2018 the Uri cantonal police received a report that a rockfall had occurred on the Axen route (N4) near the northern portal of the Zingel tunnel. Fortunately, no one had been injured. Although around 50 cubic metres of rock had fallen, which is equivalent to the volume of a garage for a passenger car, neither the tunnel portal nor the gallery itself had been damaged. Nonetheless, the Axen route between Sisikon and Flüelen had to be closed immediately for safety reasons, because the risk of further rockfalls could not be ruled out. The stretch was only reopened to traffic once specialists had declared it safe after a thorough inspection had been carried out and the debris had been completely cleared.

One-sixth of the motorway/national roads network is exposed to natural hazards

Like the Axen route, numerous stretches of the motorway/national roads network run through zones susceptible to natural hazards, mainly due to the topographic circumstances. Currently, around 300 of the network’s total of more than 1,850 kilometres are exposed to natural hazards such as mudslides, landslides, avalanches and rockfalls. This means that the protection of the infrastructure and the people who use it is of the utmost importance for FEDRO.

In 2008, in cooperation with the Federal Office for the Environment (FOEN), the National Natural Hazards Platform (PLANAT), the cantons and universities, FEDRO launched a project concerning the management of natural hazards on the motorways and national roads.

Risk identification and assessment

As a first step, FEDRO prepared hazard warning maps for the entire network showing which hazards exist, and where. These risks then have to be assessed as thoroughly and accurately as possible. The next step is to define the necessary protective measures, as well as the action to be taken in the event of a disaster and to repair any resulting damage.

Thanks to structural measures, a tunnel entrance on the Axen route was left undamaged by the rockfall.
The protective measures may be structural or organisational in nature. Structural measures include special meshes to prevent rockfalls, or debris retention basins. One of the main organisational measures concerns the precautionary closure of a stretch, for example due to the risk of an avalanche. The cost-benefit ratio (based on marginal cost considerations) is a decisive factor for the choice of a given measure.

The average annual costs for the protection of the motorways and national roads against natural hazards (identification of risks, analyses, plus construction, maintenance and operation of protective installations) run into tens of millions, with annual fluctuations depending on the extent to which protective structures need to be renovated or replaced.

Back to the Axen rockfall...
The rockfall that occurred on the Axen route on 26 December 2018 was by no means unexpected. The region is recognised as a source of hazards and protective measures have been implemented along this route. The emergency services (police, fire brigade, ambulance), plus the Canton of Uri Office for Motorway Operation and FEDRO, are well prepared. A geologist was already on site on the morning of 26 December 2018, so even though this was a public holiday it was possible to carry out a comprehensive assessment of the situation without delay. During the morning, specialists inspected the affected zone from a helicopter. In this way it was ascertained that, with the implementation of rudimentary measures, the stretch could be opened to traffic again as soon as the debris had been cleared. The clearance operation was carried out efficiently by a private transport company. The Axen route was reopened to traffic at 4.30 p.m. – just nine hours after the occurrence of the rockfall. This incident provides a good example of how FEDRO deals with natural hazards.

Occurrence of a second rockfall
The Axen route had to be closed again on Friday 11 January 2019 due to another rockfall, this time in the vicinity of the southern portal of the Zingel tunnel. The volume of rock was relatively low this time (around five cubic metres). By way of comparison, a four-axle tipper with a total weight of 32 tonnes has a loading volume of twelve cubic metres. Once again, no one had been injured. The stretch was reopened to traffic shortly after midnight.
On 31 March 2018 the automatic emergency call system, eCall, was declared mandatory for newly registered passenger cars and delivery vehicles throughout Europe. It is based on the standardised European emergency call number 112 and is triggered automatically by the vehicle in the event of a serious incident. It can also be activated manually.

When activated, the system calls the nearest emergency response centre, which also receives information about the incident, including the time and location, as well as the type of vehicle. This enables the emergency response centre to dispatch the necessary crew quickly and efficiently. Thanks to this system, the number of fatalities and serious injuries on our roads can be further reduced.

To identify the exact time and location of the incident, eCall requires a satellite navigation receiver and a mobile communication module for the transmission of the data. Unlike a smartphone, the module (which is equipped with a “sleeping” SIM card) only dials into a mobile phone network if eCall triggers an emergency call. This means the vehicle cannot be tracked via eCall.

In accordance with the relevant bilateral agreement with the EU, eCall is also being installed in vehicles in Switzerland, where the system automatically connects to local emergency response centres. The involved police forces are currently making preparations to receive additional data from eCall. FEDRO is assisting the relevant authorities and monitoring the international development of the system.

Vehicle manufacturers and insurers have already been providing emergency call services and other types of aid. While “third-party eCall” functions via mobile phone networks, eCall uses the standard emergency call number, 112. Communication via this number takes precedence over all other mobile connections and thus functions even when the mobile phone networks are working at full capacity. To avoid confusion with “third-party eCall”, eCall is designated “eCall112”. Although “third-party eCall” may still be installed in newly registered vehicles in addition to “eCall112”, only one of these systems may be activated at a time.
Galileo – not just a navigation system

The European satellite navigation system, “Galileo”, is nearing completion. Its development is scheduled to be completed by 2020. Switzerland is also involved in the development and operation of this system.

Satellite navigation systems such as Galileo will soon be having a decisive influence on a variety of sectors. High-precision satellite signals are, for example, a prerequisite for driver assistance systems in both the road and rail transport sector. These systems help make transport more efficient as well as safer. In the aviation sector, satellite technology already plays a major role today. The low-flight networks permit flying in poor visibility conditions, for example, and thanks to Galileo this will be possible under even more difficult conditions.

Galileo was conceived as a civilian and independent alternative to the military satellite navigation systems of the USA (“GPS”) and Russia (“Glonass”). The completion of Galileo, with a total of 30 satellites in orbit round the Earth, is scheduled for 2020. Some of its services have been publicly available since 2016. Users of mobile phones equipped with the necessary receiver already benefit – knowingly or otherwise – from high-precision Galileo signals.

Uses in the forestry, agriculture and energy sectors
Galileo technology is not solely intended for use in the transport sector. It can also be used for improving the accuracy of surveying activities, which can facilitate the more sustainable management of forests. In the agriculture sector, it can also reduce water consumption and the use of fertilisers.

The Galileo satellites will also have an impact on future energy supply. The highly accurate time signals can be used for coordinating effective electricity production in real time. This will enhance network stability and reduce potential overproduction.

Galileo is an EU infrastructure project. Switzerland is involved in the financing of its development and operation. FEDRO is coordinating Switzerland’s participation in the project, which has been regulated in a cooperation agreement that secures Switzerland’s access to the various system services as well as its involvement in the main administrative bodies. The agreement also secures access for Swiss companies and research organisations to Galileo-related bidding procedures.
Electric mobility

Proportion of electric cars to be increased to 15 percent by 2022

In order to increase the proportion of electric cars, the Federal Department of the Environment, Transport, Energy and Communications (DETEC) has agreed on an “Electric Mobility Roadmap” with numerous companies and industry associations. The goal here is to increase the share of newly registered electric vehicles to 15 percent by 2022.

The “Electric Mobility Roadmap” that was proposed by DETEC was concluded in December 2018. More than 50 organisations and companies from a variety of sectors were involved in its development and finalisation. It lists specific measures in the areas of successful market development of vehicles and optimal recharging infrastructure, plus incentives and framework conditions.

The federal government is to implement a variety of measures to promote the development of recharging stations and electric mobility. The planned installation of fast-charging stations in 100 rest areas along the motorway/national roads network is a highly-promising measure. FEDRO issued a call for tenders for five packages encompassing 20 locations each throughout the country. From the total of eight bidders, five were awarded the mandate of operating the fast-charging stations in the respective rest areas. The first stations are expected to be ready for operation from 2020.

www.astra.admin.ch/electric-mobility

Rest areas (without restaurants) and service areas (with restaurants) where fast-charging stations are planned or already installed.
Safe passage for wildlife as well as road users

Wild animals use the routes – wildlife corridors – they have always been accustomed to. But our roads often intersect with these and thus prevent wild animals from using them. In order to preserve these corridors, FEDRO has constructed thirty large wildlife bridges over the motorway/national roads network, plus numerous smaller underpasses.

The thirty large wildlife bridges, many of which are up to 50 metres wide, provide a safe passage across motorways and national roads for animals such as red deer, roe deer and wild boar. In addition, numerous smaller underpasses have been constructed for animals such as badgers, foxes, squirrels and weasels. Since the early 1990s, when studies began to focus on the environmental impacts of roads, wildlife passages have been integrated into the planning and construction of motorways and national roads. Studies showed that animals make frequent use of these passages: 10 to 25 crossings a day, or between 3,600 and 9,000 a year, depending on the location.

Thus it soon became clear that these passages are beneficial for wild animals. In addition to the thirty existing wildlife bridges, two more are currently under construction, in Cornol (near Delémont, canton of Jura) and Claro (near Bellinzona, canton of Ticino). The construction of four more is scheduled to commence in 2020: in Rohr-Hunzenschwil (canton of Aargau), Neuenkirch (canton of Lucerne), Knutwil/Sursee (canton of Lucerne) and Langnau bei Reiden (canton of Lucerne). In the medium term, there will be 41 wildlife bridges on the motorway/national roads network.

Protecting wildlife and the network

In 2001, DETEC drew up a set of guidelines and a renovation programme for wildlife bridges in collaboration with FEDRO. Each year, around 9,000 roe deer, 4,000 red deer and 600 wild boar are killed in road traffic. Fences protect the motorway/national roads network and in combination with wildlife bridges they also increase the safety of animals as well as road users. In accordance with the Federal Council’s 2012 “Swiss Biodiversity” strategy and the “Biodiversity Action Plan”, the intention is to avoid additional obstacles for wildlife, reduce the impact of the existing obstacles and provide wildlife with safer corridors.

FEDRO directive 18008, “Crossing aids for wild animals”, implements the Federal Council’s strategy by constructing or renovating wildlife bridges. A study conducted by FEDRO showed that it is possible to make the existing bridges and underpasses on the motorway/national roads network usable for smaller wild animals too, at little extra cost. This can often be done by planting bushes and hedges that guide wild animals to the nearest crossing.

FEDRO operates a database for engineering structures on the network that help protect wild animals. When these structures need to be renovated, the protection of wildlife is duly taken into account. In order to maintain wildlife corridors over the long term, coordination with the cantons regarding their structure and zoning plans is essential.
Road transport: Switzerland with same rights and obligations

The Land Transport Agreement of 1999 between Switzerland and the European Union (EU) opens up to Switzerland the market for the transport of persons and goods by road and rail in Europe. As a result, barriers to market access were dismantled and comparable conditions for competition created for companies in both Switzerland and the EU.

The Land Transport Agreement is one of the seven agreements that Switzerland concluded with the EU in 1999, known collectively as "Bilaterals I". It was accepted by the Swiss electorate in a referendum. The agreement consolidates Switzerland’s long-term cooperation with the EU in the road and rail transport sectors and ensures the continuation of Switzerland’s policy of transferring freight for transit through Switzerland from road to rail within the European context. The agreement eliminates technical barriers, facilitates access for Swiss road haulage companies to the European transport market, and creates comparable conditions for competition between Switzerland and the EU.

With regard to heavy-duty transport, upholding the ban on night and Sunday traffic in Switzerland, as well as the introduction and recognition of the distance-related heavy vehicle fee, form cornerstones of the agreement. The agreement is based on the principle of non-discrimination. As a result of the agreement, various standards in the area of professional admission, social legislation concerning HGV drivers, as well as technical standards and weight limits for HGVs have been harmonised to a large degree. The agreement works in accordance with the principle of equivalence of legislations of the contracting parties, or the equivalence principle. The rules do not necessarily have to be identical but their effect and scope must fully correspond.

Legislation governing working and rest times for professional drivers

At the EU level, legislation governing working and rest times for drivers of goods vehicles are standardised and as a result of the agreement harmonised between Switzerland and the EU. Switzerland has aligned its legal provisions in the Work and Resttime Ordinance with EU guidelines. This is expected to ensure that the same rules apply for all professional drivers in the context of cross-border transport and in particular that the same provisions concerning social protection apply.

The provisions governing driving times, for example, stipulate in particular the maximum daily and weekly driving times, breaks, and the minimum daily and weekly rest times. An important instrument for checking adherence to stipulated working and rest times is the tachograph, which records times automatically.

The intelligent tachograph

New EU rules have led to the introduction of the “intelligent tachograph” in the EU as of 15 June 2019. This latest generation of tachograph integrates new technical developments and is expected to improve monitoring compliance with the rules governing work and rest times. To ensure that Swiss haulage operators can continue to have the freest possible access to the European road transport market, the new tachographs were introduced in Switzerland at the same time as they were in the EU.

The Federal Office of Transport (FOT) lead manages the Swiss-EU Land Transport Agreement. FEDRO, the Directorate of European Affairs (DEA) and the Federal Customs Administration (FCA) are also active in implementing the agreement.

Timeline of the Land Transport Agreement

− 21 June 1999: Signing of the agreement (within the framework of Bilaterals I).
− 21 May 2000: The Swiss electorate approve the agreement in the referendum on Bilaterals I (with 67.2% in favour).
− 1 June 2002: The agreement comes into force.
Development of the motorway/national roads network

In 1960, Parliament passed a resolution defining the layout of the motorway/national roads network. In the meantime, 1,858.9 kilometres are now in operation, leaving a further 33.6 kilometres to be constructed. FEDRO is the supervisory authority for the completion of the network, while the involved cantons are responsible for its development.

The federal resolution concerning the motorway/national roads network was formally adopted on 21 June 1960. Parliament defined the routes to be constructed by the federal government, and since then only minor adjustments have been made.

Today, 59 years later we can safely say that the defined layout is still in line with present-day needs. The network links the major urban centres and provides the necessary transit routes. The original concept has proved to be largely successful, even if some stretches are now reaching the limits of their capacity.

Close to completion

The federal resolution defines a total of 1,892.5 kilometres, which means a further 33.6 kilometres still have to be constructed. The stretches concerned lie in seven regions: A1/A3 in Zurich (“Stadt-Y”), A3 in Basel (railway station to Gellert), A4 in Schwyz (new Axen route”), A5 in Biel (western link), A9 in Upper Valais, A8 on the Brünig and A28 in Prättigau.

Until 2007 the cantons were responsible for the motorways/national roads, while the federal government acted as the supervisory authority. With the redistribution of financial responsibility and the accompanying division of duties the ownership of the network was transferred to the federal government. But in order to preserve the continuity of the network completion projects, it was decided that the cantons would retain responsibility and the federal government would continue to function as supervisory authority. The remaining projects for the completion of the originally defined network are expected to be completed by 2034.

Within the scope of the Fund for Financing Motorway and Agglomeration Traffic, approximately 400 kilometres are to be added to the network. The amended resolution will enter into force on 1 January 2020.

The shell of the Grosseya tunnel near Visp, part of the new stretch of the A9.
2.4 billion Swiss francs for construction, expansion and maintenance

The federal government is to invest around 2.4 billion Swiss francs in the motorway/national roads network in 2019. 260 million have been budgeted for the construction of new stretches, 1.572 billion will be spent on the expansion and maintenance of the existing network and 210 million for the elimination of bottlenecks.

The approximately 2.4 billion Swiss francs will come from the Fund for Financing Motorway and Agglomeration Traffic. In addition, the federal government will invest around 378 million Swiss francs in the operation of the network. DETEC has approved the proposed construction programme for 2019.

Work on the following maintenance projects is to commence in 2019:
- A1 Bern: Kirchberg to Kriegstetten
- A1 Aargau: Reusstal to Neuenhof
- A1 Zurich: Zurich East junction to Effretikon
- A2 Lucerne: Reiden to Sursee
- A2 Nidwalden: Lucerne/Nidwalden border to Hergiswil
- A2 Uri: Amsteg to Göscheneralp
- A2 Uri: Gotthard Pass North
- A13 Grisons: Avers to Bärenburg to Zillis
- A13 Grisons: Sufers to Traversa South Gallery
- A13 Grisons: Hinterhein North to Cassanawald South
- A16 Bern: Tavannes to Bözberg to Delémont
- A16 Jura: Porrentruy to Delémont

Maintenance work on the following stretches will be continued in 2019:
- A1 Zurich: Zurich Unterstrass to Zurich East (Schwamendingen enclosure)
- A2 Basel-Stadt: Basel eastern ring road
- A2 Basel-Landschaft: Schänzli
- A2 Solothurn/Basel Landschaft: Belchen renovation tunnel
- A2 Ticino: Airolo to Quinto
- A2 Ticino: Giornico heavy vehicle inspection centre
- A3 St Gallen: Murg to Walenstadt
- A4 Schwyz: Küsnacht to Brunnen
- A5 Neuchâtel: Colombier to Cornaux
- A6 Bern: Thun North to Spiez
- A9 Vaud: Vennes to Chexbres
- A9 Valais: Martigny and environs

Elimination of bottlenecks
A total of 210 million Swiss francs has been earmarked for the elimination of bottlenecks in 2019. Most of this will be spent on the widening of the Zurich northern bypass (A1) to 6 lanes.

Completion of the network
A total of 260 million Swiss francs has been budgeted for the completion of the network. The largest credits have been allocated to the following cantons: Valais, 112 million; Bern, 22 million; Jura, 9 million; Schwyz, 4 million; Obwalden, 4 million. Approximately 77 percent of the funding for the completion of the network will be used for projects in Western Switzerland and Upper Valais.

Only a few stretches still have to be constructed (approx. 35 kilometres). Responsibility for the completion of the network will be shared by the federal government and the cantons as before: the cantons are responsibility for development, while FEDRO is the supervisory authority.

FEDRO will also be spending around 378 million Swiss francs on the operational maintenance of the network. This includes winter services, greenery maintenance, repairing damage caused by accidents, general cleaning tasks.

www.swiss-motorways.ch
Five major projects on the motorway/national roads network

A2 – New heavy vehicle inspection centre in Giornico
Construction of a heavy vehicle inspection centre with multiple service area in Giornico (canton of Ticino) / objectives: intensification of heavy vehicle inspections and controlled feed-in of HGVs in transit / duration, 2018 to 2022 / renovation of industrial site in accordance with applicable legal provisions, demolition of existing buildings / construction of new motorway junction / continuation of work on new underpasses / handover of heavy vehicle inspection centre at the end of 2022 / costs: approx. 250 million Swiss francs.

A1 – Modification of Grand-Saconnex junction
Work to commence during 2019 / construction of a cable-stayed bridge / alteration of north and south intersections / modification of access roads and parallel lanes along the motorway / adaptation of stretch to accommodate future widening / complete maintenance of stretch between Hall 6 and Vengeron intersection / duration: 2019 to 2023 / total costs: 240 million Swiss francs.

A2 – Lucerne–Hergiswil
Maintenance of stretch between Lucerne and Hergiswil / duration: 2019 to 2021 / replacement and resurfacing of traffic lanes / improvement of noise abatement measures / adaptation of drainage to current requirements / replacement of operating and safety installations / reinforcement of Lopper tunnel to protect against earthquakes and damage due to collisions / emergency lane to be converted for use as third traffic lane between A8/A2 junction and entrance road to Hergiswil / costs: approx. 121 million Swiss francs.

A1 – Kirchberg–Kriegstetten

A1 – Maintenance of St. Gallen urban expressway
Comprehensive maintenance of St. Gallen urban expressway between Winkeln and Neudorf, including Kreuzbleiche and St. Finden junctions / replacement of operating and safety installations / construction of 4 new drain-water treatment plants / extension of service life of existing infrastructure (as preparation for the later St. Gallen bottleneck elimination project (work to commence in 2031 at the earliest, scheduled completion, 2040) / total costs: approx. 500 million Swiss francs.

These five construction projects are examples of FEDRO’s approximately 800 ongoing maintenance projects.
Approval procedure for 2nd Gotthard road tunnel is on track

The approval procedure for the 2nd Gotthard tube is proceeding as planned. Following the public presentation of the plans in May 2018, the preliminary procedure will be concluded in mid-2019. The planning approval ruling is to be announced during the winter.

Following the completion of the implementation project, the planning and approval procedures are proceeding according to schedule. The public presentation of the implementation project was carried out in May 2018 in the involved municipalities. Thanks to intensive cooperation and punctual input from the local residents, environmental organisations and third parties regarding the development of the implementation project, it was possible to take account of various concerns and innovative proposals and thus find acceptable solutions for all involved parties. This is reflected in the low number of objections (14 in all), some of which have since been clarified and withdrawn. The preliminary procedure, in which the various federal authorities are able to comment on the implementation project, is currently in progress. The DETEC General Secretariat is responsible for this phase. DETEC will rule on the planning approval within six months after the preliminary procedure has been concluded.

In December 2018, the contracts with the project developers were signed following the completion of public procurement procedures. The main mandates for the development of the project, installation of the operating and safety equipment and roofing of the Airolo section have been awarded, and the development of the detailed projects and initial submission documentation for their implementation are assured. If the planning approval decision is announced on time, preliminary work should commence in 2020.

www.astra.admin.ch/gotthard
Facts, figures, statistics

582 employees
10 locations People
39 IT systems

Data 5,510 managed datasets
Replacement value of motorway/national roads network: 82.5 billion Swiss francs
Expenditure: 4.26 billion Swiss francs Finance
Investment in infrastructure: 2.4 billion Swiss francs
Length of motorway/national roads network: 1,858.9 kilometres
Connections: 390 Tunnels: 252
Infrastructure Large-scale wildlife corridors: 34
Bridges: 3,500 (main axes and overpasses)
Drainage water treatment plants: 118
Junctions: 45 Service areas (restaurants): 48 (ownership by cantons)
Rest areas (picnic): 110 Construction projects: 737
Concluded construction contracts in 2018: 2,970
Traffic counting stations: 320 Vehicles
Vehicle kilometres on the network: 27 billion
Highest average daily traffic volume: 144,000 vehicles (Wallisellen)
HGVs via main transalpine routes: 941,000
Heavy vehicle inspection centres: 6
Construction sites: 105
Eyholz tunnel in Valais was the only new motorway stretch opened in 2018

Only one new stretch of the motorway/national roads network was opened in 2018: the Eyholz tunnel on the A9 near Visp (canton of Valais). This stretch is 4.2 kilometres long and comprises 4 lanes. The total length of the network is now 1,858.9 kilometres, leaving a further 33.6 kilometres to be constructed. The construction of four additional new stretches is currently in progress: on the A9, in the cantons of Valais, Schwyz (new Axen route), Obwalden (Kaiserstuhl) and Grisons (Prättigau). No stretches are scheduled for completion in 2019. As of 1 January 2020, however, the network will be expanded by around 400 kilometres following the integration of a number of sections of cantonal roads, the importance of which has grown significantly due to the sharp increase in traffic volume. When these stretches are transferred to the federal government, the maintenance costs will also be covered at the federal level.

2018: opening of one stretch with a new tunnel (total: 252 tunnels on the motorway/national roads network)

<table>
<thead>
<tr>
<th>Motorway</th>
<th>Canton</th>
<th>Stretch</th>
<th>No. of tubes</th>
<th>4 lanes</th>
<th>Costs (Swiss francs)</th>
</tr>
</thead>
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<tr>
<td>A9</td>
<td>VS</td>
<td>Visp West–Visp East (Eyholz tunnel)</td>
<td>2</td>
<td>4.2 km</td>
<td>670 million</td>
</tr>
</tbody>
</table>

Status as of January 2019
- Completed
- In the project or construction stage (anticipated completion date)
The Swiss motorway/national roads network

Total length by road category (km)

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<tr>
<th>Region</th>
<th>8-lane</th>
<th>7-lane</th>
<th>6-lane</th>
<th>5-lane</th>
<th>4-lane</th>
<th>3-lane</th>
<th>2-lane</th>
<th>Mixed-traffic roads</th>
<th>Total</th>
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<td>19.4</td>
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<td><strong>Total</strong></td>
<td>1.8</td>
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<td>1.9</td>
<td>283.7</td>
<td>111.5</td>
<td>1,858.9</td>
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</table>

As of the end of 2018, the length of the Swiss motorway/national roads network was 1,858.9 kilometres. The 1960 resolution of the Federal Council called for a total of 1,892.5 kilometres. This means that a further 33.6 kilometres have yet to be opened in order to complete the planned network. In 2018, a 4.2-kilometre stretch was completed: Eyholz tunnel to the east of Visp (canton of Valais) – cf. page 40.
Number of heavy goods vehicles crossing the Alps down again in 2018

The number of HGVs and semi-trailers travelling through the Alps continued to decline. In 2018, the total was 941,091, which is 13,000 (1.4 percent) fewer than in 2017. Thus, the downward trend observed in the past few years is persisting. The volume fell by 2.1 percent in 2017 and 3.4 percent in 2016. In 2018, the number of journeys fell less sharply than the quantity of goods transported by road (0.2 percent), a trend that is attributable to making better use of the vehicles’ capacities. The Gotthard and the San Bernardino remain the most important transalpine routes through Switzerland. In 2018, the number of journeys was down 33 percent versus the figure recorded in 2000, the year in which the Heavy Vehicle Fee was introduced together with the framework conditions for the step-by-step increase in the weight limit of heavy goods vehicles to 40 tonnes.

<table>
<thead>
<tr>
<th>Year</th>
<th>San Bernardino</th>
<th>Simplon</th>
<th>Grand St-Bernard</th>
<th>Gotthard</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td>1980</td>
<td>149,000</td>
<td>11,000</td>
<td>63,000</td>
<td>21,000</td>
<td>244,000</td>
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<tr>
<td>2014</td>
<td>151,475</td>
<td>77,274</td>
<td>45,505</td>
<td>758,336</td>
<td>1,032,590</td>
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<tr>
<td>2015</td>
<td>157,407</td>
<td>83,046</td>
<td>39,644</td>
<td>729,609</td>
<td>1,009,706</td>
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<tr>
<td>2016</td>
<td>148,087</td>
<td>90,053</td>
<td>37,187</td>
<td>700,729</td>
<td>975,056</td>
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<td>2017</td>
<td>150,356</td>
<td>80,659</td>
<td>25,546</td>
<td>697,651</td>
<td>954,212</td>
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<tr>
<td>2018</td>
<td>144,000</td>
<td>86,295</td>
<td>33,796</td>
<td>677,000</td>
<td>941,091</td>
</tr>
</tbody>
</table>

Change 2014-2018:
- San Bernardino: −4.2%
- Simplon: 7.0%
- Grand St-Bernard: 32%
- Gotthard: −2.9%
- Total: −1.4%

Source: Federal Roads Office FEDRO
In 2018, the total accumulated distance travelled on Switzerland’s motorways/national roads was 27.696 billion kilometres. Thus, the accumulated distance remained practically unchanged versus the previous year (+0.1 percent). By contrast, the number of traffic jam hours fell by two percent.

For the third time since 2016, more than 27 billion kilometres in distance travelled were recorded. The most heavily frequented stretches were those around the agglomerations (Zurich, Basel and Bern; cf. table below). As before, the heaviest traffic volume was recorded in the region of Wallisellen, near Zurich. However, for this region no measurement data are available for 2018 due to the roadwork sites on the Zurich northern bypass. The average daily traffic volume (DTV) in the Baregg tunnel near Baden was 130,370 vehicles in 2018, a slight decline versus 2017 (−1.4 percent). Heavy vehicles accounted for 1.598 billion kilometres (5.8 percent) of the total accumulated distance. In recent years, the proportion accounted for by heavy vehicles has only increased very slightly (+0.4 percent).

In 2018, the duration of traffic jams on the motorways and national roads totalled 25,366 hours (−2.0 percent versus 2017). This was the first reduction since 2008 and was above all recorded in the major agglomerations. The decrease seen on the Zurich northern bypass (144,000 vehicles a day) is particularly interesting, where a large-scale road widening project is currently in progress. Here, the total duration of traffic jams (6,241 hours) nevertheless fell by 7.5 percent. This could possibly be attributable to the reduction of the speed limit to 80 km/h in the vicinity of the roadwork sites. According to traffic experts, reduced speed limits can lead to smoother traffic flow in stretches subject to congestion.

### Accumulated kilometres on the Swiss motorway/national roads network

<table>
<thead>
<tr>
<th>Year</th>
<th>Billion km</th>
<th>+/− (in %)</th>
<th>Heavy vehicles, billion km</th>
<th>+/− (in %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>25.170</td>
<td>–</td>
<td>1.506</td>
<td>–</td>
</tr>
<tr>
<td>2014</td>
<td>25.416</td>
<td>+1.0</td>
<td>1.543</td>
<td>+2.3</td>
</tr>
<tr>
<td>2015</td>
<td>26.484</td>
<td>+4.2</td>
<td>1.545</td>
<td>+0.2</td>
</tr>
<tr>
<td>2016</td>
<td>27.131</td>
<td>+2.4</td>
<td>1.567</td>
<td>+1.4</td>
</tr>
<tr>
<td>2017</td>
<td>27.680</td>
<td>+2.0</td>
<td>1.591</td>
<td>+1.6</td>
</tr>
<tr>
<td>2018</td>
<td>27.696</td>
<td>+0.1</td>
<td>1.598</td>
<td>+0.4</td>
</tr>
</tbody>
</table>

### Number of traffic jam hours on Switzerland’s motorway/national roads network

<table>
<thead>
<tr>
<th>Causes</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>+/− (in %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Congestion</td>
<td>21,211</td>
<td>22,949</td>
<td>22,110</td>
<td>+8 / −4</td>
</tr>
<tr>
<td>Accidents</td>
<td>2,420</td>
<td>2,504</td>
<td>2,597</td>
<td>+3 / +4</td>
</tr>
<tr>
<td>Roadworks</td>
<td>356</td>
<td>236</td>
<td>393</td>
<td>−38 / +67</td>
</tr>
<tr>
<td>Other</td>
<td>79</td>
<td>167</td>
<td>266</td>
<td>+111 / +59</td>
</tr>
<tr>
<td>Total</td>
<td>24,066</td>
<td>25,842</td>
<td>25,366</td>
<td>+7 / −2</td>
</tr>
</tbody>
</table>

### Highest daily traffic volume (no. of vehicles per day)

<table>
<thead>
<tr>
<th>Causes</th>
<th>2017</th>
<th>2018</th>
<th>+/− (in %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZH Wallisellen (A1)*</td>
<td>–</td>
<td>144,812</td>
<td>–</td>
</tr>
<tr>
<td>AG Neuenhof (A1)</td>
<td>131,447</td>
<td>132,446</td>
<td>+0.8%</td>
</tr>
<tr>
<td>AG Baden, Baregg tunnel (A1)</td>
<td>132,194</td>
<td>130,370</td>
<td>−1.4%</td>
</tr>
<tr>
<td>BL Muttenz, Hard (A2)</td>
<td>130,867</td>
<td>129,505</td>
<td>−1.0%</td>
</tr>
<tr>
<td>BS Basel, Gellert North (A2)**</td>
<td>–</td>
<td>129,500</td>
<td>–</td>
</tr>
<tr>
<td>AG Würenlos (A1)</td>
<td>127,108</td>
<td>128,670</td>
<td>+1.2%</td>
</tr>
<tr>
<td>BE Schönbühl, Grauholz (A6)</td>
<td>110,414</td>
<td>111,297</td>
<td>+0.8%</td>
</tr>
<tr>
<td>ZH Zurich northern bypass, Seebach (A1)*</td>
<td>–</td>
<td>109,585</td>
<td>–</td>
</tr>
<tr>
<td>ZH Weiningen, Gubrist (A1)**</td>
<td>–</td>
<td>108,630</td>
<td>–</td>
</tr>
<tr>
<td>ZH Zurich northern bypass, Affoltern (A1)**</td>
<td>–</td>
<td>107,408</td>
<td>–</td>
</tr>
<tr>
<td>Elsewhere</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VD Lausanne</td>
<td>107,281</td>
<td>106,588</td>
<td>−0.6%</td>
</tr>
<tr>
<td>GE Geneva**</td>
<td>–</td>
<td>75,000</td>
<td>–</td>
</tr>
<tr>
<td>TI Lugano</td>
<td>74,264</td>
<td>73,815</td>
<td>−0.6%</td>
</tr>
</tbody>
</table>

No (or only estimated) figures or percentages due to roadwork sites (*) or technical maintenance (**) of equipment.

---

**DTV 2015**  **DTV 2014**
Map of traffic volume on the motorway network

Source: geodata © swisstopo
The measuring stations indicate the average daily traffic volume, i.e. the mean figure calculated from all the 24-hour traffic volume figures measured for every day of the year.

**Roads in operation**

**Roads under construction or in the planning stage**

**Daily traffic volume and traffic increase (versus the previous year, in %)**

**Daily traffic volume and traffic decrease (versus the previous year, in %)**

**Daily traffic volume – no figures for previous year**

Figures shown in the map are in hundreds (e.g. 12 = 1,200)
## 49,493 more motor vehicles on Switzerland’s roads

### 2018 inventory of motor vehicles in Switzerland

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total</strong></td>
<td>6,102,751</td>
<td>6,053,258</td>
<td>0.82%</td>
<td>4,602,688</td>
<td>3,114,726</td>
<td>1,374,246</td>
<td>79,737</td>
<td>11,038</td>
</tr>
<tr>
<td>Lake Geneva region</td>
<td>1,124,090</td>
<td>1,117,546</td>
<td>0.59%</td>
<td>857,938</td>
<td>598,891</td>
<td>237,080</td>
<td>16,071</td>
<td>1,702</td>
</tr>
<tr>
<td>Vaud</td>
<td>534,214</td>
<td>528,486</td>
<td>1.08%</td>
<td>417,188</td>
<td>287,554</td>
<td>118,307</td>
<td>8,500</td>
<td>1,221</td>
</tr>
<tr>
<td>Valais</td>
<td>287,039</td>
<td>285,841</td>
<td>0.42%</td>
<td>220,259</td>
<td>149,885</td>
<td>66,802</td>
<td>2,442</td>
<td>192</td>
</tr>
<tr>
<td>Geneva</td>
<td>302,837</td>
<td>303,219</td>
<td>−0.13%</td>
<td>220,491</td>
<td>161,452</td>
<td>52,699</td>
<td>5,129</td>
<td>289</td>
</tr>
<tr>
<td><strong>Central plateau</strong></td>
<td>1,367,147</td>
<td>1,363,935</td>
<td>0.24%</td>
<td>1,019,443</td>
<td>706,735</td>
<td>290,962</td>
<td>15,442</td>
<td>2,365</td>
</tr>
<tr>
<td>Bern</td>
<td>741,387</td>
<td>742,794</td>
<td>−0.19%</td>
<td>535,407</td>
<td>363,323</td>
<td>160,368</td>
<td>8,005</td>
<td>1,472</td>
</tr>
<tr>
<td>Fribourg</td>
<td>241,353</td>
<td>237,578</td>
<td>1.59%</td>
<td>186,371</td>
<td>130,949</td>
<td>50,989</td>
<td>3,525</td>
<td>252</td>
</tr>
<tr>
<td>Solothurn</td>
<td>204,343</td>
<td>203,796</td>
<td>0.27%</td>
<td>157,261</td>
<td>110,556</td>
<td>43,741</td>
<td>1,937</td>
<td>388</td>
</tr>
<tr>
<td>Neuchâtel</td>
<td>123,363</td>
<td>122,894</td>
<td>0.38%</td>
<td>96,989</td>
<td>69,749</td>
<td>25,419</td>
<td>1,388</td>
<td>151</td>
</tr>
<tr>
<td>Jura</td>
<td>56,701</td>
<td>56,873</td>
<td>−0.30%</td>
<td>43,415</td>
<td>32,158</td>
<td>10,445</td>
<td>587</td>
<td>102</td>
</tr>
<tr>
<td><strong>Northwest Switzerland</strong></td>
<td>791,447</td>
<td>783,116</td>
<td>1.06%</td>
<td>1,350,317</td>
<td>904,815</td>
<td>406,746</td>
<td>26,125</td>
<td>3,920</td>
</tr>
<tr>
<td>Basel-Stadt</td>
<td>87,096</td>
<td>86,113</td>
<td>1.14%</td>
<td>66,159</td>
<td>43,366</td>
<td>20,919</td>
<td>1,195</td>
<td>353</td>
</tr>
<tr>
<td>Basel-Landschaft</td>
<td>192,646</td>
<td>191,895</td>
<td>0.39%</td>
<td>148,410</td>
<td>103,092</td>
<td>41,504</td>
<td>2,551</td>
<td>466</td>
</tr>
<tr>
<td>Aargau</td>
<td>511,705</td>
<td>505,108</td>
<td>1.31%</td>
<td>395,038</td>
<td>269,658</td>
<td>115,421</td>
<td>7,020</td>
<td>1,018</td>
</tr>
<tr>
<td><strong>Zurich</strong></td>
<td>953,681</td>
<td>947,068</td>
<td>0.70%</td>
<td>740,710</td>
<td>488,699</td>
<td>228,902</td>
<td>15,359</td>
<td>2,083</td>
</tr>
<tr>
<td><strong>Eastern Switzerland</strong></td>
<td>925,901</td>
<td>910,770</td>
<td>1.66%</td>
<td>677,947</td>
<td>446,570</td>
<td>217,681</td>
<td>9,072</td>
<td>1,407</td>
</tr>
<tr>
<td>Glarus</td>
<td>32,178</td>
<td>31,522</td>
<td>2.08%</td>
<td>23,657</td>
<td>15,387</td>
<td>7,850</td>
<td>270</td>
<td>55</td>
</tr>
<tr>
<td>Schaffhausen</td>
<td>62,418</td>
<td>62,026</td>
<td>0.63%</td>
<td>45,710</td>
<td>31,358</td>
<td>13,291</td>
<td>658</td>
<td>145</td>
</tr>
<tr>
<td>Appenzell AR</td>
<td>43,421</td>
<td>43,378</td>
<td>0.10%</td>
<td>32,009</td>
<td>21,581</td>
<td>9,788</td>
<td>416</td>
<td>49</td>
</tr>
<tr>
<td>Appenzell IR</td>
<td>19,232</td>
<td>13,978</td>
<td>37.59%</td>
<td>9,736</td>
<td>6,499</td>
<td>3,054</td>
<td>116</td>
<td>6</td>
</tr>
<tr>
<td>St Gallen</td>
<td>374,758</td>
<td>372,121</td>
<td>0.71%</td>
<td>280,720</td>
<td>184,135</td>
<td>90,737</td>
<td>3,919</td>
<td>624</td>
</tr>
<tr>
<td>Grisons</td>
<td>159,228</td>
<td>157,002</td>
<td>1.42%</td>
<td>113,300</td>
<td>67,800</td>
<td>43,768</td>
<td>1,151</td>
<td>111</td>
</tr>
<tr>
<td>Thurgau</td>
<td>234,666</td>
<td>230,743</td>
<td>1.70%</td>
<td>172,815</td>
<td>119,810</td>
<td>49,193</td>
<td>2,542</td>
<td>417</td>
</tr>
<tr>
<td><strong>Central Switzerland</strong></td>
<td>633,089</td>
<td>623,862</td>
<td>1.48%</td>
<td>472,377</td>
<td>307,825</td>
<td>152,892</td>
<td>7,844</td>
<td>1,025</td>
</tr>
<tr>
<td>Lucerne</td>
<td>294,821</td>
<td>295,829</td>
<td>−0.34%</td>
<td>216,386</td>
<td>144,544</td>
<td>66,735</td>
<td>3,535</td>
<td>463</td>
</tr>
<tr>
<td>Uri</td>
<td>28,801</td>
<td>27,219</td>
<td>5.81%</td>
<td>20,016</td>
<td>12,828</td>
<td>6,953</td>
<td>174</td>
<td>12</td>
</tr>
<tr>
<td>Schwyz</td>
<td>132,854</td>
<td>131,953</td>
<td>0.68%</td>
<td>101,436</td>
<td>68,625</td>
<td>30,485</td>
<td>1,578</td>
<td>157</td>
</tr>
<tr>
<td>Obwalden</td>
<td>31,877</td>
<td>31,518</td>
<td>1.14%</td>
<td>22,624</td>
<td>14,448</td>
<td>7,656</td>
<td>359</td>
<td>29</td>
</tr>
<tr>
<td>Nidwalden</td>
<td>36,121</td>
<td>35,444</td>
<td>1.91%</td>
<td>26,892</td>
<td>17,856</td>
<td>8,363</td>
<td>493</td>
<td>31</td>
</tr>
<tr>
<td>Zug</td>
<td>108,615</td>
<td>101,899</td>
<td>6.59%</td>
<td>85,023</td>
<td>49,524</td>
<td>32,700</td>
<td>1,705</td>
<td>333</td>
</tr>
<tr>
<td>Ticino</td>
<td>307,396</td>
<td>306,961</td>
<td>0.14%</td>
<td>224,666</td>
<td>149,890</td>
<td>68,157</td>
<td>5,183</td>
<td>619</td>
</tr>
</tbody>
</table>

Although the number of newly registered vehicles fell in 2018, the total inventory of motorised road vehicles increased again by 49,493, or 1 percent versus 2017. This means that the total figure has increased by 33 percent since 2000, i.e. the number of newly registered vehicles continues to exceed that of vehicles taken out of circulation. As of end of 2018, 6,102,751 vehicles were registered in Switzerland. Three-quarters of these were passenger cars, the number of which rose by 0.7 percent to 4,602,688.
A total of 395,413 newly registered motorised road vehicles were recorded in 2018 (17,414 or 4.2 percent fewer than in 2017). A reduction was first noted in 2016, but it intensified in 2018.
### 4.5 percent fewer new cars than in the previous year

**New registration of motor cars**

<table>
<thead>
<tr>
<th></th>
<th>2008</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>287,971</td>
<td>304,083</td>
<td>327,143</td>
<td>319,331</td>
<td>315,032</td>
<td>300,887</td>
</tr>
<tr>
<td><strong>Type</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Limousine</td>
<td>200,399</td>
<td>163,298</td>
<td>166,465</td>
<td>155,175</td>
<td>153,683</td>
<td>141,329</td>
</tr>
<tr>
<td>Station wagon</td>
<td>76,502</td>
<td>134,195</td>
<td>154,122</td>
<td>156,642</td>
<td>153,883</td>
<td>153,168</td>
</tr>
<tr>
<td>Convertible</td>
<td>11,070</td>
<td>6,590</td>
<td>6,556</td>
<td>7,514</td>
<td>7,511</td>
<td>6,390</td>
</tr>
<tr>
<td><strong>Engine capacity (cc)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Below 1,000</td>
<td>10,160</td>
<td>18,942</td>
<td>27,397</td>
<td>27,072</td>
<td>30,582</td>
<td>36,200</td>
</tr>
<tr>
<td>1,000–1,399</td>
<td>60,689</td>
<td>77,576</td>
<td>75,995</td>
<td>72,221</td>
<td>69,161</td>
<td>55,858</td>
</tr>
<tr>
<td>1,400–1,799</td>
<td>69,945</td>
<td>68,020</td>
<td>69,118</td>
<td>64,217</td>
<td>55,473</td>
<td>56,291</td>
</tr>
<tr>
<td>1,800–1,999</td>
<td>84,019</td>
<td>86,115</td>
<td>95,673</td>
<td>98,247</td>
<td>104,003</td>
<td>100,208</td>
</tr>
<tr>
<td>2,000–2,499</td>
<td>24,010</td>
<td>20,847</td>
<td>23,076</td>
<td>22,660</td>
<td>19,062</td>
<td>14,899</td>
</tr>
<tr>
<td>2,500–2,999</td>
<td>23,804</td>
<td>20,816</td>
<td>22,472</td>
<td>22,966</td>
<td>23,847</td>
<td>23,387</td>
</tr>
<tr>
<td>3,000 and over</td>
<td>15,320</td>
<td>9,819</td>
<td>9,530</td>
<td>8,423</td>
<td>7,975</td>
<td>8,633</td>
</tr>
<tr>
<td>Not specified</td>
<td>24</td>
<td>1,948</td>
<td>3,882</td>
<td>3,525</td>
<td>4,929</td>
<td>5,411</td>
</tr>
<tr>
<td><strong>Gear mechanism</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manual*</td>
<td>209,896</td>
<td>211,701</td>
<td>224,729</td>
<td>210,466</td>
<td>196,941</td>
<td>179,098</td>
</tr>
<tr>
<td>Automatic</td>
<td>69,641</td>
<td>73,709</td>
<td>84,352</td>
<td>90,496</td>
<td>98,955</td>
<td>103,055</td>
</tr>
<tr>
<td>Others**</td>
<td>8,434</td>
<td>18,673</td>
<td>18,062</td>
<td>18,369</td>
<td>19,136</td>
<td>18,734</td>
</tr>
<tr>
<td><strong>Fuel</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Petrol</td>
<td>189,151</td>
<td>180,875</td>
<td>185,469</td>
<td>178,666</td>
<td>183,637</td>
<td>188,847</td>
</tr>
<tr>
<td>Diesel</td>
<td>93,366</td>
<td>113,304</td>
<td>127,899</td>
<td>125,595</td>
<td>113,848</td>
<td>90,360</td>
</tr>
<tr>
<td>Petrol &amp; battery</td>
<td>3,091</td>
<td>6,155</td>
<td>7,676</td>
<td>9,494</td>
<td>11,564</td>
<td>14,563</td>
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<td>Diesel &amp; battery</td>
<td>1</td>
<td>728</td>
<td>1,099</td>
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<td>Electric drive</td>
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<td>3,525</td>
<td>4,929</td>
<td>5,411</td>
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<tr>
<td>Gas</td>
<td>1,136</td>
<td>1,041</td>
<td>1,080</td>
<td>944</td>
<td>769</td>
<td>805</td>
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<tr>
<td>Others</td>
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<td>28</td>
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<td>32</td>
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<tr>
<td><strong>Drive</strong></td>
<td></td>
<td></td>
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<tr>
<td>Front-wheel drive</td>
<td>193,942</td>
<td>171,513</td>
<td>177,723</td>
<td>162,519</td>
<td>151,015</td>
<td>142,069</td>
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<tr>
<td>Rear-wheel drive</td>
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<td>15,511</td>
<td>17,466</td>
<td>15,756</td>
<td>14,504</td>
<td>11,593</td>
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<tr>
<td>4×4</td>
<td>71,741</td>
<td>117,059</td>
<td>131,954</td>
<td>141,056</td>
<td>149,513</td>
<td>147,225</td>
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<tr>
<td><strong>Output (kilowatts)</strong></td>
<td></td>
<td></td>
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<tr>
<td>Below 60</td>
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<td>24,310</td>
<td>18,340</td>
<td>15,290</td>
<td>12,377</td>
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<td>61–80</td>
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<td>40,985</td>
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<td>36,342</td>
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<tr>
<td>81–100</td>
<td>43,067</td>
<td>56,189</td>
<td>65,552</td>
<td>68,241</td>
<td>62,412</td>
<td>58,301</td>
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<tr>
<td>101–120</td>
<td>68,710</td>
<td>67,705</td>
<td>63,049</td>
<td>61,483</td>
<td>57,802</td>
<td></td>
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<tr>
<td>121–140</td>
<td>29,030</td>
<td>53,137</td>
<td>56,166</td>
<td>60,050</td>
<td>58,530</td>
<td></td>
</tr>
<tr>
<td>141–200</td>
<td>34,809</td>
<td>40,105</td>
<td>41,808</td>
<td>42,297</td>
<td>40,910</td>
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<tr>
<td>200 and over</td>
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<td>28,682</td>
<td>30,737</td>
<td>33,950</td>
<td>36,621</td>
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<tr>
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<td>81</td>
<td>88</td>
<td>7</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td><strong>CO₂ emissions (g/km)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0–50 g</td>
<td>53</td>
<td>2,603</td>
<td>5,523</td>
<td>5,522</td>
<td>7,211</td>
<td>7,579</td>
</tr>
<tr>
<td>51–100 g</td>
<td>369</td>
<td>20,277</td>
<td>30,405</td>
<td>32,720</td>
<td>25,696</td>
<td>20,431</td>
</tr>
<tr>
<td>101–150 g</td>
<td>68,465</td>
<td>161,607</td>
<td>182,648</td>
<td>198,195</td>
<td>194,190</td>
<td>170,331</td>
</tr>
<tr>
<td>151–200 g</td>
<td>123,439</td>
<td>45,880</td>
<td>53,137</td>
<td>56,166</td>
<td>60,050</td>
<td>58,530</td>
</tr>
<tr>
<td>201–250 g</td>
<td>37,915</td>
<td>11,865</td>
<td>9,605</td>
<td>7,437</td>
<td>6,351</td>
<td>9,946</td>
</tr>
<tr>
<td>251–300 g</td>
<td>10,782</td>
<td>1,865</td>
<td>2,156</td>
<td>2,791</td>
<td>2,567</td>
<td>3,344</td>
</tr>
<tr>
<td>301+ g</td>
<td>3,114</td>
<td>1,054</td>
<td>575</td>
<td>813</td>
<td>805</td>
<td>1,039</td>
</tr>
</tbody>
</table>

* Includes dual clutch transmission and automatic transmission, ** For example, infinitely variable transmission

Source: Swiss Federal Statistical Office

---

Passenger cars represent the largest category of motorised road vehicles. In this category a total of 300,887 new registrations were recorded in 2018 (14,145 or 4.5 percent fewer than in 2017). Diesel models accounted for the sharpest decline (−20.6 percent). By contrast, the number of newly registered petrol-driven vehicles increased (+2.8 percent), as did registrations of hybrid and electric vehicles (+30.3 and +9.8 percent respectively).

---

### No. of new vehicles put into circulation (all types)

<table>
<thead>
<tr>
<th></th>
<th>2008</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cars</td>
<td>287,971</td>
<td>300,887</td>
</tr>
<tr>
<td>Passenger transport vehicles</td>
<td>3,224</td>
<td>5,611</td>
</tr>
<tr>
<td>Goods vehicles</td>
<td>29,706</td>
<td>37,538</td>
</tr>
<tr>
<td>Utility vehicles</td>
<td>24,491</td>
<td>22,941</td>
</tr>
<tr>
<td>HGVs</td>
<td>3,598</td>
<td>3,331</td>
</tr>
<tr>
<td>Articulated vehicles</td>
<td>14</td>
<td>11</td>
</tr>
<tr>
<td>Semi-trailers</td>
<td>1,603</td>
<td>1,255</td>
</tr>
<tr>
<td>Agricultural vehicles</td>
<td>3,227</td>
<td>2,930</td>
</tr>
<tr>
<td>Industrial vehicles</td>
<td>3,694</td>
<td>4,592</td>
</tr>
<tr>
<td>Motorcycles</td>
<td>48,774</td>
<td>43,855</td>
</tr>
<tr>
<td>Trailers</td>
<td>19,311</td>
<td>20,104</td>
</tr>
<tr>
<td>Total vehicles</td>
<td>395,907</td>
<td>415,517</td>
</tr>
<tr>
<td>Total motor vehicles</td>
<td>376,596</td>
<td>395,413</td>
</tr>
</tbody>
</table>

Source: Swiss Federal Statistical Office
Switzerland’s annual road accident statistics are based on the register of road accidents kept by FEDRO. In 2018, a total of 233 people were killed in road accidents in Switzerland. Of these, 79 died as a result of accidents involving a car, 42 involving a motorcycle, 27 involving a bicycle and 12 involving an e-bike. 43 pedestrians lost their lives. The number of people seriously injured in road accidents increased by 6 percent to 3,873.

A breakdown of these numbers gives the following picture.

**Passengers of private vehicles:** In 2018, there was 1 more fatality than in 2017. A total of 79 passengers of private vehicles were killed. The total number of passengers seriously injured was 797.

**Deaths on motorways and expressways:** Fewer people lost their lives in accidents on motorways and expressways in Switzerland than in 2017. Fatalities totalled 23, which was 9 fewer than in 2017.

**Pedestrians:** The number of fatalities on footpaths declined last year against 2017. The proportion of elderly victims of road accidents fell significantly. Outside pedestrian zones, by contrast, 9 more people were killed in 2018 than in 2017. A total of 537 pedestrians were seriously injured, 1 more than in 2017.

**Increase in fatal accidents involving e-bikes:** The picture for accidents involving two-wheeled vehicles is mixed. While there were fewer deaths in accidents involving motorcycles and bicycles – 9 fewer motorcyclists (42) and 3 fewer cyclists (27) – the number of fatalities involving e-bikes increased from 7 in 2017 to 12 in 2018. The numbers of seriously injured were higher in 2018: 1,068 motorcyclists (up 2 percent), 877 cyclists (up 7 percent) and 309 e-bikers (up 38 percent).

Serious accidents involving e-bikers reached a new high in 2018 with 321 casualties (serious injuries and fatalities). Of these, 236 people were riding a standard e-bike and 85 a high-speed e-bike. The increase of 45 to a total of 106 seriously injured people aged 65 and older was especially high in 2018 in comparison with 2017.
### All road accidents

<table>
<thead>
<tr>
<th>Year</th>
<th>Total no. of accidents</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>58,928</td>
</tr>
<tr>
<td>2011</td>
<td>54,269</td>
</tr>
<tr>
<td>2012</td>
<td>54,171</td>
</tr>
<tr>
<td>2013</td>
<td>53,052</td>
</tr>
<tr>
<td>2014</td>
<td>51,756</td>
</tr>
<tr>
<td>2015</td>
<td>53,235</td>
</tr>
<tr>
<td>2016</td>
<td>55,053</td>
</tr>
<tr>
<td>2017</td>
<td>56,112</td>
</tr>
<tr>
<td>2018</td>
<td>54,378</td>
</tr>
</tbody>
</table>

### Accidents resulting in fatalities/injuries

<table>
<thead>
<tr>
<th></th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fatalities</td>
<td>219</td>
<td>228</td>
</tr>
<tr>
<td>Serious injuries</td>
<td>3,427</td>
<td>3,640</td>
</tr>
<tr>
<td>life-threatening injuries</td>
<td>180</td>
<td>148</td>
</tr>
<tr>
<td>Severe injuries</td>
<td>3,247</td>
<td>3,492</td>
</tr>
<tr>
<td>Minor injuries</td>
<td>14,153</td>
<td>14,165</td>
</tr>
<tr>
<td>Total</td>
<td>17,799</td>
<td>18,033</td>
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### Serious injuries

<table>
<thead>
<tr>
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<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
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<td>By form of transport</td>
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<td></td>
</tr>
<tr>
<td>Cars</td>
<td>781</td>
<td>797</td>
</tr>
<tr>
<td>Passenger transport vehicles</td>
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<td>43</td>
</tr>
<tr>
<td>Goods transport vehicles</td>
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<td>45</td>
</tr>
<tr>
<td>Motorcycles</td>
<td>1,047</td>
<td>1,068</td>
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<tr>
<td>Motor scooters</td>
<td>67</td>
<td>71</td>
</tr>
<tr>
<td>Electric bikes</td>
<td>224</td>
<td>309</td>
</tr>
<tr>
<td>Bicycles</td>
<td>818</td>
<td>877</td>
</tr>
<tr>
<td>Pedestrians</td>
<td>536</td>
<td>537</td>
</tr>
<tr>
<td>on pedestrian crossings</td>
<td>235</td>
<td>257</td>
</tr>
<tr>
<td>elsewhere</td>
<td>301</td>
<td>280</td>
</tr>
<tr>
<td>Others</td>
<td>107</td>
<td>126</td>
</tr>
<tr>
<td>Total</td>
<td>3,654</td>
<td>3,873</td>
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<table>
<thead>
<tr>
<th></th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>By assumed main cause</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Influence of alcohol</td>
<td>309</td>
<td>332</td>
</tr>
<tr>
<td>Speeding</td>
<td>426</td>
<td>415</td>
</tr>
<tr>
<td>Inattention/distraction</td>
<td>532</td>
<td>528</td>
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<table>
<thead>
<tr>
<th></th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>By type of road</td>
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<td></td>
</tr>
<tr>
<td>Motorways and expressways</td>
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<td>235</td>
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### Fatalities

<table>
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<th>2018</th>
</tr>
</thead>
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<td>By form of transport</td>
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<td></td>
</tr>
<tr>
<td>Cars</td>
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<td>79</td>
</tr>
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<td>Passenger transport vehicles</td>
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<td>3</td>
</tr>
<tr>
<td>Goods transport vehicles</td>
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<td>4</td>
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<tr>
<td>Motorcycles</td>
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<td>42</td>
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<tr>
<td>Motor scooters</td>
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<td>Electric bikes</td>
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<tr>
<td>Bicycles</td>
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<td>27</td>
</tr>
<tr>
<td>Pedestrians</td>
<td>44</td>
<td>43</td>
</tr>
<tr>
<td>on pedestrian crossings</td>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td>elsewhere</td>
<td>24</td>
<td>33</td>
</tr>
<tr>
<td>Others</td>
<td>13</td>
<td>18</td>
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<tr>
<td>Total</td>
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<td>233</td>
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<table>
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<tr>
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<th>2017</th>
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</tr>
</thead>
<tbody>
<tr>
<td>By assumed main cause</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Influence of alcohol</td>
<td>30</td>
<td>24</td>
</tr>
<tr>
<td>Speeding</td>
<td>33</td>
<td>37</td>
</tr>
<tr>
<td>Inattention/distraction</td>
<td>19</td>
<td>19</td>
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<table>
<thead>
<tr>
<th></th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>By type of road</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motorways and expressways</td>
<td>32</td>
<td>23</td>
</tr>
</tbody>
</table>
Fewer licences confiscated in 2018

In 2018, approximately 80,000 drivers had their Swiss or foreign driving licence or learner’s licence confiscated. This number is almost 6 percent lower than last year. The main reasons for licence confiscations are speeding and driving under the influence of alcohol.

The statistics on FEDRO’s administrative measures (ADMAS) indicate that in 2018 the number of licence confiscations in Switzerland fell by 4,700 to 80,077 against the number for 2017. There were 1,304 cases where the driver’s provisional licence was cancelled (8 fewer than in 2017).

Licences were confiscated in 27,503 cases for speeding (down 3 percent on the previous year) and in 13,090 cases for drink driving (down 4 percent). These figures indicate a continuation in the downward trend in licence confiscations for speeding offences and drink driving.

In 2018, there were 4,661 cases of licence confiscations for driving while under the influence of drugs (8 percent fewer than in 2017). Confiscations owing to drug addiction (2,515 cases) were down 22 percent.

In addition to the 80,077 confiscations of Swiss driving licences in 2018, recognition of foreign driving licences was revoked in a further 19,747 cases (down 5 percent). The most common reason was speeding (9,903 foreign licences revoked).

5.9 million licences to drive a private car

In 2018, approximately 5.9 million people in Switzerland held a provisional or unrestricted licence to drive a private car (category B), i.e. approximately 62,000 individuals (or more than 1 percent) more than in the previous year. This increase is related to population growth, the number of new drivers, and the exchange of foreign driving licences for Swiss licences. Approximately 54 percent of licensed drivers are men and 46 percent women.
### Administrative measures

#### Reasons for withdrawal

<table>
<thead>
<tr>
<th>Reason for withdrawal</th>
<th>2018</th>
<th>+/- (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speeding offences</td>
<td>27,503</td>
<td>-3.3</td>
</tr>
<tr>
<td>Drink driving</td>
<td>13,090</td>
<td>-3.9</td>
</tr>
<tr>
<td>Inattention</td>
<td>7,760</td>
<td>-7.7</td>
</tr>
<tr>
<td>Failure to give way</td>
<td>4,223</td>
<td>-5.0</td>
</tr>
<tr>
<td>Failure to observe traffic signals</td>
<td>1,382</td>
<td>-0.1</td>
</tr>
<tr>
<td>Unlawful overtaking</td>
<td>1,677</td>
<td>-5.9</td>
</tr>
<tr>
<td>Other driving errors</td>
<td>4,887</td>
<td>-10.9</td>
</tr>
<tr>
<td>Alcohol addiction</td>
<td>1,279</td>
<td>-25.7</td>
</tr>
<tr>
<td>Influence of drugs</td>
<td>4,661</td>
<td>-7.6</td>
</tr>
<tr>
<td>Drug addiction</td>
<td>2,515</td>
<td>-22.0</td>
</tr>
<tr>
<td>Sickness or infirmity</td>
<td>5,716</td>
<td>-4.8</td>
</tr>
<tr>
<td>Other reasons</td>
<td>20,132</td>
<td>-8.8</td>
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</tbody>
</table>

#### Duration of withdrawal

<table>
<thead>
<tr>
<th>Duration</th>
<th>2018</th>
<th>+/- (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 month</td>
<td>31,108</td>
<td>-4.7</td>
</tr>
<tr>
<td>2 months</td>
<td>1,333</td>
<td>-24.4</td>
</tr>
<tr>
<td>3 months</td>
<td>15,854</td>
<td>+1.7</td>
</tr>
<tr>
<td>4–6 months</td>
<td>6,810</td>
<td>-5.1</td>
</tr>
<tr>
<td>7–12 months</td>
<td>2,251</td>
<td>-6.1</td>
</tr>
<tr>
<td>More than 12 months</td>
<td>984</td>
<td>-5.3</td>
</tr>
<tr>
<td>Indefinite period</td>
<td>21,718</td>
<td>-9.9</td>
</tr>
<tr>
<td>Permanent withdrawal</td>
<td>19</td>
<td>-5.0</td>
</tr>
</tbody>
</table>

* Change in percent versus 2017

### Age of persons affected

<table>
<thead>
<tr>
<th>Age range</th>
<th>2018</th>
<th>+/- (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 20</td>
<td>3,690</td>
<td>-8.5</td>
</tr>
<tr>
<td>20 to 24</td>
<td>10,300</td>
<td>-7.0</td>
</tr>
<tr>
<td>25 to 29</td>
<td>10,354</td>
<td>-4.6</td>
</tr>
<tr>
<td>30 to 34</td>
<td>9,116</td>
<td>-2.8</td>
</tr>
<tr>
<td>35 to 39</td>
<td>7,955</td>
<td>-5.6</td>
</tr>
<tr>
<td>40 to 49</td>
<td>13,414</td>
<td>-7.2</td>
</tr>
<tr>
<td>50 to 59</td>
<td>12,302</td>
<td>-2.6</td>
</tr>
<tr>
<td>60 to 69</td>
<td>5,860</td>
<td>-0.5</td>
</tr>
<tr>
<td>70 and over</td>
<td>7,446</td>
<td>-11.0</td>
</tr>
</tbody>
</table>

### Reasons for withdrawal or refusal of learner’s/driver’s licence

<table>
<thead>
<tr>
<th>Reason for withdrawal</th>
<th>2018</th>
<th>+/- (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learner driving unaccompanied</td>
<td>415</td>
<td>+2.2</td>
</tr>
<tr>
<td>Driving error</td>
<td>2,136</td>
<td>-3.2</td>
</tr>
<tr>
<td>Drink driving</td>
<td>627</td>
<td>+1.6</td>
</tr>
<tr>
<td>Driving without a licence</td>
<td>2,579</td>
<td>-0.7</td>
</tr>
<tr>
<td>Failure to pass driving test</td>
<td>205</td>
<td>-1.0</td>
</tr>
<tr>
<td>Driving despite withdrawal of licence</td>
<td>168</td>
<td>-2.3</td>
</tr>
<tr>
<td>Theft</td>
<td>386</td>
<td>+6.6</td>
</tr>
<tr>
<td>Sickness or infirmity</td>
<td>121</td>
<td>+4.3</td>
</tr>
<tr>
<td>Other reasons</td>
<td>1,798</td>
<td>-17.3</td>
</tr>
</tbody>
</table>

### Reasons for warnings

<table>
<thead>
<tr>
<th>Reason for warning</th>
<th>2018</th>
<th>+/- (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speeding</td>
<td>41,173</td>
<td>-2.2</td>
</tr>
<tr>
<td>Drink driving (&gt; = 0.050 to 0.079%)</td>
<td>4,778</td>
<td>-8.8</td>
</tr>
<tr>
<td>Inattention</td>
<td>3,284</td>
<td>-1.5</td>
</tr>
<tr>
<td>Failure to give way</td>
<td>2,031</td>
<td>+0.5</td>
</tr>
<tr>
<td>Driving an unroadworthy vehicle</td>
<td>2,114</td>
<td>-4.6</td>
</tr>
<tr>
<td>Failure to observe traffic signals</td>
<td>1,024</td>
<td>+0.9</td>
</tr>
<tr>
<td>Unlawful overtaking</td>
<td>298</td>
<td>-11.3</td>
</tr>
<tr>
<td>Other reasons</td>
<td>7,465</td>
<td>-3.3</td>
</tr>
</tbody>
</table>

* Change in percent versus 2017

---

**Withdrawn driving licences by age group**

- Under 20: 25.8%
- 20 to 29: 15.4%
- 30 to 39: 4.6%
- 40 to 49: 20.9%
- 50 to 59: 16.7%
- 60 to 69: 7.3%
- 70 and over: 9.3%
Finance flows for the two road transport funds

The Fund for Financing Motorway and Agglomeration Traffic finances the motorways and major projects in the agglomerations. The Fund for the Special Financing of Road Transport primarily supports cantonal road transport infrastructure.

Expenditure for the motorways/national roads encompasses operation, maintenance, expansion, elimination of bottlenecks and completion of the network. All this expenditure is financed from the Fund for Financing Motorway and Agglomeration Traffic, which entered into effect on 1 January 2018. This move increases the degree of transparency, and also simplifies the short- and medium-term management of credit facilities.

Parliament decides how much may be withdrawn from the fund each year, which is not governed by the federal debt brake mechanism. The balance of any approved funding that is not utilised

Flows of funds in 2019 (in million Swiss francs) in accordance with 2019 budget

<table>
<thead>
<tr>
<th>Revenue</th>
<th>Oil tax</th>
<th>Oil tax surcharge</th>
<th>Motor vehicle tax</th>
<th>Motorway stickers</th>
<th>Electric vehicles*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2,680</td>
<td>1,772</td>
<td>440</td>
<td>354</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>45%</td>
<td>50%</td>
<td>5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ordinary federal budget</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Special financing of road transport (SFSV) New</td>
<td>1,340</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motorway and Agglomeration Fund** (MAF)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2,931</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Expenditure</th>
<th>Main roads</th>
<th>Motorways</th>
<th>Agglomeration programmes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Main roads: Mountains and outlying regions</td>
<td>Completion of the network</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Non-project-related contributions to cantons</td>
<td>Maintenance</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Non-project-related contributions</td>
<td>Expansion</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Environmental protection</td>
<td>Operation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conservation of landscapes</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Natural hazards</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Research and administration</td>
<td>Elimination of bottlenecks</td>
<td></td>
</tr>
</tbody>
</table>

* Date of introduction still open
** Including a portion of the reserves from the Special Fund for the Financing of Road Transport, plus various other sources of revenue.

Figures taken from the federal budget 2019. Amounts in the totals may differ due to rounding up or down of the individual figures.
remains in the fund. This increases its liquidity and the resources remain available for use at a later date. This fund gives rise to greater flexibility and transparency and increases the long-term planning and implementation certainty for FEDRO’s large-scale projects.

Composition of deposits:
- Oil tax surcharge (100 %)
- Motorway sticker (100 %)
- Vehicle tax (100%)
- Oil tax (currently 5%, as a rule 10 % as of 2020)
- Levy on electric vehicles (100 % – date of introduction as yet unspecified)

Due to rounded up or down figures, minor differences may arise in the totals.

### Deposits into the Fund for Financing Motorway and Agglomeration Traffic as of 2018 (in million Swiss francs)

<table>
<thead>
<tr>
<th></th>
<th>2016 C*</th>
<th>2017 C*</th>
<th>2018 C*</th>
<th>2019 B**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil tax surcharge</td>
<td>–</td>
<td>–</td>
<td>1,792</td>
<td>1,772</td>
</tr>
<tr>
<td>Vehicle tax</td>
<td>–</td>
<td>–</td>
<td>398</td>
<td>440</td>
</tr>
<tr>
<td>Motorway levy</td>
<td>–</td>
<td>–</td>
<td>349</td>
<td>354</td>
</tr>
<tr>
<td>CO₂ reduction (passenger cars)</td>
<td>–</td>
<td>–</td>
<td>11</td>
<td>1</td>
</tr>
<tr>
<td>Oil tax (5%)</td>
<td>–</td>
<td>–</td>
<td>135</td>
<td>134</td>
</tr>
<tr>
<td>Temporary deposit from reserve (Special Fund for the Financing of Road Transport)</td>
<td>–</td>
<td>–</td>
<td>475</td>
<td>183</td>
</tr>
<tr>
<td>Revenue from third-party funding</td>
<td>–</td>
<td>–</td>
<td>36</td>
<td>47</td>
</tr>
<tr>
<td>Management income</td>
<td>–</td>
<td>–</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total deposits</strong></td>
<td>–</td>
<td>–</td>
<td>3,206</td>
<td>2,931</td>
</tr>
</tbody>
</table>

### Withdrawals from the Infrastructure Fund (2016–2017, in million Swiss francs)
(as of 2018, from the Fund for Financing Motorway and Agglomeration Traffic)

<table>
<thead>
<tr>
<th></th>
<th>2016 C*</th>
<th>2017 C*</th>
<th>2018 C*</th>
<th>2019 B**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operation of motorways/national roads</td>
<td>–</td>
<td>–</td>
<td>362</td>
<td>378</td>
</tr>
<tr>
<td>Expansion and maintenance of motorways/national roads</td>
<td>–</td>
<td>–</td>
<td>1,501</td>
<td>1,572</td>
</tr>
<tr>
<td>Completion of motorway/national roads network</td>
<td>384</td>
<td>254</td>
<td>190</td>
<td>260</td>
</tr>
<tr>
<td>Elimination of bottlenecks</td>
<td>131</td>
<td>180</td>
<td>168</td>
<td>210</td>
</tr>
<tr>
<td>Contributions towards transport infrastructure in urban centres</td>
<td>211</td>
<td>147</td>
<td>150</td>
<td>338</td>
</tr>
<tr>
<td>Contributions for main roads in mountainous and outlying regions</td>
<td>47</td>
<td>48</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td><strong>Total withdrawals/expenditure</strong></td>
<td><strong>773</strong></td>
<td><strong>629</strong></td>
<td><strong>2,371</strong></td>
<td><strong>2,758</strong></td>
</tr>
</tbody>
</table>

* Charged
** Budgeted

Due to rounded up or down figures, minor differences may arise in the totals.

**Special Fund for the Financing of Road Transport: all transfer payments from a single source**

This fund is the single source for all transfer payments in the road transport sector at the federal level, as well as for the administrative and research costs of FEDRO. It is financed from half the revenue from the oil tax and, where necessary, from vehicle tax revenue. As before, it is managed via the ordinary federal budget.
Organisational chart of the Federal Roads Office (FEDRO)

Valid from 1 May 2019
Addresses of FEDRO and regional units

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Phone 058 462 94 11
Fax 058 463 23 03
info@astra.admin.ch

Postal address
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www.astra.admin.ch
www.swiss-motorways.ch
www.asta.admin.ch/traffic-data
www.accident-statistics.ch
www.truckinfo.ch

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National traffic management centre
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Motorway maintenance

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Regional Unit II
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1014 Lausanne

Regional Unit III
(canton of Valais, Vaud)
Route des iles 8
1950 Sitten

Regional Unit IV
(canton of Ticino)
Divisione delle costruzioni
Area dell’esercizio della manutenzione
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6501 Bellinzona

Regional Unit V
(canton of Grisons)
Grisons Civil Engineering
Grabenstrasse 30
7001 Chur

Regional Unit VI
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9016 St. Gallen

Regional Unit VII
(canton of Zurich, Schaffhausen)
Motorway Maintenance Department, Canton of Zurich
Werkhofstrasse 1
8902 Urdorf

Regional Unit VIII
(canton of Basel-Stadt, Basel-Landschaft, Solothurn, Aargau)
NSNW AG
Northwest Switzerland Motorways
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2001 Neuchâtel

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zentras
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6020 Emmenbrücke

Regional Unit XI
(canton of Uri, Schwyz, Ticino)
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www.astra.admin.ch/regional-units
Cantonal police headquarters

AG Polizeikommando
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GR Kantonspolizei Graubünden
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NW Kantonspolizei Nidwalden
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TG Kantonspolizei Thurgau
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www.ur.ch/kapo

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ZG Zuger Polizei
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www.strassenverkehrsamt.lu.ch

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Layout