SMART MOBILITY SOLUTIONS

PRODUCT CATALOGUE



ARTIFICIAL INTELLIGENCE BY SWISSTRAFFIC GROUP

AI:	Artificial Intelligence
ANPR:	Automatic number plate recognition
API:	Application Programming Interface; interface for automatic
	data transmission from sensor to a server in real-time
D:	Days
GDPR:	EU General Data Protection Regulation
GSM:	Global System for Mobile Communications; fully digital mobile
	communications network
IMT:	Individual motorised traffic
loT:	Internet of Things
LoRa:	Long Range Wide Area; enables energy-efficient data transmission over
	long distances without LTE (see also SIGFOX)
LTE:	Long Term Evolution; a mobile communications standard for 4G, 5G etc
NMT:	Non-motorised traffic, cyclists and pedestrians
MTH:	Months
Multimodal:	Use of different transport modes during a certain period
o-d:	origin-destination
PT:	Public transport
SIGFOX:	Proprietary global communications network for low-energy wireless
	connection of objects to the internet (see also LoRa)
WK:	Weeks

	Public transport (PT)			
$\overline{\mathbb{A}}$	Safety			
LED	LED display			
$\overline{\mathbf{O}}$	Violations			
P	Parking			
R	Services			
ณ์	Dashboard			
AI	Artificial Intelligence			
()	Data protection compliant			
	Mobile installation			
	Fixed counting station			
术	Pedestrian			
+	e-Scooter			
Ō	Cyclist			
Ġ	Wheel chair			

Stroller

÷	
	Tram
~	Tractor
6	Motorcycle
	Car
	Car with trailer
<u> </u>	Bus, coach
	Van
	Van with trailer
<u>, </u>	Articulated van
	Lorry
	Lorry with trailer
	Articulated lorry



The future of mobility is defined by seamlessly meshing of our work life, home life and leisure time. Just getting from A to B will no longer be enough. What will truly matter in a multi-mobile world are: experience, sustainability and health.

At SWISSTRAFFIC, we believe that mobility is one of the key areas affecting sustainability. All over the world, new products and services are evolving faster and faster, opening up a seemingly endless range of possibilities. But companies, governments, cities and other actors must still draw the right conclusions. Our aim is to support customers and to apply an integral approach to addressing this highly complex issue.

With over 20 years of expertise in mobility, we are your partner for innovative and sustainable mobility solutions.

Alain Bützberger

Chairman of the Board SWISSTRAFFIC Group

WELCOME

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SWISSLASER Logs individual motorised traffic across 2 lanes, also during congestion 22

events and in parks etc.

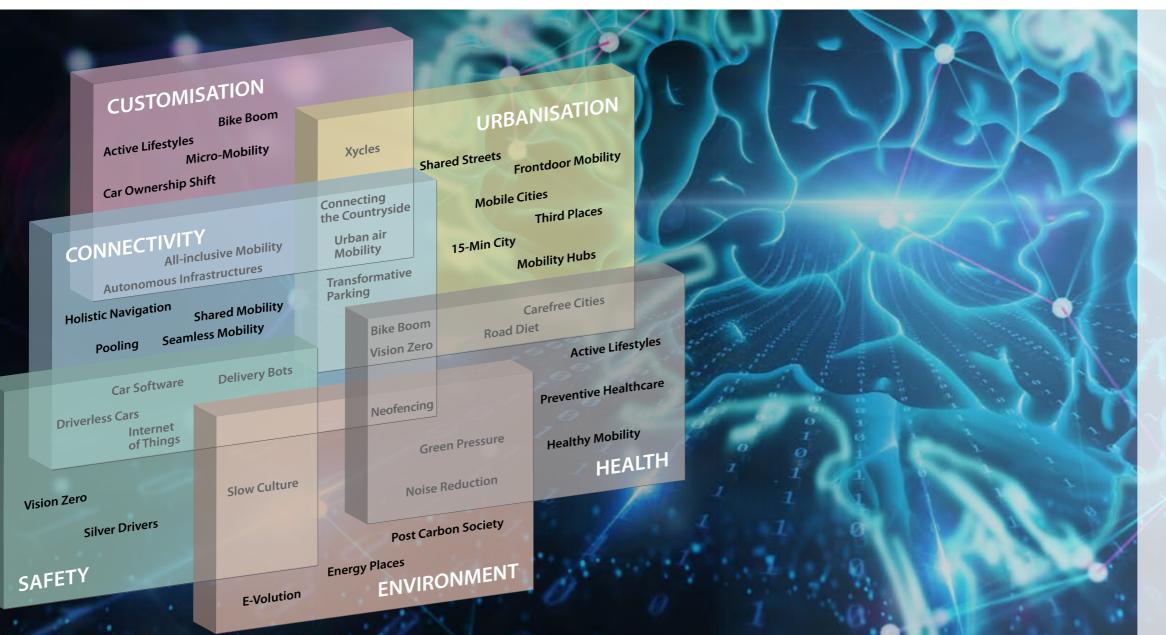
e non motorisés

and API

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SMART MOBILITY VISION - HUMAN-CENTERED



THE FUTURE OF MOBILITY

People are longing for peace of mind. Quality of life is becoming an increasingly precious commodity. Cities should be clean, green and quiet.

Experience is now more important than possession. Flexible access to an array of mobility options is the name of the game. Reality is shaped by diversity instead of routine. Seamless mobility blends personal and public concepts.

Autonomous driving is transforming the role that cars play. Driverless concepts reduce the need for parking spaces, expanding time spent in the car.

Cars are increasingly withdrawing from the cities. Bicycles will shape the future of mobility more and more.

VISION

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APPLICATION AF	REA	PRODUCT
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1	Interactive online display of results in real-time, with predictions	48 - swissDASHBOARD

TOPICS



AI SWISSTRAFFIC AI AI-based fixed installation for multin



Al-based fixed installation for multimodal counting in real-time. Use of existing camera infrastructure, if installed. swissTRAFFIC AI complies 100% with GDPR data protection requirements.

CLOUD SOLUTION

Customer can install the camera. Dual use as a safety camera. Outstanding accuracy, even for congested objects in urban environments.

Easy use of already existing cameras possible. Encrypted data transmission and analysis in the cloud. API available.

BOX SOLUTION

Additional hardware box is installed directly with the camera. Data transmission possible via GSM or LoRa. Easy use of current cameras possible. On-site data analysis. API available.

SERVER SOLUTION

Installation of a server with pre-installed software directly at the customer's site - connection of the server to the customer's cameras on site - access by video surveillance is not aff ected. Data processing by customer or API.

IDEAL APPLICATION
 AREAS

Counting IMT, cyclists, e-scooter, persons, wheel chairs, strollers Traffic signal optimisation Cyclist behaviour Nodal flow analyses Traffic flow Transfer relationships Analyses of near-accidents Impact analyses



Multimodal
14 object classes
Accurate lane tracking
Real-time data
Congestion-resilient
Speeds
Simple installation
GSM or LoRa
Parking

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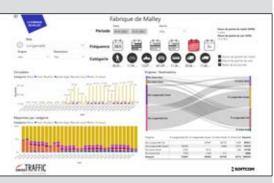




Automatic detection of traffi c fl ow for all moving objects without storing video or image data.



Intelligent parking: Detection of car park occupancy and calculation of parking time.



Data visualisation in a neatly arranged dashboard with separate customer portal.



AI SWISS AI-based de

| swissSAFETY AI

Al-based detection of violations and misconduct in road traffic. Improved safety for the most vulnerable transport users – pedestrians and cyclists. Can be connected to police caution or fine correspondence.



Improving safety, preventing accidentsSafety on school routesFailure to give way atpedestrian crossingsCyclist behaviour at roundaboutsDetection of near-accidentsDisregard of stop signalsUnauthorised parkingWrong lane or direction of travel



Fixed or mobile counting station
Autonomous for up to 7 days if mobile
Counting IMT, cyclists, persons
Speeds
Can be connected to an LED display
for awareness raising
Accurate lane tracking
Real-time data
Floating car data



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IMPROVED SAFETY AT PEDESTRIAN CROSSINGS ALONG SCHOOL ROUTES

Al- and radar-based system to improve safety by the automatic detection of pedestrian crossings and failure to give way. Signals with special interior lighting and yellow strips attached to the poles can light up immediately during use of the pedestrian crossing to improve visibility, especially at night.

In addition to flashing, an alarm sound can also be emitted in potential "pedestrian-driver" conflict situations or if pedestrians are inattentive (staring at their phones). In case of violations, a brief video sequence can optionally be stored in the system to help with police investigations. As a fixed or mobile installation.

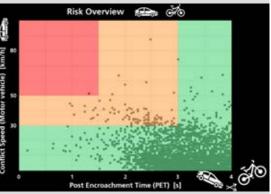
PREVENTING ACCIDENTS

Al technology to analyse trajectories and speeds for the detection of near-accidents at intersections involving pedestrians, cyclists and vehicles or to analyse cyclist behaviour at roundabouts. As a fixed or mobile installation.

AWARENESS RAISING IN THE EVENT OF VIOLATIONS

Downstream installation of LED displays, can sensitise transport users to their misconduct in real-time as a contribution to targeted improvement of road safety.





Evaluation of dangerous situations (near-collisions) with our risk matrice.



Pedestrians are inattentive and perceive dangers too late.



Real-time automatic detection of right-of-way violations at pedestrian crossings and warning of road users.

SAFETY



| swissSCOUT AI

The mobile camera system for multimodal counting is 100% compliant with the GDPR thanks to integrated AI and allows autonomy of up to 7 days. The data is analysed in real-time.



Counting IMT, cyclists, persons, e-scooters Counting tourists, hikers Cyclist behaviour Nodal flow analyses Parking with origins Impact analyses Safety analyses



Multimodal
Mobile solution with up to 7 days
of round-the-clock autonomy
Real-time data
Speeds
Accurate lane tracking
Congestion-resilient
Simple installation
12 object classes



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AI REVOLUTION IN MOBILE TRAFFIC DATA COLLECTION

swissSCOUT AI is revolutionising mobile traffic data collection. The integrated AI software enables onsite multimodal traffic analysis in real-time, without having to save videos or images. The analysed data is uploaded directly to the cloud, where it is then available for visualisation on the swissDASHBOARD.

swissSCOUT AI is the first mobile traffic data collection system with full GDPR compliance.

Please check the swissSCOUT website for further information: www.swissscout.com





Mobile camera system with integrated Al analysis software for real-time evaluations and presentation on a proprietary dashboard.



Swiss quality. Hardware and software from a single source.





swissBIKE+PED CROWD

Simultaneously counts cyclists and pedestrians in all directions on paths with a width of up to 4 metres. Combinable with an LED display. Counts also e-scooters.



Counting cyclists, persons Counting tourists, hikers Counting e-scooters



Laser technology LED display Solar fixed counting station Accurate lane tracking Real-time data Proprietary dashboard



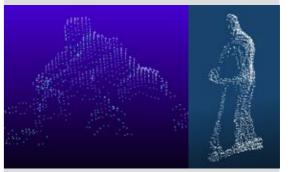
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SOPHISTICATED LASER TECHNOLOGY

The sensor uses a "laser curtain" that is defined during installation to log the cross section in a sequence of consecutive scans (every 16 ms). The laser uses this information to generate a 3D image that is analysed by the algorithms to determine the correct classification. The system accurately registers the direction of travel by detecting which of the 4 laser planes the cyclist, e-scooter or pedestrian reaches first.

The sensor is equipped with a CPU. All signals from the laser scanner are processed directly. A 4G modem is also installed in the laser to transmit text data (no images) to a server in real-time.

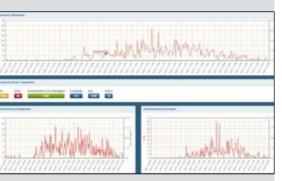




A cloud of points indicating a bicycle and an e-Scooter. The sensor software is able to distinguish cyclists, e-scooters and pedestrians.



A typical system for counting bicycles consists of a laser scanner and an LED display.



swissBIKE+PED CROWD has a neatly arranged, proprietary dashboard.



| swissANPR AI

swissANPR AI is a highly sophisticated ANPR camera line with optional modules for onboard plate recognition and laser-sharp vehicle detection.

Smart-enabled swissANPR AI models are capable of running onboard ANPR with superior accuracy, along with vehicle make, model and color recognition, in order to quickly gather vehicle identification information on the spot. Each unit is protected inside a compact and robotically assembled IP67 rated weatherproof housing to ensure impressive performance in all environments from the arctic cold to the desert heat.

Integrated illumination and advanced brightness control work together to capture clearly visible high-contrast images of both reflective and non-reflective plates. Also good news for our ITS customers is that swissANPR AI is natively GDS-ready.

Main benefits

- SWISSANPR AI can work as a standalone traffic solution
- ANPR and Make and Model Recognition runs on-board (optional)
- Built-in synchronized illumination for superior imaging at any traffic speed
- Variable motorized optics for easy finetuning
- Built-in laser trigger for precise vehicle detection
- 150% faster OCR recognition than in the previous models
- High-quality automated manufacturing using robotic assembly
- ADR = Dangerous goods recognition



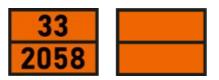
Destination, origin and transit traffic Rat-running traffic Travel times and routes Proportion of electric, hybrid, petrol or diesel vehicles Hazardous goods transports Segmental speeds Traffic models and scenarios



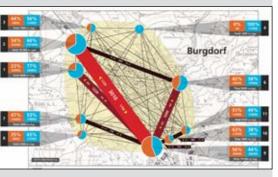
Fixed or mobile counting station
Autonomous for 5 days if mobile
LED display
Accurate lane tracking
Real-time data
Congestion-resilient
Origins: country/canton/town
SWISS10 (10 vehicle classes)



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Graphical visualisation of the origin, destination and transit traffic through a city, municipality or neighbourhood with different vehicle types.



Identification of the share of electric, hybrid, diesel, petrol vehicles and their origins (country, canton, town)



ADR = Dangerous goods recognition Automatic registration of dangerous goods transports and their cargo types, reads written and emty signs. SENSOR

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| swissDRONE AI

Aerial observation and counting of multimodal traffic situations. Detection of movement patterns for all transport users across a wider perimeter. Prevention of near-accidents.



Observation and counting of multimodal traffic Nodal flow analyses Traffic flow Parking Analyses of near-accidents



Multimodal
Autonomy for 60 minutes
Speeds
Accurate lane tracking
Congestion-resilient
Simple installation
9 object classes



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ALSO COVERS WIDER PERIMETERS

At a suitable height, drones enable coverage of a wider observation perimeter, along with precise tracking and counting of all movements within it. The high resolution of the mounted camera enables visualisation of even the smallest objects such as pedestrians or cyclists using our AI software. All data protection requirements according to the GDPR are observed.

Special drones that receive power via a cable to the ground are deployed for assignments lasting more than 60 minutes.





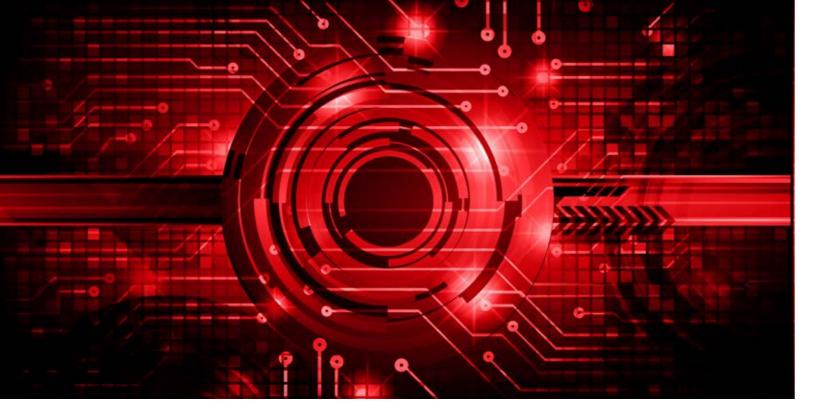
Routes of travel are also determined, in addition to counting. Provides aerial analysis of how long parking procedures last as well.



Observation and counting of multimodal traffic in wider perimeters and identification of near-accidents (safety deficits).



Autonomous for 60 minutes. Can be extended to several hours if necessary.





swissLASER

swissLASER was specially developed for directional counting of individual motorised traffic and to satisfy even the most rigorous accuracy requirements in an urban environment. swissLASER is able to distinguish up to ten vehicle classes according to SWISS10.



Counting IMT Detection of congestion Parking



2 lanes simultaneously
Real-time data
Congestion-resilient
No lane encroachment
Simple installation
SWISS10 (10 vehicle classes)
Laser Class 1
Proprietary dashboard



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TECHNOLOGY

The laser technology emits up to four beams. These are invisible to the human eye and harmless. The point cloud they create replicates the vehicle shape with the exact vehicle dimensions, enabling both precise classification and identification of any height and width restrictions.

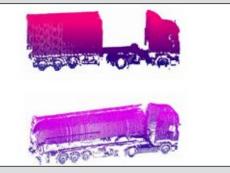
The laser can be mounted either at the side or overhead. It also provides highly accurate speed measurements if the "Radar" option is enabled.

The laser complies with data protection requirements, as it does not record or transmit images. Precise laser detection distinguishes between the lengths and profiles of vehicles.

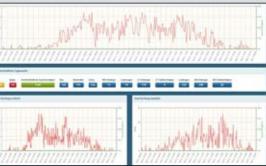




Two lanes can be covered simultaneously if the system is mounted at a height of around 8 m.



The laser point clouds map the precise vehicle shape and therefore differentiate up to 10 vehicle classes.



swissLASER has a neatly arranged, proprietary dashboard.





swissRADAR

A lateral radar device for intermittent and/or regular traffic counts, the identification of road sections with excessive vehicle speeds and for the collection of data used in urban traffic development plans.



30 km/h zones Counting IMT Speed detection



Fixed or mobile counting station
Autonomous for up to 3 weeks
if mobile
Speeds
Accurate lane tracking
Simple installation
4 vehicle classes
GSM



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TECHNOLOGY

swissRADAR is characterised in particular by its capability for prolonged autonomous operation of up to three weeks without replacing the battery. Can be equipped with Solar and 4G modules to generate real-time data as a permanent counting station. Unsuitable for locations with congestion or stop & go traffic, as these factors distort the results.

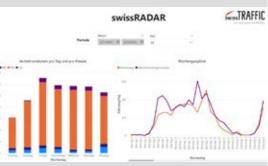




Up to 3 weeks of continuous operation possible.



Extended mounting height of between 1 and 8 metres.



Extensive, clearly arranged dashboard.





swissBIKE+PED LIGHT

This IoT sensor is specifically designed for the needs of tourist facilities such as parks and trails or for natural settings and is used to count hikers and cyclists, for social clubs or events without ticketing etc.



Counting tourists, cyclists, hikers, cross-country skiers, people attending events Pavements



Autonomous for 2 years Real-time data in the app Simple installation Counting widths of 1–6 metres 2 object classes SIGFOX, GSM Plug & count



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TECHNOLOGY

The boxes use digital heat detectors. These components act like miniature thermal imaging sensors.

They concentrate infrared heat radiation when people cross the sensor beam. Digital analysis of this signal can be used to count the number of objects and determine their direction of travel. The speed is also used to distinguish between people and cyclists. These boxes are simple, small, adaptable to any environment and operate autonomously.



Counting width per sensor: 1 to 6 meters. Ideal width: 3m to ensure accuracy of over 95%. If the width is more than 3m, the accuracy decreases to 90%



Immediate start-up - no electrical connections, Recognition of the direction of passage, single or double direction.



Can be integrated into a wooden post.



AI SWISSNOISE AI

Traffic noise is measured and analyzed using a sensor with 64 microphones and artificial intelligence, which allows for directional separation. If necessary, it can be evaluated with an ANPR camera. The downstream LED display raises awareness and encourages noise-conscious driving, leading to a significant reduction in noise.



Impact analyses for 30 km/h speed
limits
Recording of noise emissions
Awareness raising among vehicle
owners



Fixed or mobile counting station
Solar-powered if mobile
Accurate lane tracking
Real-time data
With LED display
Simple installation
Proprietary dashboard



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DETECT AND FINE AUTO-POSERS

It is possible to determine a noise threshold and consolidate the number of vehicles exceeding this threshold. This allows law enforcement to penalize auto posers with reliable evidence. The police can target and control known routes and meeting points of auto posers and issue fines.

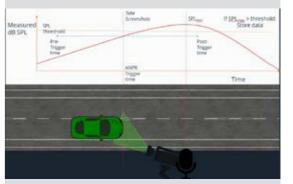
All licence plates are registered, but only those of excessively loud vehicles are ultimately stored. At the same time, a short video sequence is created showing the exact location of the noise source. This enables distinguishing vehicle noise from potential ambient noise.

The optional LED information panel raises awareness and motivates encourages noise-conscious driving. Practical experience demonstrates significant success in noise reduction at locations equipped with swissNOISE AI.

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Detects excessively loud vehicles (auto posers) and can provide a short video displaying the precise position of the noise source as evidence. Only license plates of excessively loud vehicles are automatically stored. A clear dashboard also presents the noise of all vehicles in the road cross-section.



The highly sensitive sensor detects ambient noise and analyses the noise profile using integrated machine learning software Al.



SWISSNOISE raises awareness and encourages noise-conscious driving.





BlueScan

BlueScan logs journey times and delays in real-time for both personal transport and cycling. This enables deficiency analyses to be performed and the optimisation of traffic distribution and connections.



Analysing travel and loss times Section speeds Effectiveness analyses



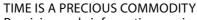
Bluetooth (12dB), BLE (4dB), WiFi (4dB) Permanent metering point or mobile 7 days autonomy when mobile Speeds Realtime data, GPS, 4G-modem LED display 3 vehicle classes Personal dashboard



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Geographical information systemm Real-time and historical data, forecasting, extensive reporting engine with recurring and adhoc reports, dashboard, key performance indicators.



Receiving early information can improve the mobility patterns of transport users. Reliable predictions can be made regarding journey times and delays by incorporating AI together with the measurement of real traffic events.

TARGETED IMPACT ANALYSES

Gains (or losses) in travel times are the best and most effective way of substantiating statements about the impact of infrastructure projects or accompanying measures over a longer period.

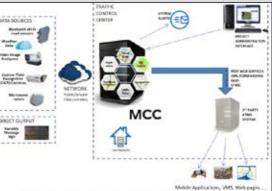
MULTISOURCE CONTROL CENTER (MCC)

The Multisource Control Center is the data analysis platform designed for a variety of traffic and environmental data sources.

The system analyses data from a wide range of sources and generates, among other things, travel times, congestion and congestion alerts, traffic, environment and environmental data and images. MCC assesses data quality in real time and adjusts data intervals to statistical measurement quality. The system offers a number of different algorithms and filters to adapt to all types of road and infrastructure.

MCC has various KPIs, comparison matrices, asset management for operational monitoring and automatically generated reports.

Visualisation



Multisource Control Center (MCC)



LED display indicating delays.



Clear and comprehensive dashboard

Ζ





swissparking al

End-to-end solution for the public sector, private enterprises and private properties. From the issue of access rights and a reservation system, to barrier authentication and automatic shuttle buses, this product supports all of your parking requirements.



Municipal parking facilities Tourist or event parking Company parking Property parking On-street ofr off-street car parking



FEATURES End-to-end hard- + software solution Payment app, dynamic parking fees Issue of access rights Parking space reservation Authentication at the barrier Automatic parking buses

Origins: country/canton/town Fixed or mobile solution

Proprietary dashboard



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PUBLIC

The professional, cloud-based platform gives municipalities an end-to-end solution for parking management. swissPARKING AI improves the capabilities of your traffic infrastructure, limits congestion and reduces the search for parking spaces. Car parks must be accessible at all times and well frequented. 85% is considered a benchmark for optimum occupancy.

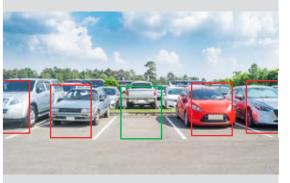
The price is an effective instrument for controlling occupancy levels in car parks. A carefully selected fee structure balances demand and minimises unnecessary traffic. Prices can be adjusted flexibly to prevent bottlenecks or stimulate use. This means that pricing should certainly be dynamic.

PRIVATE

Companies sometimes struggle with the increasing scarcity of parking spaces and long waiting lists. Digital parking solutions help them to manage this problem and provide facilities for their staff both easily and efficiently.

In today's world, smart IoT technology and innovative software and app solutions create innumerable opportunities to make better use of available parking capacities. Aside from standard elements like number plate recognition, visitor reservations and an array of app functionalities, swissPARKING AI offers additional modules to enhance your end-toend solution. swissPARKING AI can even be integrated into existing systems.





Distinguishes between free and occupied parking spaces with the help of artificial intelligence (AI).





Clear and comprehensive dashboard

PARKING





swiss**SPEED**

The swissSPEED is a strong, effective sensor to prevent traffic accidents with non-motorised road users, for example, or to bring more calm to neighbourhoods.



Measure speed of motorised traffic Speed prevention in the vicinity of schools Alert on road construction sites

Increase safety in neighborhoods

Speed reduction to protect vulnerable road users

Accident prevention on industrial sites



> 200 m range
 Shows speed from 5 to 199 km/h
 Real-time data
 Works with rechargeable battery,
 electricity or solar panel
 LED Display
 daily/hourly variable texts and speeds



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swissSPEED 1

is a speed display with space up to 39 cm. It has a successive display of three messages (speed, short text or pictograms)



swissSPEED 2

displays the speed together with text or picture messages. It combines a number with a full LED matrix to display texts or pictograms.

A three-colors text matrix is available as an option.



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Can be connected to a solar panel.



Own clearly arranged dashboard.



swissSERVICES

Our mobility experts assist you from planning to implementation. We offer everything from a single source, including consulting, data collection and collaborative development of a solution.

IDEAL APPLICATION AREAS

Traffic flow simulationsDevelopment planningTechnical traffic studiesPerformance capability analysesAccident analysesReconstruction conceptsEnd-to-end parking solutionsHolistic traffic conceptsSafety analyses



From identifying the problem to creating the solution Mobility engineers & fitters Over 20 years of experience State-of-the-art technology Installation and maintenance

Ľ	COMBINABLE PRODUCTS	

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WE HELP YOU ACHIEVE STRATEGIC MOBILITY OBJECTIVES – FOR SMART MOBILITY IN TOMOR-ROW'S WORLD.

Our company has a highly qualified pool of specialists. It goes without saying that we operate consistently at the cutting edge of technology and strive to build green and economically viable solutions.

As traffic engineers, we deliver expert planning and competent advice. Professional technology and state-of-the-art technology are used in the execution of all our assignments.

Our engineers have developed processes for mobility intelligence analytics that enable the real-time evaluation of big data. We make use of open data and also collect our own information.

This means we can offer a full service – from planning to implementation – from a single source based on more than 20 years of experience. You are in safe hands with us.



As traffic engineers, we deliver solution-oriented planning and competent advice.



Planning and achievement of strategic mobility objectives.



Installation and maintenance of sensors by qualified SWISSTRAFFIC staff. SERVICE





| swissDASHBOARD

Modern, interactive, customisable, multimodal dashboards with predictions and APIs that map multimodal mobility in real-time.



Pairing clarity with KPIs for optimised ease-of-use.



APIs for your own dashboard
Customisable
Expandable
All data exportable
Predictions
Meteo



Pages 10-35 all swissSENSORS



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Comprehensive, customisable dashboards for quick and easy evaluation of your collected traffic data.



You select your relevant parameters and receive clear representations of your data in real time at any time and from anywhere.



Dashboard for traffic experts. A variety of neatly arranged performance indicators are displayed per period and object class at the push of a button. DASHBOARD





PRODUCT OVERVIEW	COUNTING	MOTORISED TRAFFIC	CYCLISTS	PEDESTRIANS	ORIGIN-DESTINATION, TRANSIT	SPEED	PARKING	LANE RECOGNITION	REAL-TIME	CONGESTION RESISTANT	EASY TO INSTALL	DASHBOARD	LED DISPLAY	PERMANENT COUNT LOCATION	MOBILE INSTALLATION	NUMBER OF VEHICLE CLASSES	AUTONOMY WHEN MOBILE	ADDITIONAL USES
swissTRAFFIC AI					D							✓	✓	✓		9		4/5G, TURN OFF RELATIONS
swissSAFETY AI				ightarrow								✓	√	√	✓		7 D	RIGHT OF WAY, RED LIGHTS, ILLEGAL PARKING
swissSCOUT AI												✓			✓	10	7 D	
swissBIKE+PED CROWD				ullet		D					0	✓	✓	✓		3		LED DISPLAY, + E-SCOOTERS
swissANPR AI			lacksquare			lacksquare			0			✓	✓	√	✓	10	5 D	ORIGIN, E-VEHICLES, E-CAR, CO₂
swissDRONE AI												\checkmark			✓	9	1 HR	
swissLASER	ullet	ullet				D		ullet	ullet		\bullet	√	√	√		10		SWISS10
swissRADAR									lacksquare			✓			✓	4	3 WKS	4/5G
swissBIKE+PED LIGHT												✓		\checkmark	\checkmark	2	2 Y	
swissNOISE AI		ullet						ullet	ullet	ullet		✓	✓	✓	✓	10	SOLAR	E-VEHICLES
BLUESCAN			lacksquare		lacksquare							✓	✓	✓	✓	3	7 D	DELAY TIMES
swissPARKING AI												\checkmark	\checkmark	\checkmark	\checkmark		5 D	
swissSPEED		ullet										✓	✓	✓	✓		SOLAR	LED TEXT-DISPLAY, 4G

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