SMART MOBILITY NEWS

ISSUE NO. 4 · OCT 2023

SAFE THROUGH THE CITY

Safety is a fundamental necessity and often presents complex challenges in urban areas. Achieving safe urban living requires a comprehensive strategy that takes into account all facets of urban planning. Only in this way can a city be created that is secure and livable - more on page 5.

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SWISSTRAFFIC BECOMES PART OF THE COMPANY GROUP

With two new subsidiaries in Paris and Ljubljana - additional locations are in preparation - we have evolved into a dynamic corporate group.

This expansion, driven by the growing demand for intelligent mobility solutions internationally, marks a significant milestone in our development. In 2023, we established two new companies under the name SWIROO in France and Slovenia, which are now a proud part of the SWISSTRAFFIC group.

This step emphasizes our relentless commitment to innovation and growth and our determination to expand our reach. We look forward to this new era and are confident that it will positively impact on our company, our employees, and our valued customers.

Our heartfelt thanks go to all employees and partners who have supported us in this significant endeavor. We can hardly wait to discover this new phase in the SWISSTRAFFIC history.

SWIROO
we innovate mobility

SWISSTRAFFIC'S NEW SUBSIDIARY IN FOCUS

Since April 2023, the SWISSTRAFFIC Group has welcomed an aspiring new member into its ensemble with SWIROO France, led by the dynamic CEO Erwan Michel. With his arrival, this team brings fresh air and new perspectives to the market.

The heart of SWIROO France beats in the capital city of Paris. Under the experienced leadership of Erwan Michel, all French projects are already being implemented with great success. Moreover, our Paris office also oversees projects in several surrounding European countries.

By integrating SWIROO France, the SWISSTRAFFIC Group reinforces its position as a leader in intelligent mobility, traffic planning, road safety, and multimodal traffic counting.

ERWAN MICHEL

CEO SWIROO France

- 42 years young
- Married, 3 children
- Education: Bachelor's in Image Processing Engineering from ENSSAT and MBA from the School of Business in Rennes
- Top Skills: Strategic Marketing and Innovation in Artificial Intelligence
- Sports: Volleyball and Kite-Surfing

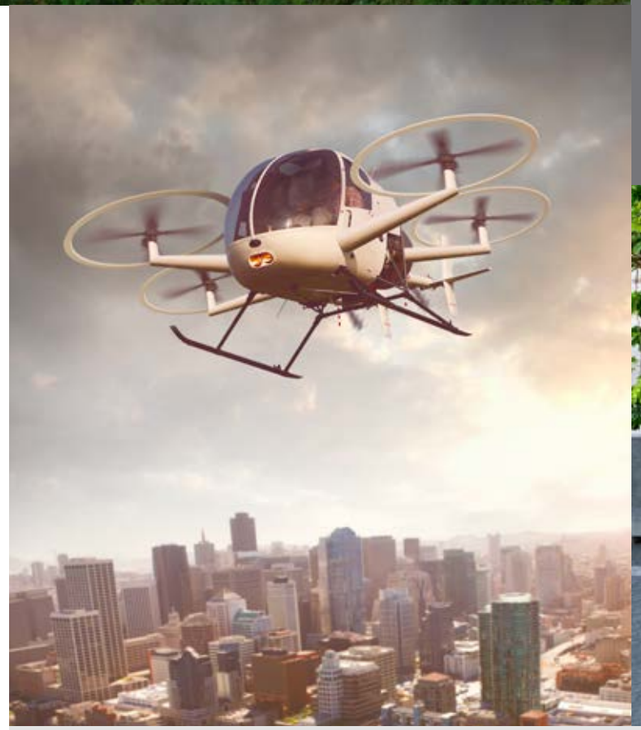
SMART CITY

THIS IS WHAT THE FUTURE OF MOBILITY LOOKS LIKE

HOW DOES A CITY BECOME A SMART CITY?

Transforming a city into a „Smart City“ is an ongoing process. It starts with a clear plan for enhancing the city. Subsequently, technologies like the Internet of Things and artificial intelligence are introduced to gather and analyze data. Furthermore, there is a strong emphasis on sustainability and resilience against challenges.

In the realm of mobility, traffic flows are optimized, and congestion is reduced through the utilization of sensors, cameras, and data analysis. Additionally, intelligent systems can efficiently manage traffic. Autonomous driving, electric mobility, and optimal integration of various modes of transportation significantly enhance both quality of life and safety.



Drone taxi over a metropolis; a future alternative for congested roads.

A SOUGHT-AFTER PARTNER FOR INTERNATIONAL MAJOR PROJECTS

Smart city projects aim to improve city efficiency and reduce their ecological footprint. This is achieved using renewable energy, intelligent resource management, and well-thought-out traffic planning and control. The overarching goal is to improve the quality of life for urban residents.

Currently, we are engaged in several smart city projects. For instance, Al-Ula (UNESCO), NEOM, Oxagon, The LINE, Soha, Al-Seeb, Tashkent, Paris, Maribor, Lausanne, and Zurich. SWISSTRAFFIC leverages its expertise in intelligent mobility, traffic modeling, and road safety.

Autonomous driving: Detection of a pedestrian triggers automatic vehicle braking.

We thoroughly analyse the existing situation, identify weaknesses and bottlenecks, and devise measures to enhance the transportation infrastructure. We aim to establish an efficient, safe, and environmentally friendly transportation system that caters to the needs of all road users.

Alongside multimodal hubs at the city level, the depicted Mobility Links of the future play a significant role in the last mile transportation.

NEAR-MISSES
A NECESSARY ANALYSIS FOR ENHANCED SAFETY

PROMOTING SLOW TRAFFIC IN URBAN TRANSPORT: A STEP TOWARDS SUSTAINABILITY

An increasing number of cities are recognizing the value of the so-called „slow traffic.“ Urban conglomerates are urged to articulate specific objectives regarding how they intend to promote slow traffic. The advantages of slow traffic are diverse and sustainable; here are a few examples:

1. Environmental Friendliness
Reduces air pollution and greenhouse gas emissions, and promotes environmentally friendly urban development.

2. Health
Active transportation promotes fitness, supports a healthy lifestyle, and enhances public health.

3. Congestion Reduction
Mitigates traffic congestion, ensures smoother traffic flow, and reduces travel times.

4. Space Saving
Requires less space than personal vehicles and creates room for public areas such as recreational zones and green spaces.

5. Cost Savings
Decreases the need for expensive transportation infrastructure, saving costs on maintenance and expansion.

6. Reduced Noise
Leads to a quieter urban environment.

7. Accessibility
Barrier-free and suitable for all age groups and abilities, fostering inclusive urban design.

8. Economic Benefits
Strengthens local businesses and industries.

Active transportation is essential for future-oriented and health-conscious urban planning.

With the increasing traffic volume and the growing complexity of transportation networks, the number of near-miss incidents is also rising - situations where only a stroke of luck or swift reaction prevents an actual collision. To better comprehend these critical events and avert future incidents, we've developed specialized analysis tools. Our approach involves three steps:

1 Pre-Analysis

Our tools capture and statistically evaluate all near-miss incidents. The result is a risk matrix that provides an overview of all near-miss events, categorized by severity. The color coding ranges from red for a very high likelihood of accidents and high injury level, to orange for a moderate likelihood of accidents and injuries, and green for low to no possibility of accidents and minimal/no risk of injuries.

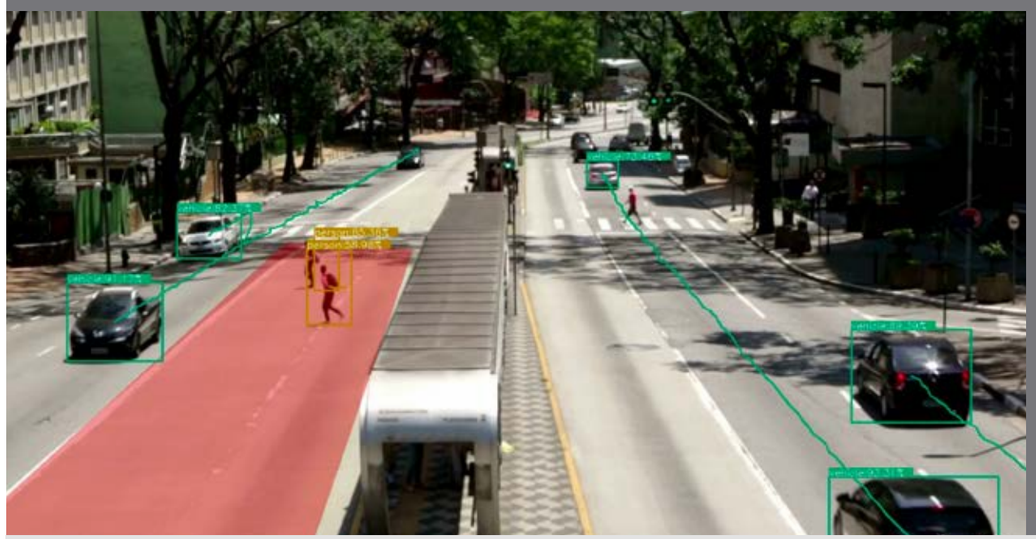
2 Identification of Hazard Zones and Formulation of Measures

Based on this risk matrix, critical near-miss incidents are examined in greater detail. Our safety experts develop solutions to enhance traffic safety at these locations through infrastructure measures.

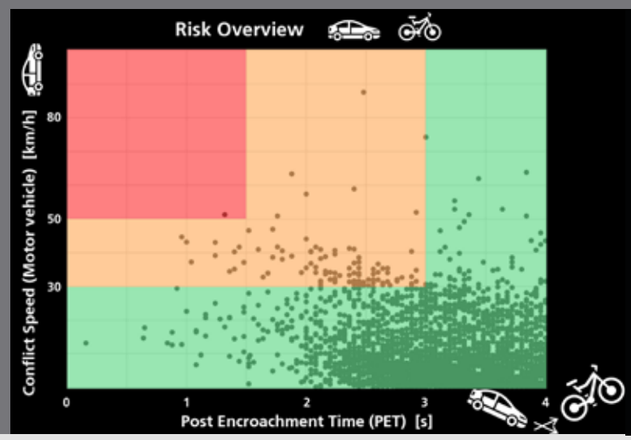
3 Effectiveness Analysis

However, the work doesn't conclude with implementing these optimizations. A subsequent effectiveness analysis is essential. The results are incorporated back into a risk matrix. By comparing risk matrices before and after the implementation of measures, ideally, no situation should remain in the red zone. As few as possible should be in the orange zone.

This process demonstrates the significance of systematic capturing and evaluation of near-miss incidents. Only through this can we identify risks, implement appropriate measures, and verify their effectiveness to make roads safer.



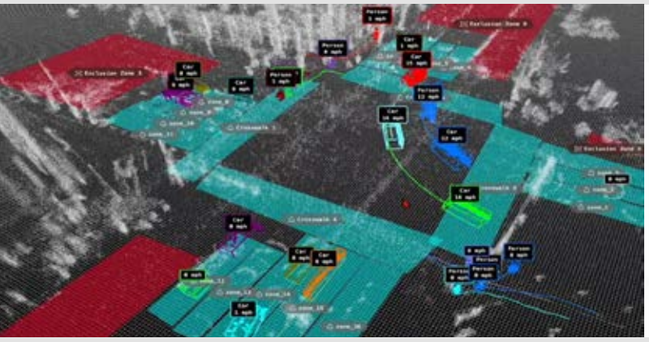
Detection of a hazardous situation. Automatic analysis to determine if it qualifies as a near-miss incident.



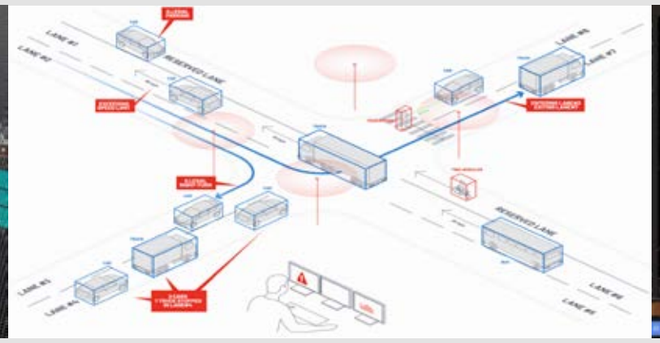
Results are consolidated in a risk matrix, illustrating the significance of near-miss incidents.

swissLIDAR AI
3D SPATIAL INTELLIGENCE

PRECISE DATA IS PROVIDED THROUGH SPATIAL INTELLIGENCE



Multimodal real-time monitoring of an entire intersection with the highest precision and compliant with data privacy regulations.



Accurate vehicle sizes, distances, and speeds. Pedestrians and cyclists are detected up to 90m away.

Real-time dashboard displaying key performance indicators (KPIs) such as service level for various conditions.

Highest capture accuracy under all lighting and weather conditions.

WHAT IS swissLIDAR AI?

Lidar (Light Detection and Ranging) utilizes eye-safe laser beams to „see“ the world in 3D, providing machines and computers with an accurate representation of the measured environment.

The Lidar sensor emits laser pulses and measures the time it takes for the pulse to reflect and return to the sensor. Based on this measurement, the sensor creates a point cloud model of the surroundings, allowing for an accurate depiction of objects and their positions.

swissLIDAR AI perfectly combines a Lidar sensor and modern software for precise environment capturing and advanced real-time processing of 3D data.

VEHICLE MONITORING AND ITS APPLICATIONS

- Counting multimodal traffic and identifing near-miss incidents.
- Observation of vehicles and pedestrians to improve the safety of vulnerable road users.
- Monitoring parking occupancy to enhance operational efficiency.
- Ready solutions for users (dashboard, KPIs,alarms) and an API.
- Intelligent software built with key components to deliver value across various applications.

DATA PRIVACY COMPLIANT

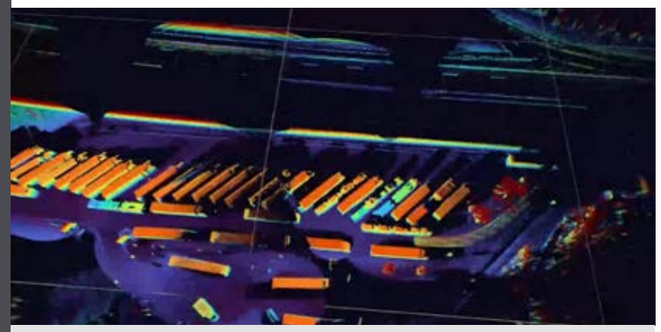
WORKS UNDER ALL LIGHT CONDITIONS

EXTREMELY HIGH PRECISION (CM)

SCALABLE FOR NUMEROUS ITS APPLICATIONS

EXTENSIVE COVERAGE

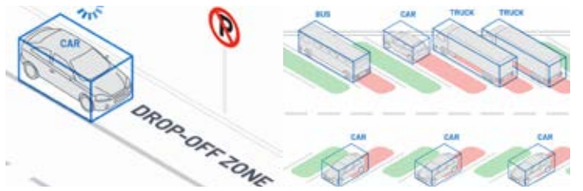
3D SPATIAL INTELLIGENCE



Real-time monitoring of truck parking spaces at highway rest areas, including vehicle and parking space dimensions.

Pedestrian Crossings
Counting, safe crossing, jaywalking, pedestrian flow, near-miss incidents, alerting...

Road
Counting, vehicle classes, speeds, traffic start/end, lane change, wrong turns, vehicle height, wrong-way driving, debris on the road...



Stopping Zones
Parking management, unauthorized parking, stopping bars, stopping bar violations...

NOISE PROTECTION
A COMPLEX TASK

Detection and Determination of Noise at the Source.

Engagement of the Canton of Zurich for Protecting the Population from Noise Pollution.

In collaboration with SWISSTRAFFIC, the Canton of Zurich has initiated a project to reduce road noise and improve the quality of life for its residents. The project aims to update the canton's noise map and develop a comprehensive measurement concept for all road sections in the selected areas.

The project involves capturing posted speed limits, gradients, and the number of traffic signal systems (TSS) in a Geographic Information System (GIS). This allows for a detailed analysis of noise pollution per route.

To obtain accurate data, we conduct traffic surveys using state-of-the-art radar devices. These devices capture traffic flow and measure sound levels, providing a comprehensive picture of the noise situation.

The collected data calculates noise-related metrics such as average daily traffic, nighttime proportion, and the percentage of noisy vehicles. This information is crucial for implementing targeted measures to reduce noise.

With this initiative, the Canton of Zurich emphasizes the importance of noise protection in densely populated areas and demonstrates that effective noise control is achievable.

SWISSTRAFFIC for less noise
We measure traffic noise separately in both directions using sensors equipped with 64 microphones and artificial intelligence. When necessary, we also analyze the data using ANPR cameras. This enables us to, for instance, enforce penalties against noisy car enthusiasts based on reliable facts. The police can selectively monitor known routes and meeting points of such enthusiasts and issue fines.

swissNOISE AI - HIGH-PRECISION NOISE MEASUREMENT WITH LICENSE PLATE RECOGNITION FOR EXCESSIVELY LOUD VEHICLES

A sensor with 64 microphones and AI accurately captures traffic noise in different directions and can and can be supplemented by an ANPR camera optionally.

DETECTING AND FINING CAR POSERS

There is the possibility of determining a noise threshold and consolidating the number of vehicles exceeding this threshold. The reliable data facilitates the enforcement of penalties against car posers and issuing fines by monitoring known routes and meeting points.

Only license plates of vehicles exceeding the established noise threshold are registered. Simultaneously, a brief video sequence is generated, pinpointing the exact location of the noise source. This allows for differentiation between potential ambient noise and vehicle noise. Moreover, additional information such as origin (country, canton), age, engine type, drive mode, etc., can also be captured in compliance with all data protection regulations.

By default, swissNOISE AI distinguishes between 2 vehicle classes: passenger cars and trucks.

Optionally, up to 10 vehicle classes (SWISS10) can be recognized.

ANPR/ADR
Hazardous Goods and Major Accident Ordinance

ADR: Automatic Registration of Hazardous Goods Transport and their Types of Cargo

SWISSANPR AI also includes registering hazardous goods transports (ADR) automatically. ADR stands for „Agreement concerning the International Carriage of Dangerous Goods by Road.“ The ADR system establishes an international standard that ensures the safe handling and transportation of dangerous goods on roads.

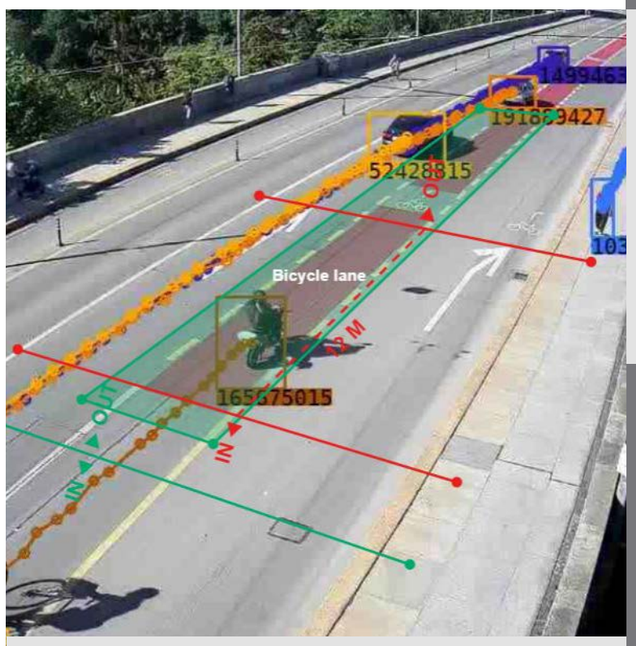
SWISSANPR AI is a crucial tool in many of our transportation projects. For instance, at a highway rest area near Reims in France, we captured hazardous goods transports for SANEF (operator of 1807 km of highways in northeastern France) over a month. In this context, we could distinguish both fully loaded and empty hazardous goods signs.

Hazardous goods transport in Switzerland with cargo labeling using an orange sign.

ARTIFICIAL INTELLIGENCE
OUR WIDE RANGE OF AI SOLUTIONS

Artificial Intelligence (AI) in traffic observation enhances the efficiency and safety of road traffic. It recognizes vehicles and accidents in real-time, optimizing traffic flow through the control of traffic lights and management systems. AI also supports monitoring traffic violations and enables the prediction of traffic patterns.

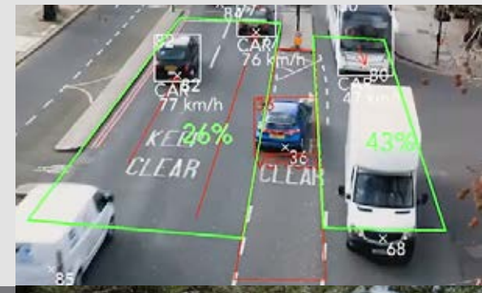
Using artificial intelligence, many other issues like fires (wildfires), smoke detection, or lost objects can be detected (early). We provide a wide range of AI applications that can be combined as needed.



Capturing and analyzing traffic on a bridge to assess hazardous sections.

Smart Road

ROAD-LIGHT: Counting and classifying vehicles (including new additions like E-Scooters, strollers and wheelchairs), color and speed detection.
VIOLATION: Detection of red-light violations.
INCIDENT: Real-time identification of abnormal and hazardous situations on the road.
LOST: Detection of abandoned or removed objects in monitored areas.



Intelligent Video Surveillance

FIRE: Early detection of fires indoors and outdoors.

SMOKE: Early detection of smoke indoors and outdoors.

Intelligent People Flow Analysis

MASKING: Blurring individuals in video capture for privacy reasons.
PEOPLE: Counting individuals at entrances and exits.

CROWD: Counting large crowds and assessing behaviors in outdoor areas.
HEAT: Measuring people flow to identify areas of highest/lowest interest.

Smart Parking

PARKING: Detects the occupancy status of parking spaces in indoor and outdoor areas.

ADDITIONAL PROJECTS
A BRIEF GLIMPSE INTO CURRENT WORKS

Altstätten SG

Open Space in the City Center

Altstätten, as the only town in the St. Gallen Rhine Valley, is located at the intersection of several major roads (Stoss-, Rorschacher-, Kriessern-, and Oberrieterstrasse). These connections pass through the historical city center, increasing traffic and significant conflicts between settlement, environment, and transportation. This leads to high noise and pollutant emissions affecting residents and employees.

To improve the quality of life, we are supporting the city with a detailed traffic survey and subsequent analysis of the impacts of various road infrastructure projects.

Using 40 license plate cameras and 10 junction power countings via video, including congestion analysis at the railway crossing, over a week, we are establishing the basis for analyzing and quality checking the collected traffic data and creating graphical representations of the results and detailed traffic modeling. Furthermore, we are developing recommendations for further steps and the effectiveness of current project ideas.

Alpnach OW

Relieving the Village Center

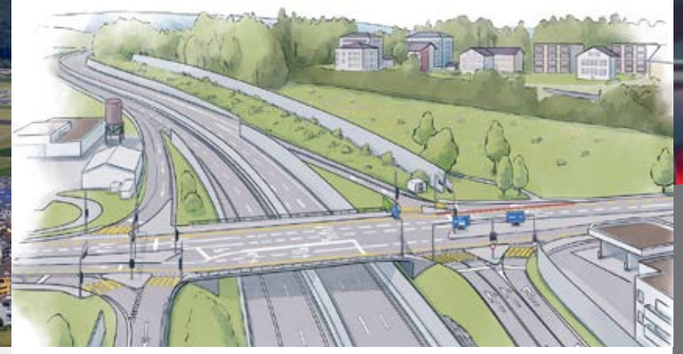
The Canton of Obwalden and the municipality of Alpnach have a significant interest in expanding the Alpnach Süd junction to a full interchange. This expansion would relieve the through traffic in the village center, particularly heavy traffic could be prevented from passing through the village center using appropriate signage.

Two new ramps for entry towards Lucerne and exit from Lucerne are necessary for this purpose. The ramps and the required new lanes for deceleration, acceleration, and merging, are 450 to 500 meters long. The potential future expansion to four lanes is also taken into consideration.

For this project, SWISSTRAFFIC identified the origin, destination, and transit traffic, and modeled the expected traffic situation in the center after the full interchange‘s opening.

Emmen Nord, Lucerne

Full Interchange for the Highway



An illustrative example of our work is the project in collaboration with the Federal Roads Office (ASTRA) for the reopening of the N02 Emmen-Nord full interchange.

The entry and exit ramps to and from Basel, which had been closed for years, are being upgraded and reopened in compliance with standards, in addition to the existing routes to/from Lucerne.

We analyzed the traffic impacts of redesigning and reopening the Emmen-Nord interchange, including its effects on public transportation and routes for slow-moving traffic. Based on our findings, we proposed accompanying measures to mitigate these impacts.

City of Thun
BlueScan assesses urban travel times before and after implementing a measure at the Lauitor roundabout to validate its impact and effectiveness. SWISSSCOUT is also utilized for tallying and monitoring congestion.

City of Lucerne
As part of the comprehensive traffic concept in the City of Lucerne, we evaluate urban travel times before and after the implementation of planned improvements. This allows us to assess the effectiveness of the measures.

Grenchen Interchange
At the Grenchen highway exit, a bypass construction is underway. We are assisting the project in optimizing safety and convenience for slow-moving traffic at two roundabouts („dog bone roundabouts“).

Highway A9 - Pfynwald
During the construction of Highway A9, traffic between Siders and Leuk will be exclusively routed on T9 along the right bank of the Rhone. Significant traffic disruptions could occur in case of accidents or other unforeseen events. We provide traffic engineering support in this scenario and contribute to the development of an emergency response plan.

AT WHICH TRADE FAIRS CAN THE SWISSTRAFFIC GROUP BE FOUND?

Participating in global trade expos links us with fellow experts and aids in forming valuable partnerships. We look forward to meeting you in person and gaining further insights into your interests and challenges related to sustainable and smart mobility.

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LES RENCONTRES DE LA MOBILITÉ INTELLIGENTE

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