

SWARCO DRIVEON

CORPORATE MAGAZINE | 01-2020

C-ITS

When infrastructure and vehicles "talk" to each other

BETTER ROAD MARKINGS

Their importance in the age of automated driving

MYCITY

Holistic traffic management for liveable cities

SAFELIGHT AND MORE

Innovative add-ons for traffic signals





CONTENTS

C-ITS – an overview	04
New software solution center in Berlin	07
Greenfield Amstetten	08
Road markings – for human drivers and CAV	10
Traffic management for tunnel upgrade	12
Improved parking at Warwick University	14
Traffic management from a bigger perspective	16
Holistic parking management	18
More safety for vulnerable road users	20
Innovative traffic light features	21
CUBILED – advanced VMS technology	22
X-LINE your intersections	23
LIMBOPLAST D480 – the allrounder	24
SWARCO Advanced Industry Systems	25
McCain 2020: A look back	26
Safe infrastructures made in Switzerland	28
Road markings in Nicaragua	29
How SWARCO solutions are beneficial for society	30

IMPRINT:

Content coordination and Editor-in-Chief: SWARCO AG / Richard Neumann; **Layout, graphics:** pia GRAFIK & DESIGN, Pia Frankowitsch, Schwaz; **Contributors to this edition:** Jennifer Blair, Robert Buchinger, Martin Franke, Wojciech Goj, Valerie Hofstetter, Tiffany Howell, Andrea Krewer, Daniel Meier, Uwe Pertz, Daniela Pichler, Michaela Reitner, Stefan Vogt, Viktorija Zymantaite; **Photo credits:** SWARCO, Bergauer, McCain, Stadt Ludwigsburg/Benjamin Stollenberg, Grubner/NÖN, Shutterstock; **Print:** offset 5020, Siezenheim; **Circulation:** 5000 copies

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DEAR READER,

Exhibitions and sports events cancelled or postponed, employees working from home, major traffic arteries deserted, restaurants, schools and universities closed, curfews imposed, social contacts reduced to a minimum, thousands of people infected by a new, dangerous disease – the Coronavirus crisis has a massive impact on our health systems, our everyday life, and the course of business. Normally, this magazine shows a list of events where you can meet us in person throughout the year. Not this time. The future is more unpredictable than ever, and so are our planned participations in the ITS European Congress in Lisbon (May), the Central Eastern ITS Congress in Kazan (September), the ITS World Congress in Los Angeles (October) or the Smart City Expo World Congress in Barcelona (November). For sure, you are aware that Intertraffic Amsterdam 2020 had to be postponed to March 2021.

SWARCO's great 50th anniversary year 2019 is over, and we all could have imagined a better start into 2020. In 2019 we commemorated founder and mastermind Manfred Swarovski and experienced the unique family spirit at numerous celebrations in the companies of our international group. And we still have good reasons to celebrate, since the past fiscal year has also been a very successful one for SWARCO businesswise, with a new record high in revenues, exceeding the 700 million euros threshold. However, in 2020, the world economy looks different

with lots of uncertainties. The health of our staff remains the top priority to keep our operations and business going.

SWARCO, with its 3,800 family members, is strong enough to tackle the current challenges and eventually emerge from the crisis even stronger. We are confident that we will make it – together with you, our valued business partners.

In the present issue of our corporate magazine DRIVE ON, you can read about the stories and technologies with which we make travelling safer, quicker, more convenient and environmentally sound. Stakeholders such as traffic authorities, industrial customers, suppliers, traffic planners and engineering offices, financial institutions, research bodies and industry associations trust SWARCO with its know-how, products, systems and solutions that do it "The Better Way. Every Day."

Both in Intelligent Transport Systems and Road Marking Systems we have a lot to offer with often market-leading solutions. And more and more we are recognized as a competent partner in the age of digital transformation, where traffic control software comes from the cloud, where the road infrastructure "speaks" with the vehicles, where cybersecurity is ensured for hosted systems to operate critical infrastructures, and where road markings enable and safely guide the automated driving.

Just delve into our offerings and references by reading on. We thank all who helped create this edition and who help contribute to our business success with their commitment to SWARCO every day.

Yours sincerely,
The SWARCO AG Executive Board



Michael Schuch
Speaker of the Board
COO ITS Division



Philipp Swarovski
COO RMS Division



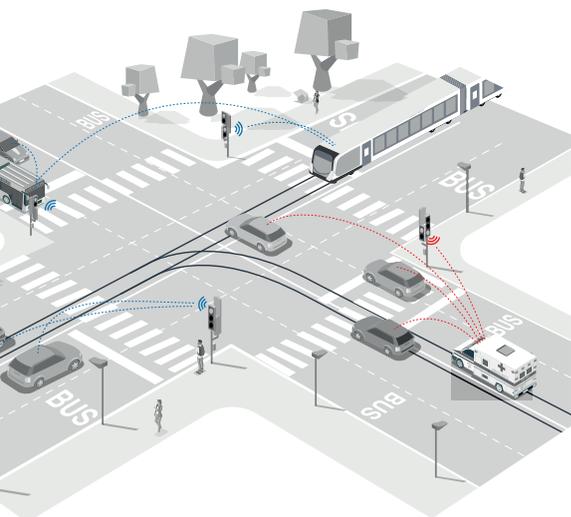
Günther Köfler
CAO





C-ITS – AN OVERVIEW

"COOPERATIVE INTELLIGENT TRANSPORT SYSTEMS" (C-ITS) DESCRIBE TECHNOLOGIES AND STANDARDS TO CONNECT VEHICLES WITH OTHER VEHICLES (V2V) AND INFRASTRUCTURE (V2X). THE IDEA ORIGINATED IN THE AUTOMOTIVE INDUSTRY AND AIMED AT INCREASING ROAD SAFETY. HOWEVER, WITH THE SAME STANDARDS, A NUMBER OF FUNCTIONS AND DIFFERENT TASKS IN TRAFFIC CONTROL CAN BE IMPLEMENTED. MARTIN FRANKE, SWARCO PRODUCT MANAGER FOR C-ITS IN GERMANY, GIVES US AN OVERVIEW.



Prioritise rescue services

A message emitted by special rights vehicles firstly informs other road user on an approaching emergency vehicle, triggering the formation of an emergency corridor, and secondly triggers a particular program at signal-controlled intersections switching the traffic light to green in the travel direction of the rescue vehicle.

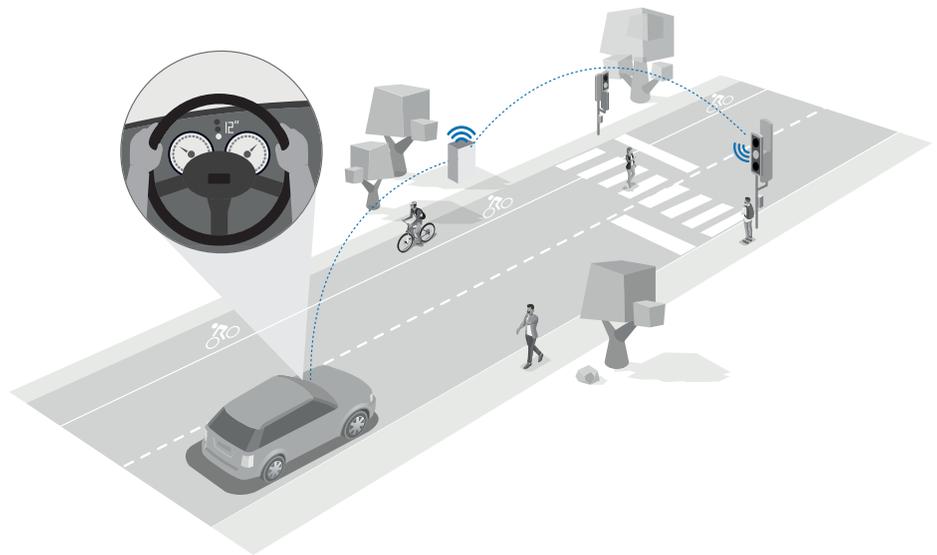
Thus the driver knows that it is safe to enter the intersection without other vehicles or pedestrians crossing his way.

Prioritise public transport

Due to the reorganisation of the non-public mobile land radio, changes are required in the communication between public transport and traffic light systems. Here too, C-ITS communication can be used: On the one hand, C-ITS can send R09.16 VDV standard telegrams and adopt modern technology and planning in the traffic light systems. On the other hand, C-ITS offers also the possibility to track the vehicle movement up to the traffic light, adapt the signal phase and give a feedback to the vehicle.

Better inform road users

With C-ITS, information on the current and future signalling of a traffic light system can be communicated, for example green time forecasts. If the road users know about their individual green wave, this results in energy savings, significantly less pollution and minimized stops, which conveys at the same time a positive city image. Also cyclists and other road users can enjoy a more attractive driving experience.



Warn of hazards

In the same way as safety trailers hint at roadwork zones on motorways via C-ITS, this technology can be used on the entire road network to warn of hazards, such as black ice or heavy rain, and this even without mobile internet.

Identify and count vehicles and measure traffic

Other than the selective, local identification, C-ITS is able to observe equipped vehicles every second over a certain distance (up to several hundred meters). This enables live statistics on waiting times, number of stops, congestion lengths, turning relations at intersections, and speed detection. In addition to these examples, there are further C-ITS uses that make traffic management safer and more efficient.

Technology

The system technology consists of several building blocks. Decisive elements such as message formats or communication channels are standardized. The devices, the software and their integration into existing technologies are available on the market. The most important elements are listed in the following overview:

Standardised messages

- **CAM:** The "Cooperative Awareness Message" (ETSI EN 302 637-2) describes the position, speed and direction of a vehicle. The message is regularly emitted from vehicles between 1 to 10 Hz. Optional contents are e.g. R09.16 telegrams or "rotating blue lights on."
- **DENM:** "Decentralized Environmental Notification Message" (ETSI EN 302 637-3) describes the coding of hazard warnings.
- **IVI:** "In-Vehicle Information" (ISO 19321) regulates the coding of traffic signs, including, for example, dynamic speed limit signage.
- **SPAT/MAP (SAE-J2735 and ISO 19091):** „Signal Phase And Timing“ can include both the current signalling status and its forecast. By referencing to the standardised description of the intersection topology (MAP), it becomes clear for which signal group or driving relation the signalling is valid. MAP displays lanes and stop lines by means of coordinate dots. Like all messages, SPAT/MAP can either be sent locally (useful for applications that require very accurate and safe

signalling information) or transmitted via Internet (useful for the dissemination of forecasts for certain applications, e.g. the waiting time at a signal-controlled intersection).

Communication channels

At first, C-ITS was developed for a local communication ("short range"). In a worldwide defined frequency range of 5.9 GHz, vehicles and infrastructure can directly communicate with each other. A mobile communications network is not necessary for this. The modem necessary for this kind of communication is part of the Road Side Unit, the C-ITS complement of the infrastructure. On the vehicle side, corresponding hardware can be retrofitted. In the VW Golf 8 it is already



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a standard. The first generation of short-range communication is called "ETSI ITS G5" or "802.11p". Another generation of short-range communication enters the market under the names of "C-V2X" or "PC5". Due to integrated chipsets for C-V2X and 5G mobile communication, several carmakers plan to equip their vehicles with this technology.

In addition, the generated messages can also be transmitted via the Internet. The information made available can then be sent via mobile communication to the road users. 5G promises more bandwidth and secured networks with guaranteed availability and fast local processing power ("Mobile Edge Computing"). This constitutes already today and even more in the future an important technological building block in modern networked traffic management.

New roles and tasks, more options

Just by buying and installing new hardware the benefit is not or only

partially accessible. A traffic system operator must understand his role and the related new tasks and has to co-design the technological transformation. This also implies the build-up of knowledge about connected systems, IT security and the protection of privacy in terms of GDPR, critical infrastructures or ISO 27001.

Operators of traffic systems have a strong starting point to contribute to new applications and thus to determine their quality. So for example, every traffic planner has the layout of an intersection and the corresponding signal program with its signal groups at his fingertips. From this he can quite easily create a MAP. Navigation map services are not able to reach this level of knowledge, quality and up-to-dateness.

The MAP is also the basis for new functions. It is possible to process the number of vehicles flowing into an intersection (possibly even to the exact lane), their expected arrival times and the presence of pedestrians and cyclists. So it is worthwhile for the planner to create

and maintain the MAP, as it takes only little time and effort. The signal programme knowledge can also be processed for a traffic light forecast. Meanwhile it has been proven that even with dynamic and adaptive control in very many cases a good forecast is possible. In different scenarios it was demonstrated that the knowledge about an upcoming traffic light switch is beneficial for an energy-saving and efficient handling of traffic.

It is not surprising that the provision of this function directly from traffic technology and locally on site at the intersection promises the best results. Under certain conditions, a centrally generated forecast can be an option as well. In certain cases this is the quicker way to get area-wide coverage. Those who have not yet or only barely engaged with these developments are often overwhelmed by the system. Ten years of development have generated a large amount of knowledge and experience in the field of C-ITS. Now it is time to apply the status quo of the developments in order to responsibly design our future.



THE SWARCO SOLUTION CENTER GMBH (SSC) IS A NEW COMPANY FOCUSING ENTIRELY ON SOFTWARE ENGINEERING AND TECHNICAL OPERATIONS. THE BERLIN-BASED VENTURE IS THE NEW PLATFORM SOFTWARE HOUSE FOR ITS.



NEW SOFTWARE SOLUTION CENTER IN BERLIN

The SSC will make things easier for our customers with easier to understand and more integrated products based on a common platform in the future”, says Christoph Stögerer, Head of Technology with SWARCO’s ITS division.

The idea of the SWARCO Solution Center (SSC) is to join SWARCO’s forces and become more powerful in the transition to digital services, where software is a key factor. On the market in general, many existing software solutions were developed a long time ago and have

now to be considered outdated. At the SSC, new systems are built on modern architecture. “The main purpose with the SSC is to grow our software competence and to support our digitalization strategy,” says Stögerer.

Based in Berlin

The SSC is based in Berlin because of its big start-up scene and the possibility to collaborate with another Berlin-based SWARCO company, Schlothauer & Wauer. Their scope of work is to plan, advise and

engineer traffic control, traffic management, and technology. The main purpose is to collaborate with Schlothauer & Wauer on the development and integration of traffic management solutions, specifically analytics and the next generation of adaptive traffic management software. Some of Schlothauer & Wauer’s systems will be integrated in MyCity, the modular Traffic Management Platform the SSC is developing (read more on MyCity on pages 16 and 17).

“Berlin is the perfect choice, not only because of the amount of start-ups but also because Schlothauer & Wauer is based here. They are actually located just on the opposite side of the street, which gives us a lot of opportunities to team up in different projects,” says Stögerer. The SSC currently employs 20 software experts, with plans for a further gradual growth.

“We are building an agile team with a mixed background of technologies to be able to react faster to the changes in our industry and bring the various rich assets that exist as part of the SWARCO group together onto one state-of-the-art software platform,” concludes Stögerer.



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GREENFIELD AMSTETTEN

GROUNDBREAKING
CEREMONY FOR THE
"MANFRED SWAROVSKI
GLOBAL GLASS BEADS
TECHNOLOGY CENTER"

Manfred Swarovski laid the foundation stone for SWARCO in Amstetten in 1969. The success story "made in Austria" commenced in Lower Austria and led to SWARCO becoming a leading global player in various sectors of traffic technology. Today, the corporation looks back on five decades of history and employs some 3,800 people at several locations, with Amstetten continuing to be of particular importance as the company's birthplace. The name stands both for the core of future work in this center and naturally for the company's founder, Manfred Swarovski, who unfortunately passed away in 2018. His achievements are always held in high regard here, and his sustainable visions

are being borne into the future. And what will actually happen at the "Manfred Swarovski Global Glass Beads Technology Center"? The facility under construction in Amstetten will be a center of excellence with state-of-the-art technologies.

The competence center for glass technology in the field of road safety will generate in the future products that will ensure greater safety on roads worldwide. Some 70 experts will concentrate their research in Amstetten in a wide range of areas. Together with safety, particular importance will also be attached to the subject of automated driving with optimal guidance systems. SWARCO will play a decisive role in developing



Picture: Grubner/NON

Groundbreaking ceremony of „Manfred Swarovski Global Glass Beads Technology Center”

f.l.: Koloman Riedler (Riedler Kies und Bau GmbH), Dipl.-Ing. Manfred Heigl (Regional Building Authority), Andreas Illich (Plant Manager M. Swarovski GmbH), Mayor Michaela Hinterholzer (Member of the State Parliament and Councillor of Commerce), Philipp Swarovski (COO Road Marking Systems Division), Mayor Ursula Puchebner, Peter Tomazic (Managing Director M. Swarovski GmbH), Harald Mosböck (Head of Region Europe Road Marking Systems Division), Master Builder Markus Schnabl (PSB Planung-Statik-Bauleitungs GmbH)

this technology and shaping it with innovations. The Road Marking Systems (RMS) division will therefore be able to react even more efficiently to current market and customer requirements. However, continuous improvements in quality, customer service and product diversity not only take center stage at RMS. SWARCO Advanced Industry Systems is also prominently represented in the new competence center. You can find further information on this new line of business in a separate article on page 25 of this issue.

For Amstetten, the groundbreaking ceremony for the "Manfred Swarovski Global Glass Beads Technology Center" on the 26,000 square meter site means

another enhancement in the Group. But apart from the illustrious history, what does speak for the location in the Lower Austrian Mostviertel region? Amstetten scores particularly highly with its central location between Linz, Vienna, and Sankt Pölten. The very good transport connections in Lower Austria are also an important aspect for a company successful in the field of traffic technology. In addition, the employees profit from the scenic countryside, numerous recreational opportunities, and the strong infrastructure as regards healthcare and education. However, the whole region also benefits from the attractive workplaces in the Manfred Swarovski Global Glass Beads Technology Center. In short, it is a win-

win project for everyone involved. For SWARCO, for the employees, for the region, and, of course, for the road users all over the world. ◀



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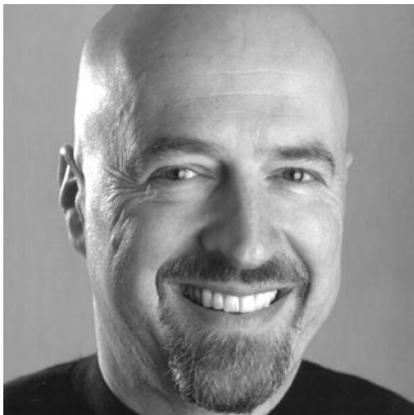
ROAD MARKINGS — FOR HUMAN DRIVERS AND FOR CONNECTED AND AUTOMATED VEHICLES

ROADWAY TRANSPORT IS ENTERING A PERIOD OF CONNECTED AND AUTOMATED VEHICLES (CAV) CAPABLE OF BASIC NAVIGATION WITHOUT HUMAN INTERVENTION AND BEING SIMULTANEOUSLY CONNECTED WITH EACH OTHER AND WITH THE ROAD INFRASTRUCTURE.

The CAV to function properly not only require computers and interconnection, but also machine vision that relies on road markings to properly position the vehicle.

Amongst the recent developments setting the stage for the introduction of CAV, the European Commission in its Third Mobility Package demanded that “Member States

shall ensure that road markings and road signs are properly designed and maintained in such a way that they can be easily and reliably recognised by both human drivers and vehicles equipped with driver assistance systems or higher levels of automation.” The newest edition of the North American Manual on Uniform Traffic Control Devices (MUTCD) is to contain a requirement for major roads that normal lines be 150 mm (6 inch) wide and markings more uniform, which was one of the main deficiencies for CAV implementation. These recommendations are very similar to the proposal of the European Union Road Federation, the “150×150 formula” for all roads: line width > 150 mm and retro-reflectivity (RL) > 150 mcd/m²/lx (under dry conditions; RL > 35 mcd/m²/lx under wet conditions), values earlier measured as a minimum for safe and comfortable driving and more recently found as needed for machine vision.



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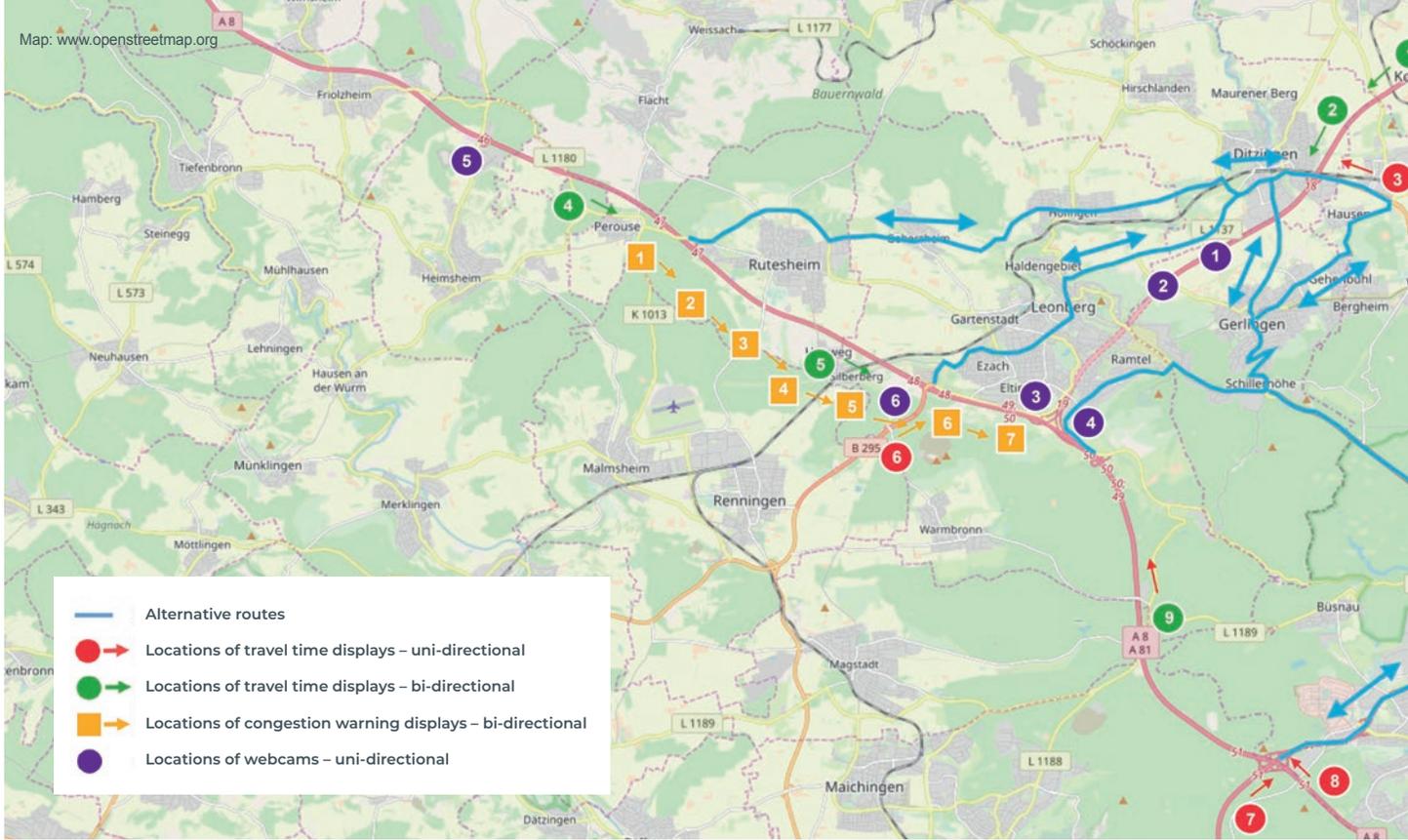
SWARCO provides road marking systems that meet and exceed the strictest demands for both human and machine vision, while being a sustainable solution.

High retro-reflectivity (RL), reaching even 1000 mcd/m²/lx in white paint and exceeding 100 mcd/m²/lx under wet conditions, can be readily achieved through drop-on SWARCO SOLIDPLUS or SWARCO DURALUX premium glass beads. In combination with a highly durable paint layer comprising materials like cold plastic, thermoplastic, or high-performance waterborne paint, a long service life can be obtained. This was demonstrated through test applications

done in Switzerland (structured cold plastic), in Poland (waterborne paint), and in the United States (yellow thermoplastic dots).

Several classes of road marking solutions (paint, tape, structured cold plastic), differing also in RL, were recently tested by SWARCO in cooperation with ZKW for their suitability to be read by machine vision equipment. The markings were evaluated under laboratory conditions in various conditions: daylight and darkness, dry, mist, rain, heavy rain, and fog, as well as with interfering light (glare effects) and in windy environment. It was found that camera and LiDAR complemented each other perfectly and their combination was sufficient to correctly recognise all road markings

with appropriately high RL. Whereas for a camera glare and low contrast ratio very significantly lowered marking recognition during daytime, these factors were not much hindering recognition by LiDAR. In darkness and under limited visibility conditions, retro-reflectivity played the major role for both camera and LiDAR. Human drivers — who are not to be envisaged to be quickly replaced by CAV, but rather accompanied by the new technology — also highly benefit from the same road marking feature that meaningfully facilitates their recognition by machine vision: retro-reflectivity. Hence, premium quality road markings, better readable by both human and machine vision, can ultimately be linked to increased road safety. ◀

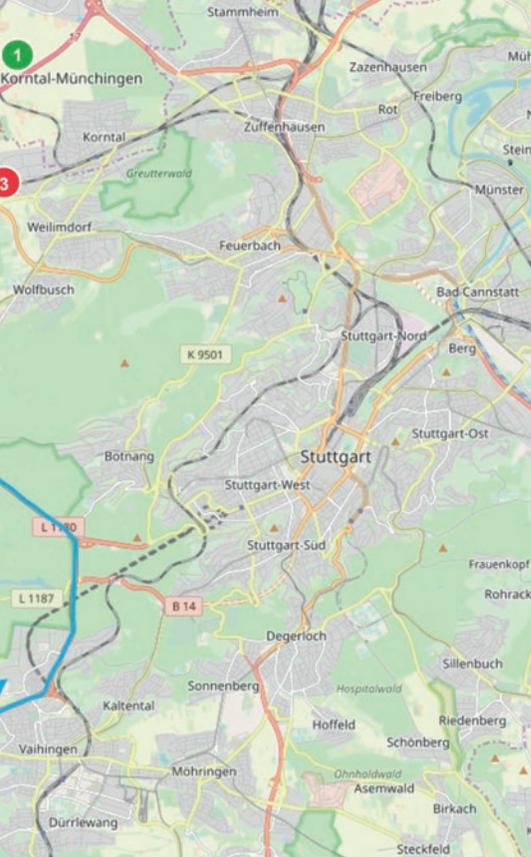


TRAFFIC MANAGEMENT FOR TUNNEL UPGRADE SCENARIO

IN THE COURSE OF THE REFURBISHMENT OF GERMAN ENGELBERG TUNNEL, A NEW TRAFFIC MANAGEMENT SOLUTION WITH CONGESTION WARNING AND TRAVEL TIME INDICATION IS BEING IMPLEMENTED.

The Engelberg Tunnel is part of German A 81 motorway and located north of the Leonberg motorway junction, linking the A 8 (E52) and A 81 (E41). The tunnel is of great importance as a link in the trans-European road network and serves several European regional corridors. Furthermore, the tunnel is part of the only efficient bypass of the capital of Baden-Württemberg, Stuttgart, with 110,000 vehicles passing through the two tubes every day. Between 2019 and 2024, the tunnel undergoes an extensive structural and operational upgrading. This causes

longer-term modifications in the course of the traffic, with re-routings to the opposite tunnel tube as well as closures of the tunnel at night. Traffic analyses have shown that congestion on the A 8 and A 81 motorways and on possible alternative routes is unavoidable, with traffic disruptions being very likely. Therefore, construction-related measures are planned in the form of an integrated congestion warning system and an integrated travel time display system. “The aim of both systems is to minimise traffic disruptions, related accidents and congestion, and to prevent the overloading of possible alternative



Picture on the left: Map overview; drawings by SWARCO, based on the tender documents

<p>Richtung Karlsruhe bis Rutesheim via 26 min via Ditzingen 48 min</p>
<p>Richtung München bis Leonberg via 26 min via Ditzingen 48 min</p>

Example of an integrated travel time display system (iRZAA): Diversion via Ditzingen B295

routes“, explains Klaus Hahn, Head of Sales Interurban with SWARCO. “We have been entrusted with the implementation of the control centres for the two systems. The overall system will be provided with further services in a working partnership.“

Integrated congestion warning system

Network control systems are already in place on the A 8 from Munich in the direction of Karlsruhe and on the A 81 from Heilbronn towards Stuttgart. In the direction to Munich via the Leonberg junction, there are no traffic control measures in place so far. The congestion warning system intends to integrate this area into the whole traffic system, starting already at the Rutesheim junction. LED variable message signs (VMS) will automatically warn road users of traffic jams and display the current speed limits. Seven VMS will be installed on both sides

of the roadway, plus two webcams for traffic observation purposes. By means of SWARCO’s tracking radar detectors of the type Caiman-PRO I mounted near the VMS, local traffic data are acquired, also when traffic comes to a standstill. An essential point of the system is the exchange of traffic data and VMS contents with the Road Traffic Centre of the state of Baden-Württemberg.

Integrated travel time indication

Traffic studies indicate that the measure will cause considerable congestion on the A8 and A81 motorways and possible alternative routes. For a targeted network control and to maintain the traffic quality on the alternative routes, the travel times on the two motorways and the alternative routes are displayed to the road users. The aim is to keep them as long as possible on the A 8 and A 81. All major access points to the Engelberg

Tunnel are therefore equipped with travel time displays. Information is conveyed automatically at 10 sign gantries with a total of 15 freely programmable RGB LED displays from SWARCO with a B6 wide angle optic. The visualisation of the travel time displays as well as the pictures of the webcams are published on websites of the state of Baden-Württemberg. ◀



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IMPROVED PARKING EXPERIENCE AT WARWICK UNIVERSITY

IN ITS COMPARATIVELY SHORT HISTORY, WARWICK HAS GROWN TO BECOME ONE OF THE UK'S LEADING UNIVERSITIES REGULARLY FEATURING IN THE TOP TEN OF ALL MAJOR DOMESTIC RANKINGS. HOME TO MORE THAN 27,000 STUDENTS AND AROUND 7,000 MEMBERS OF STAFF, IT HAS AMBITIOUS PLANS FOR ITS FUTURE.

It is currently working on its five-year plan to develop its campus and facilities, with a target of growing its student population by as much as 40% by 2030.

The plan involves various interrelated parts including the creation of a new Faculty of Arts Building, new student residences, the introduction of a new Sports 'hub' and the building of a National

Automotive Innovation Centre to create and develop technologies to reduce fossil fuel dependency and reduce harmful emissions. As part of the plan, the university also needed to upgrade its transport systems and in particular, improve parking facilities and parking management across the campus after identifying inefficiencies in its existing processes and parking strategy. One of the main issues it faced was co-ordinating

its traffic flow management. Drivers were struggling to find available parking spaces, causing unwanted congestion and a somewhat chaotic parking experience, especially during peak times. Ultimately the university needed to find a solution that not only reduced congestion, but also improved the user experience and maximised the available parking spaces across 27 on-campus car parks. It turned to SWARCO who in turn designed





solutions based on the very latest thinking and smart technologies.

SWARCO took a holistic approach, delivering a solution that encompasses both hardware and management software tailored to meet the needs of the university. SWARCO quickly identified that a lack of parking spaces was not the problem; the challenge was in identifying where parking was available and specifically signposting spaces that were vacant.

As part of the solution, SWARCO recommended a combination of different sign types to perform different functions. Parking guidance signs have been installed across the campus to display clear space availability arrows, featuring the number of free spaces in green or displaying 'full' in red. This enables drivers to clearly see whether spaces are available or not in a particular car park from a distance and take the appropriate, safe course of action. These signs are complemented with full colour Variable Messaging Signs (VMS), which can be utilised to display any image or text. The

VMS can therefore be used for multiple purposes, including providing parking and traffic flow information, site-wide safety announcements and to tell drivers and visitors of any events, maintenance works or road closures.

Intelligent data is sent to the signs by a series of car park counters and inductive loops that record all vehicles entering and exiting a car park. It means the data and status of the car parks are always up to date, enabling the university to better manage parking availability.

The entire site is being managed by a single hosted solution, SWARCO's intelligent Zephyr solution. The smart cloud-based software is specifically designed to provide customers with total control over their traffic assets and strategy. A web-based user interface enables users to quickly and easily edit message and pictogram displays at the touch of a button, as well as being able to upload new text and graphics as required. The platform can be used to access data on traffic, speeds and volumes as

well as set timetables, on/off times and provide key information such as power monitoring, LED monitoring and radar monitoring, all vital information on these safety critical signs.

Tony Gillings, Project Manager at SWARCO in the UK, said: "Working in close partnership with the University, we have delivered a complete smart parking solution and management system that has created a more coordinated and improved experience for drivers across the entire campus." ◀



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MYCITY IS A NEW
MODULAR TRAFFIC
MANAGEMENT
PLATFORM FOR
WHOLE CITIES – A WAY
TO GUIDE CITIZENS
FROM DOORSTEP TO
DESTINATION.



TRAFFIC MANAGEMENT FROM A BIGGER PERSPECTIVE

I strongly believe that if you want to manage traffic properly, you need to be realistic and not only manage car traffic but look at the big picture including all kinds of transportation,” says Christoph Stögerer, Head of Technology at SWARCO.

In the past, SWARCO has produced individual solutions such as urban traffic management solutions or parking solutions. MyCity is bringing different solutions together in a holistic approach, where the solution also works globally. “The customer journey runs from the moment a person leaves the door at

home until arriving at a destination. This can include everything from driving the car to a station, finding a parking spot, going with public transport and waiting for a red light at a pedestrian crossing before arriving. We want to guide the whole journey,” says Stögerer. To be able to do this, the traffic management system needs to know what is going on in different parts of the traffic, with everything from correct bus timetables to knowing the amount of free parking spots. This makes it possible to optimize the service and make the most out of the traffic.



This is how MyCity works

- **Integration platform** – including everything from traffic light controller standards to parking houses.
- **Responsive & Customizable Design** – addition of new functions and features and possibility to switch between different types of devices.
- **Data Management and Analytics** – managing data collected from a variety of detectors and sensors.
- **C-ITS Ready** – the possibility to connect existing infrastructure with vehicles and road users.
- **Adaptive Traffic Control & Network Adaptive Traffic Control** – solutions for strategy management like, for example, expected traffic volume.
- **Traffic Engineering tools** – integration of engineering tools for planning and evaluation of intersections, testing of traffic-actuated controls and simulation of traffic flow.
- **Single Sign-On** – a single sign-on solution for all SWARCO solutions going forward.

MyCity Monitoring

The first step is the module MyCity Monitoring. It is a merged version of the existing SWARCO products Omnia Basic, Topic and SWARCO Cloud. It is based on a modular and growing platform allowing the customer to add new functionalities. With MyCity, one single solution can be distributed globally with the possibilities

of local adjustments. “In order to handle the traffic, we need to have a good grip on the infrastructure – that’s why we start with monitoring,” so Stögerer.

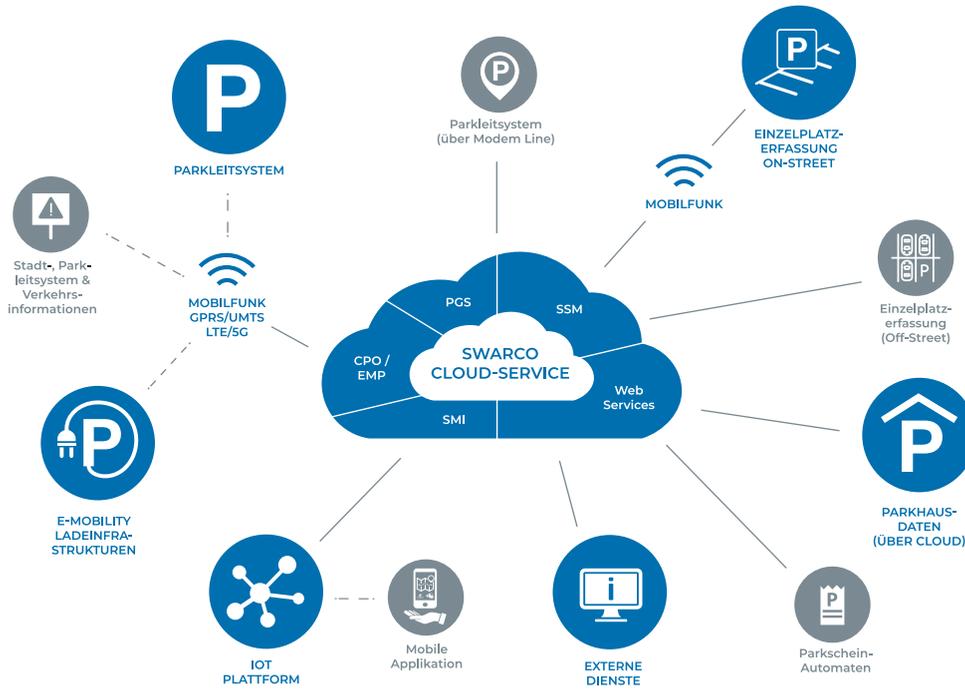
Flexibility

MyCity is an open platform where it is possible to support different solutions in the future – customizing it to both smaller

and bigger cities. A city can start small and add required functionalities when needed to improve traffic flow and safety or reduce service costs.

“We need to offer our clients the seamless integration of individual products, and with MyCity we are taking a step towards that”, concludes Stögerer. ◀





ORGANIZING URBAN MOBILITY WITH HOLISTIC PARKING MANAGEMENT

IN ORDER TO REDUCE THE AMOUNT OF TRAFFIC SEARCHING FOR PARKING SPACES AND THE VOLUME OF TRAFFIC IN URBAN ROAD TRAFFIC IN GENERAL, DECISION-MAKERS IN BUSINESS AND POLITICS NEED TO SET THE RIGHT COURSE TODAY.

Without the right framework conditions, it seems likely that isolated solutions will become increasingly widespread and that the necessary networking of systems will be inadequate. "Therefore, early traffic planning control impulses are necessary in order to optimally design parking space and traffic management solutions with regard to the entire traffic system in the city", explains Uwe Pertz, SWARCO's Head of the Business Unit Parking and E-Mobility in Germany. SWARCO's traffic and parking management solution is modular and can be tailored to the requirements of individual cities. By networking the individual modules via open interfaces, the city has many opportunities to enter the field of digitalization of flowing and

stationary traffic. Be it, for example, via a dynamic traffic and parking guidance system, a parking app or even single space detection in the car park or at the roadside: Everything is networked and can be combined with each other. Urban parking guidance systems show drivers the way to free parking spaces with the help of dynamic and static information displays. The occupancy status of individual parking facilities is recorded by sensors or barrier systems and then transmitted to the parking guidance computer via fixed or mobile communication networks. The parking control computer represents the central information logic for the individual applications and enables the operation of the entire system via a user interface. The parking computer and its software can be operated either by the city itself

as an on-premise solution or by SWARCO as a cloud solution. "As market leader in Germany, we have designed and built more than 190 parking guidance systems in German cities", says Pertz proudly.

An expansion to a fully comprehensive traffic and parking guidance system is achieved if additional data is imported from external systems such as the traffic management system INES, an already available urban traffic computer, currently measured environmental data, public transport timetable information data or traffic control systems. While the classic parking guidance system only shows the available parking spaces in the connected parking structures and parking quarters, the integrated traffic and parking guidance system can additionally provide flexible traffic guidance by delivering information on traffic disturbances, detour recommendations, etc.

In order to provide the most flexible traffic information possible, the majority of dynamic signage is designed as fully graphic, full-color LED matrix displays. These displays normally show parking guidance information, but can also indicate any other information if required (e.g. traffic disruptions, environmental pollution, events, P+R recommendations, etc.). In scenarios, the intelligent parking guidance software determines which display contents are to be switched when

a defined event is active. In general, all displays of the system can be influenced by a scenario.

PARCO (<https://parco-app.de/>) is a mobile application by SWARCO for Apple iOS and Android smartphones for finding available parking spaces, ticketless or cashless payment and for the settlement of parking transactions. PARCO supports drivers in planning their trips or - when on the move - to find, access and pay for the nearest free and cheapest parking space quickly and stress-free. The app already contains parking information of more than 1,200 cities in Germany, Austria and Switzerland and will be further expanded.

Always find the best parking space

No matter what the situation and environment - you tell PARCO where to go, the app does the rest. PARCO uses millions of data to determine the best parking options near the desired destination and displays the most important information on parking costs, occupancy status, opening hours, facilities, etc.

Head for the parking lot

Did you find the best parking space? Price, location and availability are

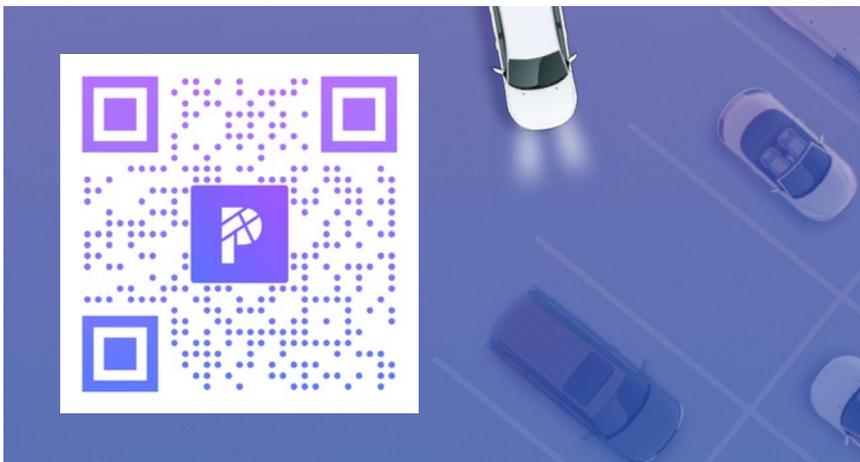
checked? Then PARCO will navigate you via the optimal route directly to the desired parking space.

Parking and payment

As soon as you arrive at the parking lot, the parking process is started by the user. The eternal search for change is over. With PARCO, a flexible online ticket is booked, which is paid for cashless via the customer account. The digital billing of parking processes is already offered via PARCO in 50 German cities. By the end of 2020, it will be about 130 cities in Germany and Austria. If desired, PARCO will navigate the parker to the destination and back to the car using "last mile navigation".

Conclusion

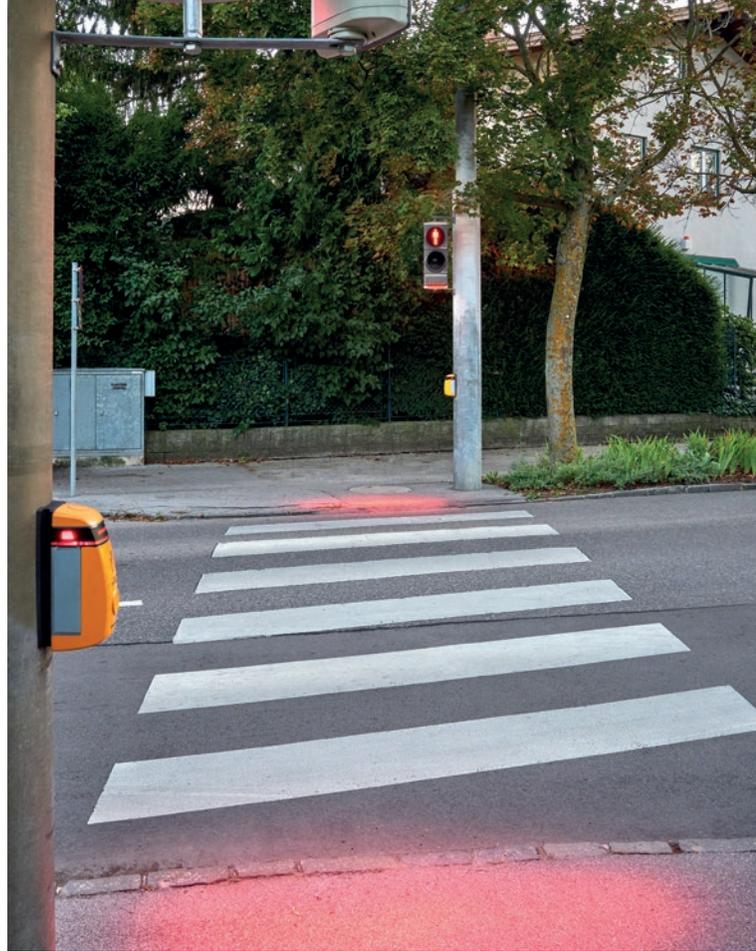
"In order to optimize parking search traffic and the overall traffic volume in urban road traffic in the long term, the networking of all solution components should be the focus of the overall planning of the traffic system", recommends Uwe Pertz. For this reason, in addition to the incentives for individual systems that have been available to date, targeted control impulses and framework conditions for holistic, modular platforms should be created. ◀



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MORE SAFETY FOR THE VULNERABLE ROAD USERS

COMPARED TO OTHER ROAD USERS, PEDESTRIANS ARE THE MOST VULNERABLE ONES IN ROAD TRAFFIC, FACING PARTICULAR HAZARDS WHEN CROSSING ROADS AND INTERSECTIONS.



Not only bad weather conditions such as fog, rain or snowfall increase the number of traffic accidents, but also the decreasing attention of pedestrians themselves. Especially younger road users are distracted from traffic around them by typing and swiping on their smartphones or listening to music via headphones.

For this reason, SWARCO has equipped its new COMBIA traffic light family with an intelligent feature to facilitate the perception of red traffic lights. With the **SafeLight** application, the red traffic light is additionally projected onto the pavement, producing a larger red spot that – depending on the position of the pedestrian – is also reflected on the smartphone display. SafeLight thus not only fulfils the function of a ground light, but also draws the attention of the so-called "smombies" - smartphone zombies who cannot take their eyes off their mobile phones - back onto the road.

SafeLight has already been installed in many European countries as well as in Saudi Arabia and makes a significant contribution to pedestrian safety.

However, it is not only mobile phone junkies who are particularly at risk in road traffic, but also cyclists and people with visual impairments who require additional assistance to cross signalised intersections safely. Acoustic assistance devices at intersections offer help to weaker road users. SWARCO's push-button **TOUCH SOUND** ensures clear and reliable signaling through acoustic and visual signals at pedestrian crossings. Regardless of the individual feature set of the push-button, its outer design always remains the same - one design for the whole city. The **TOUCH SOUND** push-buttons can be adapted to the individual requirements of an intersection in a city and are therefore appreciated as useful assistants all over the world.

INNOVATIVE TRAFFIC LIGHT FUNCTIONS

SWARCO HAS ALWAYS HAD THE ROLE OF A PIONEER AND INNOVATOR IN THE FIELD OF TRAFFIC SIGNALING. IN RECENT YEARS, THE COMPANY FOLLOWED THE IDEA OF MAKING INFRASTRUCTURE MORE "INTELLIGENT".

This includes the inclusion of previously separate trades and domains as well as the creation of new interaction possibilities between infrastructure and road users. Just as individual mobility is more diversified today than in the past (e.g. electric scooters and bicycles), the infrastructure must follow suit with new services. The creation of solutions for the integration of sensor technology can create a mobility system in which intelligence and sensor technology is installed at the "edges", directly at the pulse of traffic. In this way, novel functions can be offered at the intersections, which were previously not possible due to the centralization of the traffic management system. The users can thus be offered an optimization

of traffic flows and in some cases an increase of safety.

"These next steps include the integration of detection and sensoric devices into the signals for making the roads a safer place in general and for monitoring the air quality in the signal's vicinity", says Jochen Haspel, SWARCO product manager for traffic signals. "Therefore we proudly present two new products adding intelligent features to the conventional red-amber-green":

PedCom

While the demand-based activation of green times for road users (push-buttons for pedestrians, cameras/loop sensors for vehicles) has been part of road traffic for years, SWARCO plans to go one step further. With the help of an infrared-based sensor unit, the traffic light will detect objects and especially pedestrians both in the waiting area and on the pedestrian or zebra crossing and, if necessary, extend the green time for example when mobility-impaired persons (wheelchair users, elderly people with walking aids) cross the road. Likewise, if nobody uses the zebra crossing, the green time for the pedestrians will be reduced and thus the stationary time



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for road traffic shortened, which helps reduce pollutant emissions and optimize traffic flows. In order to meet the issue of data protection and anonymization, the sensor technology used should function on the basis of infrared images, which prevents the recognition of facial features, for example, in accordance with the "Privacy by Design" approach, from the outset. It is planned to use the same technology to detect (and count) vehicles.

AirDec

Air quality is an important indicator of the quality of life of the inhabitants of cities and towns. SWARCO is aware of the responsibility of traffic - especially of

stationary or slow moving vehicles - as an influencing factor on these parameters. With the climate change being a fact, the environmental monitoring and the collection of air quality data is of vital importance for generating an overall view on the status of a city.

So SWARCO developed AirDec, a modular environmental station integrated into the traffic light to measure air quality. This allows communities to establish a measurement network to monitor air quality. Through long-term monitoring, hotspots can be identified and possibly mitigated by appropriate traffic, organizational and planning measures. ◀



CUBILED - ADVANCED VMS TECHNOLOGY

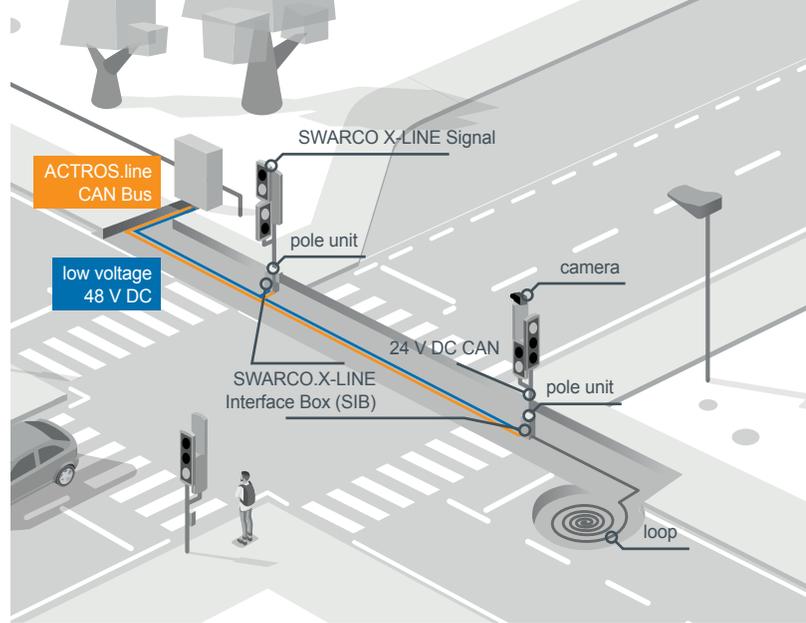
SWARCO IS THE INTERNATIONAL TECHNOLOGY LEADER IN THE FIELD OF LED VARIABLE MESSAGE SIGNS AND THEREFORE ALSO TREND-SETTING WHEN IT COMES TO FURTHER DEVELOPMENTS AND INNOVATIONS IN THIS BUSINESS SEGMENT.

With the new modular full-matrix variable message sign called CUBILED, SWARCO once again proves that safety and quality come first. CUBILED is not only characterized by highest optical performance, but also scores with its modular design, making it

suitable for a wide range of applications. Thanks to brilliant legibility, outstanding luminosity of the light dots and optimum stability of the housing, it is able to withstand all weather conditions such as rain, fog, heat or storms. Safety is SWARCO's top priority here as well.

WITH X-LINE, SWARCO
INTRODUCES THE
LATEST INNOVATION
FOR ENVIRONMENTALLY
FRIENDLY INTER-
SECTION CONTROL.

X-LINE YOUR INTERSECTIONS



Highly intelligent signal heads allow to take decisive steps towards even more environmentally friendly traffic signal systems with improved safety. X-LINE is the platform for a modern system that offers advantages in terms of efficiency and handling throughout its entire life cycle.

Citizens demand that their communities provide a modern and environmentally friendly infrastructure. This applies to all areas of life. Of course, it is also assumed that a modern system is accompanied by an improvement in safety and reliability. Functional safety and high availability are a matter of course. Intelligent networked

systems are omnipresent. The intelligent X-LINE signals allow extremely reliable control and especially monitoring of LEDs. Since the complete logic for this is implemented locally in the signal, highly efficient LEDs can be used. Thus the power consumption of the complete signal is in the range of 1-2 W. Since the conventional lamp switches and their power electronics are no longer required, additional energy savings are achieved. The adaptive control of the LEDs allows a constant light brightness over the whole lifetime of the system with best phantom light characteristics. Excessively bright signals in new systems are therefore a thing of the past. Future LEDs with even lower wattages can also be integrated into existing systems without any problems.

Since modern X-LINE components are operated at much lower power levels, the aging of electrical components is reduced and a stable power supply for the system can be provided more reliably. TÜV-certified safety (SIL-3) of the signals also contributes to the robustness of the systems.

Part of the past are now thick strands of power cables. This reduces laying and

wiring work, not to speak of a reduction in copper requirements. Simple connector solutions are now taking the place of a plethora of terminals. Existing cables, however, can still be used for the new technology. This will be noticeable to motorists due to reduced construction times and thus fewer disturbances and traffic jams.

As an open technology that can be used in components from various manufacturers, X-LINE offers cities high investment security.

"X-LINE is the future of signalized intersections" says SWARCO Vice President Stefan Seitz. "For cities and municipalities this means less energy consumption, less roadwork zones for the travellers and less traffic jams. Our systems provide the platform for intelligent solutions of the future. Be it new sensor technologies for monitoring air quality or the integration of cooperative or autonomous vehicles".

With X-LINE, operators reduce energy costs while improving safety and availability at the same time. X-LINE is therefore the technology of choice for the renewal or expansion of intersection control systems.



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SWARCO PRODUCT SYSTEM LIMBOPLAST D480

THE REAL ALLROUNDER
AMONG MARKING
SYSTEMS

There are quite a few innovative marking systems. But only some of them cover as wide a range of applications as SWARCO's tried-and-tested cold plastic Limboplast D480, which is approved by the German Federal Road Research Institute (BAST) as both a type I and a type II marking. The system, which belongs to the group of solvent-free, plural component, reactive markings, has proven itself both as a smooth paint as well as a structured or profiled marking. It also does not matter whether the markings are applied by extruder, screed box, or two/three-component application equipment. Their key characteristics are a long service life and high durability, even on roads with the heaviest traffic. Limboplast D480 is suitable for both bituminous and concrete substrates (priming required).



As a cold plastic, Limboplast D480 achieves extremely high nighttime visibility levels in the wet, above all as an agglomerate marking with stochastic and regular agglomerates, creating an outstanding drainage effect. Other benefits of this durable marking system include very good storage stability and viscosity stability levels as well as good edge formation of the structures, which can be regular or stochastic (irregular). Limboplast D480 is simply a real allrounder among marking systems.

The traffic-related properties are also remarkable, and this has been sufficiently demonstrated in many tests. Temperatures between +5 and +35 °C cause Limboplast D480 no problems at all. Alongside the long service life, road operators particularly appreciate the short curing time. It minimizes the road closure periods for traffic during marking work and demonstrates extremely high durability. Both structured and profiled markings, with their clearly perceptible haptic and



acoustic properties, exhibit high stability levels and good embedding of glass beads. The system retains its shape after the final curing process, and there is no chance of any changes due to external influences.

As a smooth paint, the cold plastic is mostly used as a conventional marking or, in challenging conditions, in combination with high-grade type II drop-on materials for better nighttime visibility in the wet. The perfect complement to Limboplast D480 in this case are the SWARCO SOLIDPLUS premium glass beads with their significantly higher retro-reflection compared to standard glass beads. Thus Limboplast D480 can very effectively emphasize its strength of long-lasting durability as a cold plastic and bring excellent traffic-related properties to the road. This has also been confirmed many times in BAST tests of all the aforementioned material versions and makes the combination of Limboplast D480 and SWARCO SOLIDPLUS unbeatable on all types of roadways.



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SWARCO ADVANCED
INDUSTRY SYSTEMS –
UNIVERSAL EFFICIENCY

SWARCO ADVANCED INDUSTRY SYSTEMS

We leverage the universal benefits of glass beads for your special industry applications, in energy-efficient ways. This is the mission of SWARCO's new business segment SWARCO Advanced Industry Systems. As the mission indicates, the new segment focuses on catering to industry perfectly by utilizing high-grade glass beads. Its product portfolio includes glass beads used as blasting media for cleaning, as filler material for plastic, or as additives for building materials, paints and varnishes. SWARCO Advanced Industry Systems offers solutions tailored to the client's needs and thus aims to become a first-choice supplier in this field. For SWARCO, the launch of this new segment is a decisive step towards a diversification and widening of its scope of activities.

SWARCO Advanced Industry Systems is currently part of the very successful Road Marking Systems Division. In the medium term, it may become a full-fledged division. The new segment was kicked off in summer 2019 with a business development concept, resulting in a specific business model with forecasts and a visualization of further development opportunities.

The preliminary concept also took the positioning of SWARCO Advanced Industry Systems into account. The segment's trajectory continued with more milestones. In the fall of 2019, a 19-strong expert team convened for a major strategy workshop, making the most of the wonderful atmosphere of the southern Mühlviertel region in Upper Austria to produce constructive outcomes. Most significantly, those include the detailed planning of the Go2Market process, a list of measures in all business areas along with a concrete action plan. In 2020, SWARCO Advanced Industry Systems will already enter the market in Germany, Austria and Switzerland, offering the full range of its products and services. Select parts of the new segment will also be represented in all of Europe and in the USA.

In order to implement this ambitious plan, the expert team has also presented a communication and identity plan. Press releases, key visuals, participation in trade shows and a variety of presentation media will ensure the new segment's media and market presence. To define its exact positioning within the industry, SWARCO

Advanced Industry Systems relies on its own philosophy. In addition to the mission, the vision, values and motto of the business segment have also been defined as part of its philosophy. Its vision is "Industrial glass beads by SWARCO Advanced Industry Systems – the world's preferred choice in all niches" and illustrates SWARCO's ambition with this new segment. "Efficiency", "diversity" and "intelligence", the values of this new product family, aim to convince prospective clients. And the motto clearly reflects what industry gets from SWARCO Advanced Industry Systems: "Universal Efficiency".



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MCCAIN 2020 – A LOOK BACK

AS WE WELCOME BERGAUER, THE NEWEST MEMBER OF THE SWARCO FAMILY, VALERIE HOFSTETTER LOOKS BACK ON THE ACQUISITION OF MCCAIN IN 2016.



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We have all heard the horror stories about mergers and acquisitions gone bad; the stories of massive layoffs, loss of control, discontinued products, no say in decisions, being left out of conversations, major changes, poor cultural fit, mismanagement, destroyed brand recognition and eroding market share. So how has McCain fared since being acquired by SWARCO? SWARCO founder Manfred Swarovski was very excited about the natural fit between the two corporations: "SWARCO and McCain have complementary rather than competing products and solutions, and strong synergies in terms of business ethics, culture, and corporate dynamics," he said.

McCain brought a fresh, uniquely American perspective to the SWARCO family. With a rich history and a culture that

inspires passion, loyalty, and innovation, these beach-loving Californians were eager to prove what good old-fashioned American grit could bring to the new world of mobility and its SWARCO family. And prove they did!

The purchase of McCain was one of the largest in SWARCO history and had great potential upside. "We plan to build upon the McCain brand and envision broadening the company's diverse product portfolio through the addition of many of our ITS products and solutions," explained SWARCO's executive for ITS, Michael Schuch. With access to SWARCO's vast portfolio of road marking and intelligent transportation management solutions, the first thing McCain grabbed onto was the precision-optic technology utilized in SWARCO's Variable Message Signs.



Amada Ensis4020 laser machine



1100 ton casting machine

New opportunities for growth

Variable Message Signs (VMS) promote road safety and awareness by providing travelers with information about unique driving conditions, events, or alerts. The acquisition allowed SWARCO to break into the US market and establish a North America manufacturing base for its world-renowned, patented and optically brilliant Dynamic Message Sign technology. Not only are the SWARCO-powered signs eco-friendly and reliable, they incorporate the latest technology to ensure compatibility with developing connected and autonomous vehicle (CAV) technology. For example, take our partnership with Caltrans, DENSO, and Qualcomm technologies to broadcast VMS messages to connected vehicles as part of the San Diego Regional Proving Grounds. The project shares messages posted on our VMS to the head-up display in connected vehicles; increasing safety by allowing drivers more time to make decisions.

The second new product offering that McCain incorporated into its portfolio was Parking Guidance Systems (PGS). Again, like Variable Message Signs, SWARCO had a large established Parking business

in Europe and were eager to grow the business in the US. OPTIPARK PGS was established as the McCain PGS offering and an entrepreneurial team was established to develop the market. Within months the newly formed team had success in the Corporate Campuses (Energy sector and a Social Media giant), Airports (San Francisco), Amusement Parks (Legoland), numerous Urban Parking facilities and Shopping Centers as well as the first Wayfinding system in San Jose. This smart-city solution for San Jose will be one of the most comprehensive wayfinding systems in the United States with the capability of directing travelers to more than 6,200 spaces in eight parking garages throughout the metropolitan area.

Expanded Production

SWARCO has enabled McCain to expand and enhance production facilities with major investment in production automation and new machinery including a 1100-ton Buhler Die Cast machine, Amada Ensis Laser machine, Toshiba Injection Molding machine and many more machines and countless upgrades. Production improvements have been implemented to advance the assembly flow throughout

the production line and minimize waste improving lead times and reducing costs.

Agile Development

One of the greatest advantages has come from the collaboration and cross-team cooperation in software development. SWARCO and McCain employ some of the best software engineers and developers in the industry and having these experts come together and work together on next generation products like MYCITY is extremely advantageous especially as we embrace new technology advancements and Connect and Automated Vehicles (CAV).

Brand and culture

As promised in negotiations, McCain has retained its distinct brand and culture and continues to thrive in the California sunshine. Since the acquisition, McCain has enjoyed year over year double digit growth together with hitting a major sales milestone in 2019. Being part of the SWARCO Group has offered McCain team members, customers, and distribution partners new opportunities for shared growth and success. ◀

The Lötschbergtunnel is one of the masterpieces in railway tunnel architecture. Bergauer developed, tested and integrated the tunnel supervision and control system.



SAFE INFRASTRUCTURES MADE IN SWITZERLAND

BERGAUER GROUP BECAME PART OF THE SWARCO FAMILY.

It was in April 2018 when SWARCO AG closed the transaction to acquire 70% of the shares of Bergauer Holding AG

from company owner Markus Bergauer. The group consisted of two operating companies: Bergauer Signalbau AG based in canton Zurich, and Bergauer AG in canton Aargau. Bergauer Signalbau AG, an installation company for traffic light systems, was merged with the existing SWARCO Traffic Switzerland GmbH to form SWARCO SCHWEIZ AG on 1 January 2019. This joint company is a general contractor for traffic signal systems, parking guidance systems and traffic data acquisition. Twenty-two employees managed by Daniele Bernardoni and Walter Hammer are successfully on course for growth.

The second company, Bergauer AG, continues under the same name. This company is proud of some heavyweight references, like the traffic control system of the city of Zurich or the control system of the 36.4 km long Lötschberg railway tunnel. As its core business, Bergauer AG develops and builds integrated software solutions for the safe operation of technical systems in public infrastructures. These can be traffic-related or building infrastructures,

or a mixture of both, e.g. a tunnel control system. The 42 employees develop the solutions in-house. This enables the two managing directors, Urs Friess and Daniel Meier, to guarantee customers maximum flexibility and Swiss reliability over the entire operating period. "The deal is a win-win situation," says 65-year old Markus Bergauer. "I needed a succession plan for my companies, and SWARCO wanted to expand in Switzerland". "When we first met in 2015, Markus kicked me out of his office", smiles Daniel Meier, who arranged the takeover. "But over time trust grew, and the turning point was the personal contact with Manfred Swarovski, from entrepreneur to entrepreneur", he continues.

Almost two years have passed since the takeover. The first stumbling blocks in growing together with the SWARCO Group have been successfully overcome. "The forming and storming phase should be over", says Daniel Meier. "Now the norming and performing phase will proceed with delivering the best solutions for safer infrastructures in Switzerland and across the entire SWARCO Group." ◀

NICARAGUA

IN THE PAST 8 YEARS, NICARAGUA HAS MADE GREAT STRIDES TO EXTEND ITS NETWORK OF PAVED ROADS, IMPROVE ROAD PAVEMENT QUALITY AND INTRODUCE HIGHER PERFORMING MARKING SYSTEMS TO RAISE THE LEVEL OF RETRO-REFLECTIVITY AND DURABILITY.

With this in mind, thermoplastic road marking products have become the product of choice, due to improved durability and long-term retro-reflectivity.

Since the Ministry of Transport and Infrastructure (Ministerio de Transporte e Infraestructura) has adopted higher standards for better performing markings, they have seen an improvement in night-

time visibility, retro-reflectivity and overall safety for the motoring public. In addition to improved markings and safety, the Ministry recognizes that investments in durable thermoplastic pavement markings provide a viable economic cost/benefit solution due to their long-term performance.

SWARCO's RMS Americas thermoplastic and glass bead systems were utilized on several projects funded by the Ministry of



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Transportation that specified minimum reflectivity and performance standards be met. These projects were successfully executed by LLANSA, an eminent road builder in Nicaragua, and by SEVIALNCSA, a renowned turn-key pavement marking contractor that applied the road marking installations throughout various regions of the country. Two of the higher profile projects are referenced below:



Project (1):

Mejoramiento del Camino Rama – Empalme Kukra Hill – Laguna de Perlas

Tramo II: Approximately 27 km.
Project executed in November 2019

Project location:
Región Autónoma de la Costa Caribe Norte de Nicaragua



Project (2):

Mejoramiento de los Tramos de Camino: Malacatoya – Victoria de Julio y Malacatoya – El Palo – El Papayal

Tramo I: Approximately 29 km.
Executed in 2019/2020

Project Location:
Pacífico Sur de Nicaragua

LESS TRAFFIC JAMS AND OVERCROWDED BUSES – INTELLIGENT TRANSPORT SYSTEMS ARE A KEY FACTOR IN MAKING CITIES ATTRACTIVE AND COMPANIES THRIVE. WOJCIECH GOJ, MARKETING MANAGER OF SWARCO'S ITS DIVISION, TELLS US WHY SWARCO IS MAKING BIG INVESTMENTS IN NEW TECHNOLOGY FOR CLEAN AND EFFICIENT TRANSPORTATION.



HOW SWARCO SOLUTIONS ARE BENEFICIAL FOR SOCIETY

Creating liveable cities

A lot of urban areas have problems with traffic jams, housing shortage and overcrowded public transport. Big cities struggle with the fact that if attractive job talents are to choose certain metropolitan areas and populate growing companies, the cities themselves need to be attractive for both the employees and employers. A city that cannot offer a good quality of life will scare off qualified labour from working at companies in said city – and in the end push companies away to establish themselves elsewhere. Therefore, it is vital for both cities and companies to have a reliable transport system, where both the traffic and people can easily move and thrive.



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How can Intelligent Transport System (ITS) help?

In the context of efficient cities and the costs to society, integrating ITS solutions and subsystems can make a great impact. This includes reducing traffic congestion, traffic accidents and air pollution, all of which cause high costs to society and poor quality of life.

ITS utilise the existing infrastructure without building new roads. Building new roads is not possible in most cities. not only because of the lack of space, but as it is also proven to be an ineffective, short-term solution, as new lanes fill up fast with more traffic. The challenges with traffic congestion and dangerous emissions are a tough nut to crack, but ITS solutions

can help in making the best out of our resources. It also gives authorities the tools to prioritise some type of traffic over the others and make public transport more attractive while simultaneously creating smoother flows in the existing network. That is what congested and air polluted cities need all over the world.

Saving lives

Another vital issue regarding traffic is road safety. A status report from the World Health Organisation (WHO) states that about 1.3 million people die on the world's roads every year, and as many as 20-50 million are injured. Road traffic injuries are the second biggest cause of death for all age groups, behind the total sum of various kinds of diseases in the first place, and for children and young adults aged 5-29 years it is the leading cause of death. On top of the personal trauma caused by accidents, road traffic crashes cost most countries approx. 3% of their GDP. ITS has over and over proven to be a life-saving technology not be underestimated in the context of societal costs. Highway, tunnel and traffic light solutions are the more obvious ones, but as society is more



and more switching to alternative ways of transport, we also place high focus on the vulnerable road users, such as cyclists, pedestrians and e-scooter users.

Besides road safety, traffic has another big issue by being a contributor to dangerous air pollution. According to the WHO, air pollution kills an estimated 7 million people worldwide every year. From these, 4.2 million deaths are a result of exposure to ambient outdoor air pollution. In other words, air pollution is a major contributor to public health problems worldwide. The healthcare costs of congestion-related dirty air in Europe have been estimated to be around 79 billion dollars, a number that includes diagnosis and treatment of illness, lost productivity and investment in different types of public health initiatives. Traffic congestion, road safety and air pollution are all factors that play a role in how attractive a city or region is and how citizens perceive their quality of life.

Reducing environmental impact: The climate crisis is acute, and we must reduce carbon dioxide emissions by 90 percent to meet the 1.5-degree climate target set by the Paris Agreement.

The transport sector itself stands for almost 30 percent of the carbon dioxide emissions in the European Union. Being a big part of the problem does not exclude the transport sector from also being a part of the solution.

“The transport sector accounts for 30 percent of the emissions, and ITS is an important piece of the puzzle to create a fast and real change”.

In 2015, the UN's 193 member states adopted the 2030 Agenda for Sustainable Development. These global goals are the most ambitious agenda adopted by the countries for a sustainable future for all, and an important starting point for battling

the acute climate crisis. ITS is a way for the transport sector to contribute.

How can ITS help reduce the traffic impact on our climate?

Fuel consumption and thus emissions strongly depends on the number of times vehicles stop and accelerate, and of course the number of vehicles itself. Ensuring that cars arrive at their destinations as smoothly and quickly as possible is key to reduce their environmental impact. Studies show that up to 30 percent of the traffic in urban areas are vehicles in search of a free parking place. With proper guidance solutions, drivers can be led much faster to a parking spot, which improves the traffic capacity on the road. Smart and well-coordinated traffic signals can help reduce fuel consumption and CO2 emissions by 10-20 percent while getting the drivers quicker to their destinations.

Prioritising buses and bikes are other ways to support the switch from private cars to alternative modes of transportation. A more attractive public transport system can lead to more people taking the bus and leaving the car at home. Bus priority solutions create more reliable timetables, fewer unnecessary stops and overall faster and smoother rides. Allowing cities to prioritise bicycles over the rest of the traffic will make cycling more attractive and this mode a safer, smoother and less chaotic experience.

“In the context of transport and climate, ITS will play a big role, as it streamlines traffic in a way that both saves time for people and reduces the environmental impact”. This means more time for other things, such as working or contributing to society in other ways. This, of course, is beneficial for the whole society.” ◀

SWARCO

The Better Way. Every Day.

You encounter us every day on the roads of our planet. At the traffic light, on the motorway, in a car park, at the charging station or on board of public transport.

Our products, systems, services and turnkey solutions offer orientation, information, safety and convenient travelling, and all this as environmentally sound as possible.

We improve quality of life for all people on the move. SWARCO's over 3,800 traffic experts are looking forward to elaborate and implement jointly with you the solutions that really meet your individual needs.

What can we do for you today?

