

# SWARCO DRIVEON

CORPORATE MAGAZINE | 1-2021

## NEW ON BOARD

A portrait of Australian road marking specialist Supalux

## SWARCO MYCITY

Our new urban mobility management suite

## HAMBURG CALLING

In-person event ITS World Congress

## READABLE ROADS

Preparing for the age of automated driving







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DEAR READER!

**W**elcome to a new edition of our corporate magazine DRIVE ON. We publish it right in time for one of the first post-pandemic in-person events of our industry, the ITS World Congress in Hamburg. Please read inside how SWARCO will be present there and what we are presenting on our exhibition stand.

We are very grateful to our esteemed business partners for their confidence in SWARCO also in the difficult times of the COVID-19 pandemic. As an operator in maintaining critical road infrastructures, we were able to keep up a strong course of business, making fiscal year 2020 a very successful one in our 5-decade history. We recorded a new all-time high in net sales of 758 million euros. For this, we would like to give a big hand to our 4,000 colleagues who did not slow down in delivering excellent products, systems and service to the stakeholders of our industry.

In order to further strengthen our position in both Road Marking Systems and Intelligent Transport Systems, we continue to seek opportunities to also grow anorganically through acquisitions. Over the past fifteen months, we were able to identify good fits for our family business, offering a lot of potential for joint positive growth and innovation. Recent examples of these are our new base Supalux in Western Australia and the intended take-over (still subject to the review by the antitrust agency) of Austria's market leader in road marking services, Eisenschutz.

Reading on, you will learn more about people at SWARCO, our SWARCO MyCity urban mobility management suite, the progress at our new production facility in Austria, our latest products and solutions, and our new Innovation Hub.

We look forward to meeting you in person again soon.

Yours sincerely,  
The SWARCO AG Executive Board



Michael Schuch  
Speaker | COO



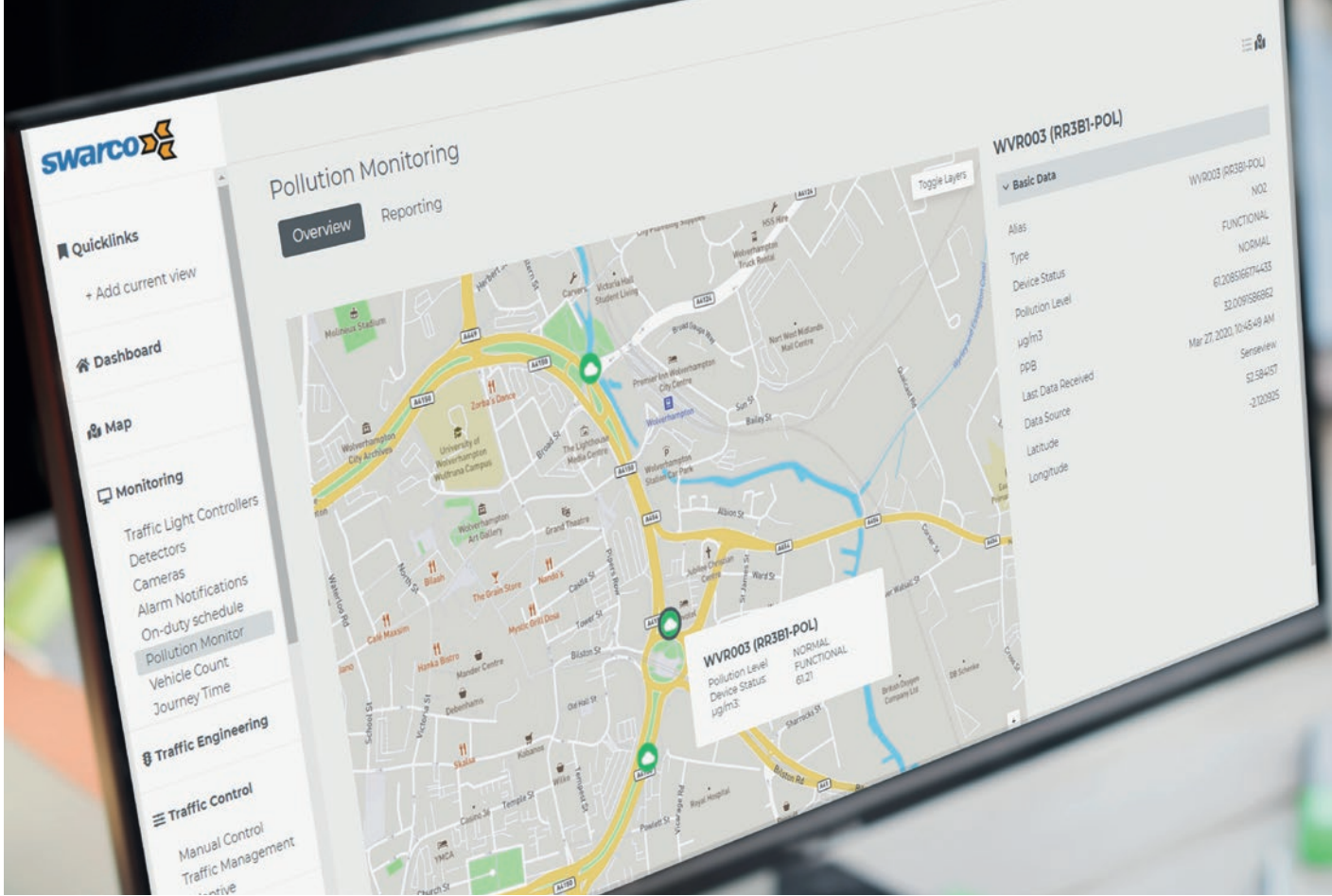
Günter Kitzmüller  
CFO



Günther Köfler  
CAO







# SWARCO MYCITY

THE URBAN MOBILITY MANAGEMENT SUITE FOR SMARTER, GREENER CITIES

The spring of 2021 marked an important period for SWARCO. After extensive research into current and future mobility needs, we launched SWARCO MyCity, our urban mobility management suite that is designed to tackle the most critical pain points of small, medium and large cities.

SWARCO MyCity has been designed and developed to tackle problems associated with two key challenges cities are facing: rapid changes to the types of urban mobility and the IT landscape needed to support it; and rapid urbanization and its impacts on urban environments. “Traditional forms of transport are steadily giving way to new ways of moving around

cities which presents a major challenge for city managers whose challenges have shifted to new paradigms which can no longer be answered via legacy products and traditional approaches of our industry,” says Michael Schuch, SWARCO’s Speaker of the Executive Board and Chief Operating Officer. “We developed MyCity to provide a flexible, scalable, modular, and future-proof technological infrastructure which supports current and upcoming forms of urban mobility management.”

MyCity also plays an important role in tackling the challenge of rapid urbanization. “By using MyCity, city leaders and urban mobility managers



live and work. All this is enabled via one, easy-to-use, intuitive and modular interface that just needs a single sign-on. Another benefit cost-conscious city leaders will appreciate is that MyCity is scalable, so new features can be added as and when they are needed.

### **Innovation via collaboration – the way forward**

According to Laura Cocone, SWARCO's Head of Innovation, the level of innovation displayed in SWARCO MyCity was not created in isolation, but in collaboration with a range of informed partners. "We created the SWARCO Innovation Hub to foster the ties between corporations, cities, industry associations, academia and research institutions so that we can shape together the future of mobility. We're aiming to create an ecosystem based on learning and interaction among stakeholders so that we can find the best ways to address the needs of users."

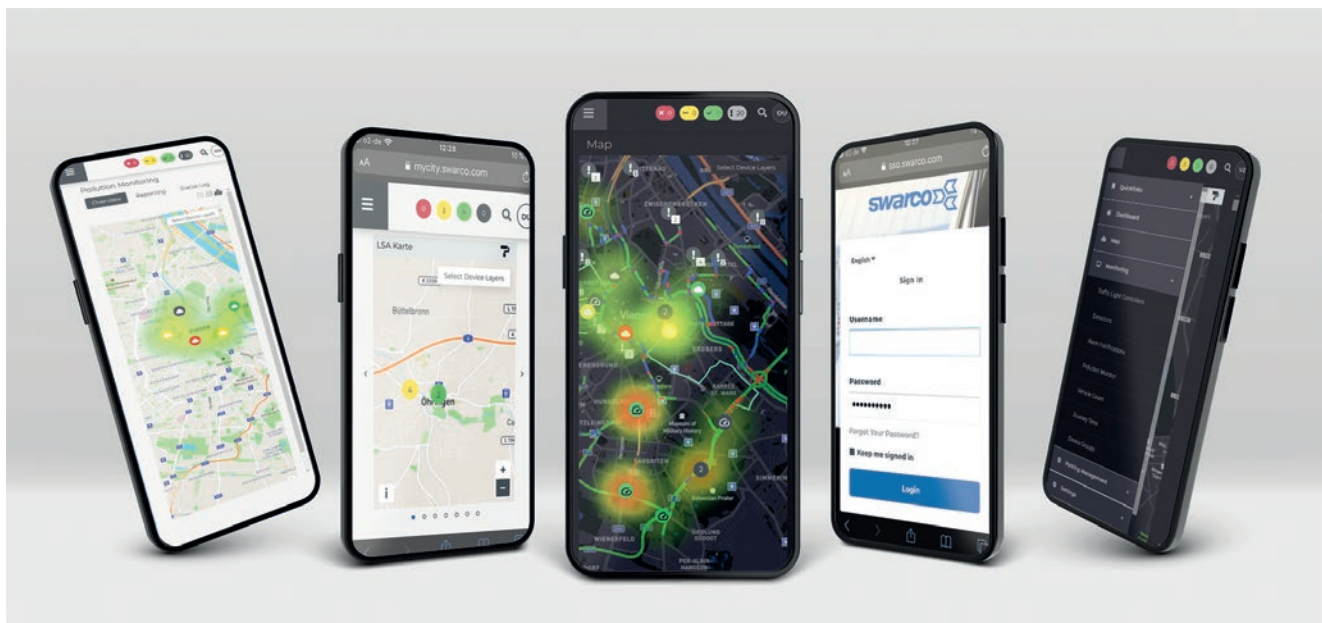
Globalization, faster development cycles and the increasing number of product features are a motivation to involve more partners in product and process development, which is why a

collaborative approach to innovation and product development has become routine in companies, including SWARCO. "Our Innovation Hub is proving to be a very beneficial initiative for everyone involved," confirms Cocone. "There are so many different stakeholders who have an interest in improving the future of mobility and making our cities better places to live and work, so why not collaborate and share knowledge to make this happen faster than one party trying to do it alone? Furthermore, we are convinced that meaningful innovation must happen via iterations in close and constant interaction with the users. This is exactly what we're seeing in our Innovation Hub."

### **SWARCO MyCity: developed in direct response to city needs**

Collaboration is a great way to collectively solve problems, but first it is important to know exactly what problems need to be solved. Niko Stieldorf, SWARCO's Global Business Development Manager for Software Platforms, explains how SWARCO did this. "We wanted to use our domain expertise to help city leaders make the right decisions, but before we

get the help they need to improve traffic flows, lower the risk of congestion and accidents, reduce air pollution, make better use of existing infrastructure, and shorten travel times", adds Schuch. It makes more people choose alternative forms of mobility and generally contributes to cities becoming cleaner, safer, and more attractive places to







could do this we needed to understand the problems from their perspective and get a clear idea of which way the market is moving. We spoke to clients in 420 cities across the world and found out that the problems generally revolve around coping with rapid technological changes connected with urban mobility and the pressing need to make their cities better places to live, work and invest. SWARCO MyCity was developed in direct response to these needs and I believe that what we've created is unique."

### **The pace of technological change is hard to keep up with**

Niko Stieldorf knows about the changes in urban mobility and how these changes are affecting the market. "The first signs of mobility-as-a-service such as Uber took a few years to have an impact on how people move," he says, "but now micro-mobility companies are literally popping up over night and strongly influence how we tackle our first and last mile." This type of disruptive innovation will continue, and this is why cities need to look beyond the perfectly engineered and customized

product that can last for ten or more years and instead opt for a modular and flexible system that can be quickly and easily adjusted to emerging technologies and urbanization. "City leaders can no longer be reactive and wait to see what trends emerge. They can't afford to adjust to changes every decade or so but need to have the right technology in place that allows them to proactively welcome changes and the benefits associated with them. They need the type of urban mobility management technology to evolve as mobility evolves. This is exactly what MyCity has been designed to do". Another important benefit of the tool is that it allows city operators to make better use of the existing infrastructure instead of envisaging the costly alternative of building more roads.

### **Smart cities need fewer silos and more data sharing**

The extensive research conducted by SWARCO highlighted that an important requirement for creating smart, connected cities is the capability to share and process data from different systems.

At the moment, most cities struggle to manage the operations needed to maintain numerous, complex interfaces and the range of different data sharing agreements that comes with this. This results in too many siloed systems within the same city. "What we found out in talking to city operators is that they need a reliable vendor who not only serves as the aggregator of mobility-relevant data sources but adds value by serving as a trusted single point of contact to manage the large variety of interfaces from a technical and also contractual perspective," explains Stieldorf. "They require systems that tackle mobility from a holistic point of view. Things like air quality, an improved experience of shopping downtown, getting home safely after a sports event, taking the kids to school, or getting smoothly to and from the airport in case of an evacuation are no longer activities that are independent from each other," adds Stieldorf. "Cities want and need to see these and many other urban activities as connected, and they need the technological infrastructure to make that happen."

### Cybersecurity – a growing threat that cannot be ignored

It is impossible to talk about smart cities, data management and connected urban mobility interfaces without mentioning cybersecurity. “The only way to cope with the changes we’re experiencing in our towns and cities is via a centrally hosted system”, underlines Stieldorf, who knows that maintaining a local infrastructure that needs constant supervision by highly trained experts is unfeasible for the average city. This is exactly what SWARCO MyCity is and what is also the best way to deal with the ever-present need for cybersecurity. Moving to a secure cloud-based system has long been best practice in other industries with high security needs, such as online banking, stock trading, or the healthcare system, which is why MyCity has done the same. “Almost 80% of the city managers we spoke to understand that they need to outsource such critical infrastructure and move to a subscription-based hosting environment exactly like MyCity. This gives them added peace of mind where cybersecurity is concerned.”

### Balancing rapid urbanization with sustainability

Cities around the world are struggling to cope with the impacts of rapid urbanization. Huge increases in day-to-day traffic flow mean more congestion and higher levels of air and noise pollution. In the past, pollution was an acceptable by-product of urbanization, but with rising temperatures and more than three million premature deaths annually linked directly to air pollution, that mentality has changed. SWARCO MyCity has been designed and developed to help respond to this growing problem.

Sustainability goes hand-in-hand with discussions about urbanization, so it comes as no surprise that it was the

second of the two major challenges the cities contacted by SWARCO face.

“Cities are having a hard time meeting air quality goals, and this costs the global economy around €1 trillion per year alongside the related health problems,” says Stieldorf. “We know that about one third of cars are driving around looking for a place to park, causing congestion and contributing significantly to air pollution. The traffic management system that is part of MyCity helps to get smoother traffic flows, and then you can add the parking guidance system to show drivers in real time where they can park. “And, of course, MyCity comes with the option of air quality monitoring, so operators can quickly react when CO<sub>2</sub> or nitrous oxide emission levels are too high.”

“With pollution monitoring that notifies us when NO<sub>2</sub> reaches a certain level, vehicle counting for 19 different classifications (including motorbikes, public buses and taxis), a live map view of the congestion of routes and journey times, and in-depth reporting from millions of data points, we are provided with unsurpassed knowledge of how the network is performing”, says John Charles, Team Leader Road Safety & Sustainable Travel at Wolverhampton City Council in the UK. “This increased intelligence, enhanced communication channels and the ability to automate processes allows us to identify and respond more efficiently to incidents occurring across the city, making us better placed than ever to manage the highway network and support the regeneration of a cleaner, smarter city.”

The urban mobility management software has been developed to make city streets cleaner and more user-friendly for drivers, public transport passengers, cyclists, pedestrians and all

other people who live there. It will help to improve the quality of life so more people are attracted to work there. “The SWARCO MyCity mobility management suite should be part of the sustainability strategy of any small, medium or large city,” recommends Stieldorf, “because it really does play an important role in making our cities cleaner, greener, safer and better places to live.”

### Easy deployment and “try before you buy”

The SWARCO MyCity urban mobility management suite offers all this on one platform, with a single interface. The fact that it is modular and includes different solutions means that it is scalable, and SWARCO will continue to develop needed solutions for cities of all sizes, also for their project-specific requirements. And the technology, like any cloud-based infrastructure, is constantly updated so it never becomes redundant. On top of all that, MyCity is also very easy to deploy, which is good news for cities that have not yet had time to fully utilize this year’s budget. They can test MyCity before committing to pay for it and deploy it before the year-end when they feel happy with the solution. Can you imagine what your city would gain from it? ◀



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# NEW SWARCO FACTORY IN AUSTRIA TAKES SHAPE

IN OUR 2020 ISSUE, WE ALREADY WROTE ABOUT THE GROUNDBREAKING CEREMONY FOR OUR NEW FACTORY ON THE OUTSKIRTS OF AMSTETTEN IN LOWER AUSTRIA. IN THE MEANTIME A LOT OF PROGRESS HAS BEEN MADE IN BUILDING THE NEW SITE THAT ALSO SETS NEW STANDARDS IN TERMS OF ECOLOGY.

Our colleagues in Amstetten already look forward to move to the new premises this autumn. The new SWARCO Global Glass Beads Technology Center is rapidly taking shape and will offer modern and inviting office space, an informative showroom, and above all state-of-the-art production facilities for glass beads used in road safety and for industrial applications. “The plant is supposed to take up operation in early 2022”, says Andreas Illich, Managing Director of M. SWAROVSKI GmbH, who is deeply involved in the project implementation.

At the end of August, all building shells were closed, the last floors laid in the office building and the interior design started. Already since the end of June, the electrical infrastructure and the IT network landscape have been in operation, and the local water supply connected. “The construction of the

plant technology consumed more than 1200 tons of steel for bead blending facilities, melting tanks including batch preparation, shaft furnaces and granulate processing”, reports Peter Tomazic, VP Europe (Production/R&D) of the RMS Division and technical mastermind of the new production site. “We are happy that the cooperation between all craftsmen and trades involved works very smoothly. It is a great advantage that we are able to cooperate with local and regional providers who act in concert.” Until the end of November, the team hopes to have finished the outdoor facilities with curbstones, asphaltting of paths and roads, landscaping, and fencing. The new SWARCO Global Glass Beads Technology Center will not only use state-of-the-art manufacturing processes, but also house the Road Marking Systems

Division’s Center of Competence with modern laboratories and pilot and testing plants. With the new technology and the increased level of automation, SWARCO sets a milestone to increase customer satisfaction and improve service. A well-trained team works both on proven products lines and innovative products, taking particular care of energy-efficient and low-emission manufacturing processes.

“We are fully aware of our corporate social responsibility and the need for sustainable manufacturing”, underlines Peter Tomazic. “That is why we not only invest in product developments to increase road safety and meet the needs of our customers, but also in research projects aiming to develop new processes with a particularly small ecological footprint.”







# SWARCO GOES HAMBURG

WE ARE LOOKING FORWARD TO BE BACK AT AN IN-PERSON EVENT AFTER 18 MONTHS OF PANDEMIC-RELATED EXHIBITION LOCKDOWN. ON ITS STAND B5.120 AT THE HAMBURG FAIRGROUNDS, SWARCO WILL PRESENT THE FULL SPECTRUM OF ITS CAPABILITIES IN SUSTAINABLE URBAN MOBILITY MANAGEMENT.

This ranges from smart traffic lights and controllers via parking solutions to the new software suite SWARCO MyCity to manage urban traffic and environment with a single, device-independent control platform. The Green Wave for micromobility will be on display, as will the new COMBIA LED traffic signal generation with smart add-on features. Visitors will also learn how intersections can be designed in a more environmentally friendly way. The keyword in this context is SWARCO X-LINE. Traffic planning, engineering and consulting expertise will be represented at the stand as well as the future oriented topic of Cooperative, Connected and Automated Mobility (CCAM).

A premiere on the exhibition stand will be the novel LED variable message sign generation called CUBILED. This new product gives flexibility to road operators who need dynamic signage on a smaller scale with less demanding configurations.

The practical modular setup made of standardized cubes allows to compose VMS of various sizes. Of course, the new VMS builds on the patented cutting-edge and highly energy-efficient optic system the SWARCO customers are used to. SWARCO demonstrates world market capability with its ITC-3 controller that interfaces with all major standards and traffic management systems such as SWARCO MyCity, SCATS, SCOOT, NTCIP, Omnia, SPOT/Utopia, AENOR,

OCIT, RSMP, STREAMS and CCOL/Ivera. Besides contributions to the Conference Program and being part of EU-funded research projects, we will offer demo drives on the 9 km test track for automated and interconnected driving (TAVF) in the public urban traffic area of Hamburg. SWARCO demonstrates an “individual green wave” application based on a Traffic Light Forecast (TLF) service in the context of Environment Sensitive Traffic Management (ESTM). ◀



ON ITS EXHIBITION STAND AT THE ITS WORLD CONGRESS IN HAMBURG, SWARCO PREMIERES ITS NOVEL LED VARIABLE MESSAGE UNDER THE MOTTO "BRILLIANTLY SIMPLE, SIMPLY BRILLIANT".



# CUBILED – THE MODULAR VMS

SWARCO has been well known for excellent variable message sign technology for several decades. Countless motorways across Europe and far beyond feature the VMS in numerous project-specific dimensions with either fixed sets of symbols or freely programmable full-colour texts and graphics. The engineers of SWARCO in Austria have now developed a new product that introduces more flexibility, modular design and short delivery and installation times to the market of dynamic signalisation: CUBILED.



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"The idea behind it is that our customers now have the option to compose the LED VMS they need from standardised cubes", explains product manager Armin Peter. "This is particularly interesting for small-scale projects with less complex configurations. The easy scalability of CUBILED allows you to choose the cubes according to the height and width you need. Should you wish to make your VMS bigger one day, just add more CUBILEDs and a new frame".

CUBILED is offered as a standard kit of parts (cubes, frame, controller, cabling) easy to install with local added value, thanks to the practical quick-release fasteners of the cubes. The compact plug-and-play design also leads to lower transport costs and easy maintainability. The full-colour and fully graphic cubes have been developed for simple installation and for extending individual LED variable message signs. "You can use full-colour fully graphic CUBILEDs for temporary installations and re-use the parts in a different configuration later on", says Peter. "Of course, the new VMS builds on the patented cutting-edge and highly energy-efficient optic system you

are used to from SWARCO. This ensures brilliant display over a very long lifetime of the sign. Needless to say, all SWARCO CUBILED components comply with the EN 12966 specifications."

Artur Pesendorfer and Martin Ha, Managing Directors of SWARCO FUTURIT, hint at further advantages of this modular approach in VMS: "The compactness of the product facilitates storage. That is why we are able to ship CUBILED from our factory in Austria within a week and quickly react to customer-specific requirements, order modifications and new projects. Our customers thus get more flexibility for their own business models and ideas in terms of dynamic signage."

**Modular VMS:** based on Cubes  
**Cube dimensions:**  
 320 × 320 × 100 mm  
**Display:** Fully graphic and full colour (RGB)  
**Pixel pitch:** 20 mm  
**Standard:**  
 EN 12966:2014 + A1:2019  
**Light source:** Top-quality LEDs from well-known manufacturers and patented lens system



# ENVIRONMENT SENSITIVE TRAFFIC MANAGEMENT

CLEAN AIR IN CITIES WILL CONTINUE TO BE AN IMPORTANT ISSUE IN THE FUTURE. IN ADDITION TO MONITORING NO<sub>x</sub> LEVELS, PARTICULATE MATTER POLLUTION IS ALSO MOVING INTO THE FOCUS OF EU LIMIT VALUE REGULATIONS. ANDREAS SCHMID FROM SWARCO'S INNOVATION TEAM EXPLAINS WHAT MATTERS IN THIS CONTEXT.

It is well known that traffic is responsible for a considerable share in the pollutants, some 30 - 50% of the immissions are generated by local traffic. The first step usually taken in environmental and traffic management is measurement. Depending on the objective, this may involve highly accurate standardised measurements to prove compliance with the limit values (25 - 50% permissible deviations from the real value), or it may involve orienting measurements (50 - 100% deviation), or it may involve a general overview (>100% deviation) of the pollutant situation. These value ranges are specified in Annex 1 of Directive 2008/50/EC.

In traffic management, the resulting immission is the target value. Unlike many other parameters such as traffic volume or speed, the measured immission is only conditionally suitable as a starting point for measures. The reason: Due to processes in the air chemistry and the interaction between the various environmental parameters (humidity, solar radiation and the resulting ozone), the immissions only occur long after the causal traffic event. Nevertheless, the interrelationships are known, and with a skilful approach, suitable measures can be found a priori (i.e. before the immissions occur), which effectively help to reduce the pollutants:

## Interrelationships

1. Traffic volume (weighting factor 1) - and especially driving dynamics (weighting factor 4) contribute to emissions.
2. The weather (solar radiation, wind) influences the strength or the temporal and local offset of the effect.

## Procedures

### • Measure and display.

All three degrees of measurement accuracy can be used to represent the immission load. If measurements are to be used as input parameters for calculations, it is important to know the requirements resulting from the objectives of the calculations. For this purpose, the mobility platform "SWARCO MyCity" can offer monitoring with traffic light integrated "AirDec" sensors or integrate precise measurement support points for orienting measurements with the "Immissions Monitoring Box (IMB)" from Bosch.

### • Calculate and influence.

To influence traffic in order to reduce emissions and thus also immissions, the relationship between the dynamics of traffic and the resulting change from a specific measure must be mapped. The sole measurement of immission as an input variable is not sufficient. The time lags in air chemistry and also the preci-



sion of the measurement cannot map the connection between cause and effect for a bundle of measures. Measurements of the dynamics of traffic (microscopic vehicle movement data) are suitable as input variables. The Environment Sensitive Traffic Management (ESTM) method from Bosch provides traffic-related emission analyses from this. These and data from measuring point forecasts can be converted into measures in the SWARCO MyCity strategy management, in the INES control procedure or in the Traffic Light Forecast app from T-Systems, which represent a reduction potential of up to 20% for emissions such as NO<sub>2</sub>. ◀



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# SWARCO AND LIME PARTNER TO IMPROVE STREET SAFETY CONDITIONS FOR BIKE AND SCOOTER RIDERS

JOINT PILOT PROJECT FOCUSES ON REDUCING CONFLICT BETWEEN CARS AND MICROMOBILITY USERS AT INTERSECTIONS TO BETTER PROTECT VULNERABLE ROAD USERS

**A**ustrian traffic technology corporation SWARCO AG and San Francisco-based Lime, the world's leading provider of shared electric vehicles, have joined forces to improve the safety of vulnerable road users travelling with e-scooters and bikes. The companies will bundle their respective expertise in traffic management and environmentally friendly mobility services in a pilot project to reduce the traffic crash risk of micromobility users at traffic light controlled intersections.

“As a specialist in mobility and intersection safety, SWARCO is well positioned to help cities offer a safer environment for their new mobility carriers like e-scooters, in particular at those blackspots and conflicting zones where pedestrians, vehicles, e-scooters, bicycles and other modes meet”, says SWARCO Speaker of the Board and COO Michael Schuch. “We now team up with the major service provider Lime in order to develop safety solutions for the growing number of micromobility users.”

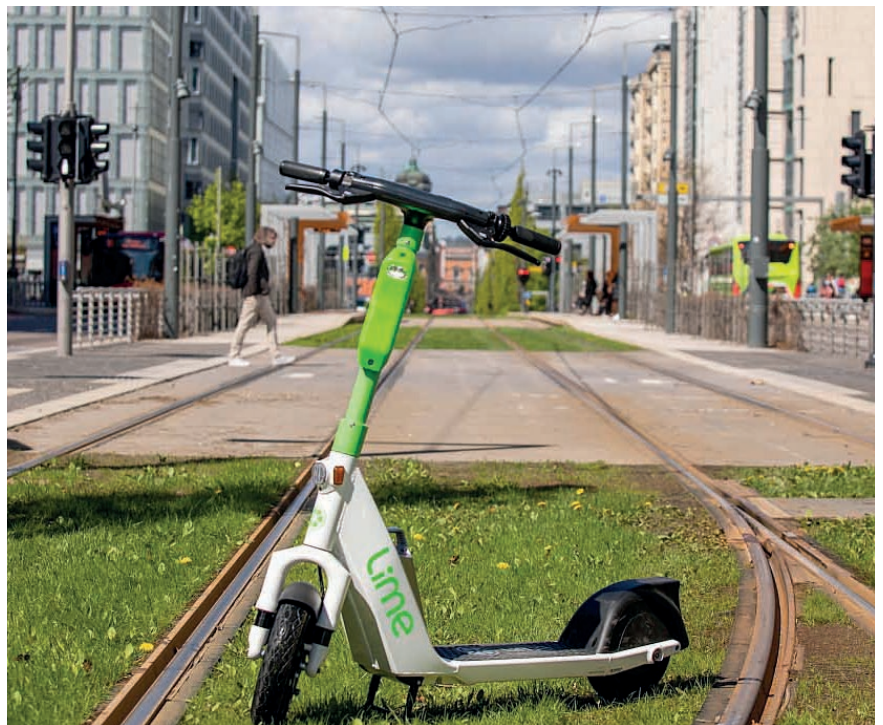
The joint pilot project, labeled Inter-

section Risk Mitigation, aims to optimize SWARCO's adaptive traffic light management algorithms to improve the safety of vulnerable road users and enhance traffic efficiency for drivers as well. SWARCO will leverage Lime's extensive and unparalleled anonymized ridership data to develop insights and potential countermeasures like adjusted crosswalk timing algorithms to support safer road conditions, especially for vulnerable users of micromobility. SWARCO and Lime look forward to working with City partners to implement data-backed safety measures.

“We know that intersections are key areas where conflict between cars and micromobility users are more likely to occur, which is why we're excited to partner with SWARCO to reduce

the potential for crashes,” said Annie Chang, Director of Safety Programs at Lime. “We're encouraged by SWARCO's leadership in providing traffic management solutions throughout Europe and believe that with Lime's unparalleled expertise in micromobility data, we can make a real impact in improving safety for all road users, including pedestrians, cyclists and scooter riders.

“Lime and SWARCO will engage with municipalities to create these Intersection Risk Mitigation Solutions”, explains Christoph Stögerer, Head of Innovation & Technology with SWARCO's ITS Division. “This helps to understand current challenges firsthand from the stakeholders affected and evaluate the capabilities of such solutions under real life conditions.”







A COMBINATION OF COLD PLASTIC AND PREFORMED THERMOPLASTIC MARKINGS IS SWARCO'S ANSWER TO THE CHALLENGING INTERACTION BETWEEN NON-MOTORISED AND MOTORISED TRAFFIC.

Clearly visible markings are better at attracting the attention of motorised road users, making bicycle lanes safer.

# SAFER CYCLING

Cycling is fast, healthy, environmentally and climate friendly, affordable, and has been extremely popular for many years. This makes bicycles an unbeatable means of transport for short distances. And yet, unfortunately, in many places, safety literally falls by the wayside," Andreas Nagel, Product and Sales Consultant at SWARCO Road Marking Systems, knows. The use of innovative marking systems is an efficient way to enhance safety on bicycle lanes. "In urban areas, in particular, these systems have proven highly effective. We recommend using a combination of several solutions to pool the advantages of individual materials," Andreas Nagel says.

## An Innovative Combination for Greater Safety

SWARCO Road Marking Systems relies on combining its own products for marking bicycle lanes. "The Roller Plastic RP 15 and our EUROTHERM preformed thermoplastics are optimally adjusted to each other," Andreas Nagel explains. The cold plastics, which are practically solvent-free, offer excellent skid resistance. This

is achieved through coarse fillers and an application technique involving rolling with a lambskin roller for finishing. The subsequent use of anti-skid materials is therefore no longer necessary. The Roller Plastic RP 15 is also more UV-stable than other markings and can be used on asphalt, but also on concrete, if used together with a primer. This makes it the ideal material for bicycle lanes, EV charging stations, zebra crossings and other large-surface markings. "And EUROTHERM complements it perfectly. As preformed thermoplastics, there are virtually no bounds to the range of possible designs. They are always quick and easy to apply," Nagel continues.

The highly versatile EUROTHERM material can take on many different shapes and colours and is often applied as traffic symbols, corporate logos or legends. The design of the shapes is finalized in the factory beforehand so that they can be applied onto the roller plastic directly. Thus, work involving stencils or masking off the area becomes obsolete. This saves valuable time and minimizes traffic congestions caused by road or lane closures.

## Advantageous Synergy Effects

The combination of the Roller Plastic RP 15 and EUROTHERM preformed thermoplastics provides for a thick-layer, abrasion-resistant, and thus durable marking. For road operators, this means significantly lower application times and a longer service life. In addition to these economic advantages, cyclists, in particular, benefit from this system. Thanks to the clear markings, they can enjoy their dedicated lanes more safely again, with optimal skid resistance even in wet conditions as a result of the combination's properties. ◀



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ONE OF THE CONSEQUENCES OF THE PANDEMIC HAS BEEN THAT WE WERE NOT ABLE TO RECEIVE VISITORS IN OUR PERMANENT SHOWROOM AT THE HEADQUARTERS IN WATTENS. SO WE USED THE TIME SINCE AUTUMN LAST YEAR TO IMPLEMENT A TECHNICAL UPGRADE IN ORDER TO BE ABLE TO SHOW SWARCO'S LATEST COMPETENCES IN INTELLIGENT TRANSPORT SYSTEMS.



# SWARCO TRAFFIC WORLD IN NEW SHAPE



Blending real architecture with augmented reality

It was in June 2014 that we welcomed the first official visitors to our SWARCO TRAFFIC WORLD (STW)", remembers Richard Neumann, Communications & Events Manager with SWARCOAG, the guests from the Parking sector in Norway. Since then some 1,500 preregistered visitors per year have been introduced to the know-how, products and solutions of SWARCO. However, in the course of seven years, a lot of progress has been made in these fields. That is why we started an upgrade project in autumn 2020. The results of this project can now be experienced in Wattens. Visitors are welcome again prior appointment.

"In a cross-company approach we decided about the removal of outdated exhibits and the installation of latest hard- and software", explains Thomas Fluckinger,





The Intelligent Transport Systems part of the SWARCO TRAFFIC WORLD

leader of the upgrade project. "For the installations we were able to count on the excellent services of our own technicians and external standbuilding partners. But as usual, a larger part of the work was dedicated to the most suitable concept of how to present things", says Fluckinger. The STW continues to be a mix of an open space for discussion, networking and permanent exhibition, illustrating SWARCO's leading idea of improving quality of life with safer, more convenient and environmentally friendly solutions. Visitors will be introduced to the latest

generation of smart traffic signals called COMBIA and to up-to-date LED variable message signs, including the novel CUBILED. A large poster conveys SWARCO's innovation and technology roadmap and its embedment in market and technology trends. "A new feature is the so-called 'feedback wall' where our visitors are invited to give their opinion on specific questions and trends", says project owner Richard Neumann. The highlight of the showroom is a newly created Augmented Reality (AR) that converts the static room into animated

traffic scenarios. "Like this we are able to explain to our visitors in a very vivid and colourful manner complex contexts, software like our new urban mobility management suite SWARCO MyCity, and infrastructure-to-vehicle communication". The AR can be followed via the large videowall in the center of the STW. "Although the project took a little longer than originally planned, it was worth the efforts, because the result is really appealing. In addition, we finished the project considerably below budget", concludes Fluckinger proudly. ◀



Asking for the visitors' opinions: the Feedback Wall

# TAMING SOME OF AMERICA'S MOST COMPLEX INTERSECTIONS

WHEN IT COMES TO ADVANCED TRAFFIC CONTROL CABINETS (ATCC), IF A MANUFACTURER IS TO LEAD, THEY NEED TO DESIGN, PRODUCE, AND INSTALL CABINETS THAT ARE SAFE, MODULAR, AND ENERGY-EFFICIENT.

**S**WARCO's Californian subsidiary McCain offers more than 300 versatile and dependable industry and agency standard cabinets. In this edition of DRIVE ON we meet our colleague Reza Roozitalab, P.E., VP of Hardware Engineering, to direct attention to a cabinet range that meets the unique specifications of a widely diverse customer base, and the ways in which we bring order to some of America's most unruly intersections. Imagine if you will some of the most complex intersections in the United States. Let's look at three examples.

## SEVEN CORNERS – The 7 Corners Business District intersections in Virginia:

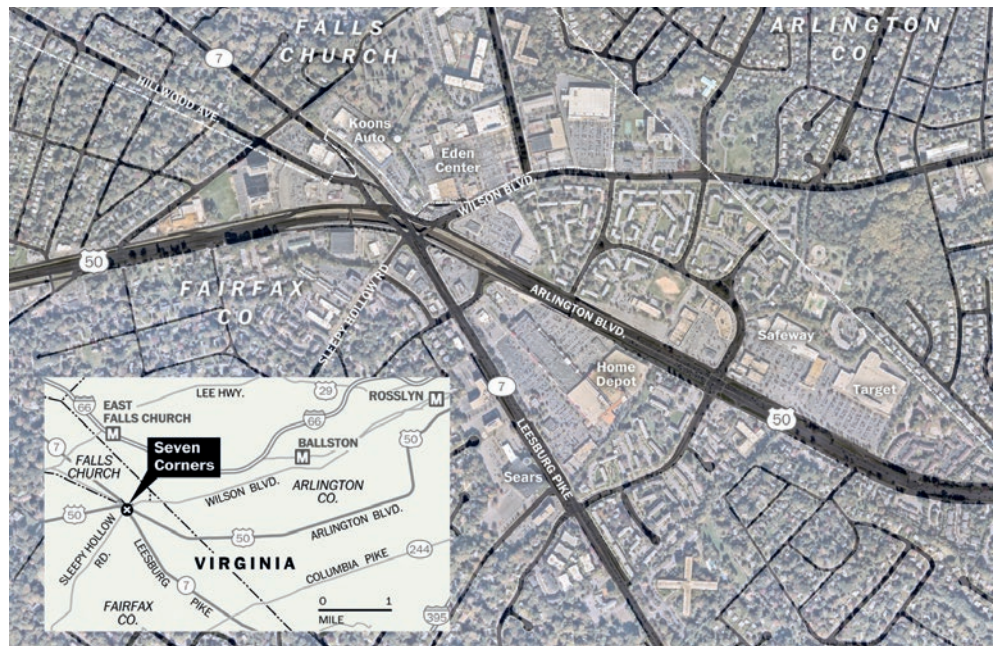
### The Challenge:

The 7 Corners Business District is a complex configuration with multiple traffic and pedestrian movements, the challenge was to keep both moving in the safest manner possible.

### The Solution:

The McCain 352ATC Cabinet was chosen by the agency and their consultant as it was ideal in permitting the addition of more pedestrian movements and

indicators at the intersection that their previous cabinet which had limited output channels could not handle. The McCain ATC Cabinet architecture was uniquely suited to add pedestrian movements



Arlington 7 Corners





MyFigueroa Los Angeles Traffic Control



Thumbs up for new ATC in L.A.

and indicators resulting in a substantial enhancement in safety.

**THE CITY OF ANGELS STRETCHES ITS WINGS – MyFigueroa: A Better Street for All Modes of Traffic in Los Angeles:**

**The Challenge:**

MyFigueroa transformed one of Los Angeles' most iconic and primary arteries for transportation and commerce. The desire of the City of Los Angeles was to transform the Figueroa Corridor between 7th Street and Martin Luther King Boulevard into a 'complete street' that would better serve the needs of pedestrians, bicyclists, transit riders and drivers. The existing cabinet was not capable of handling the additional bike lanes and other demands.

**The Solution:**

The McCain ATC Cabinet solution enabled the city to add bike lanes, bike rental access, metro line buses, subway, cars, and trucks, as well as pedestrians to share the streetscape safely, while improving access and movement.

**A TEXAS SIZED PROBLEM – (SW Loop 820 / Crowley Rd. / James Avenue) Forth Worth, Texas:**

**The Challenge:**

This unique set of intersections is one not repeated anywhere else in the United States. Consisting of four intersections in the City of Fort Worth, the ATCC installation required several independent 332 cabinets. The ATCC would need to be placed in an existing service shack under the overpass, which enabled the agency to mount a display in the safety of the shack to help them understand the operation.

**The Solution:**

The McCain ATC Cabinet had to have two racks; one for outputs (signals) and one for inputs (detectors and sensors). We placed the cabinet in the underpass shack, old equipment had to be removed before being replaced. The result has been a significant increase in both movement and safety with multiple intersection operation brought into one controller and cabinet, thus simplifying coordination and operation.

When Reza Roozitalab, who, by the way, received the Manfred Swarovski Award for outstanding performance in 2019, is asked what he would consider to be the ultimate intersection not yet under McCain ATCC, he says without hesitation that this would be the Dupont Circle intersection in Washington DC.

By continuing to focus on innovation and the core values of safety, modularity, and energy efficiency, McCain ATCC will remain at the forefront of solutions. ◀



reza.roozitalab@mccain-inc.com



# ROAD MARKINGS DOWN UNDER

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SINCE THE MIDDLE OF THIS YEAR, SWARCO HAS ITS FIRST OWN BASE IN AUSTRALIA, NAMELY ON THE OUTSKIRTS OF WESTERN AUSTRALIAN METROPOLIS PERTH. DRIVE ON (DO) SPOKE WITH **JONATHAN VYSE (JV)**, MANAGING DIRECTOR OF SUPALUX, TO FIND OUT MORE ABOUT THE NEW SWARCO FAMILY MEMBER.

**DO: Jonathan, can you tell us in a nutshell what Supalux is?**

JV: Supalux is a vertically integrated road marking group, specialising in the manufacture, supply and application of high-performance road marking systems in Australia.

We are in the unique position of being both the road marking manufacturer and the application contractor, the only integrated road marking group like this in Australia. It is the knowledge of material technology, how these various marking products perform and their capabilities, coupled

with our application techniques, that is the secret of our success down under. Our teams routinely paint over 30,000 kilometres of line markings each year. To put this into perspective, this is equivalent to painting a continuous line from Vienna to Vladivostok 3 times per year.

**DO: Who started Supalux – and when?**

JV: Supalux started in 1974 as a small paint factory that manufactured and sold decorative paint to house painters. My father, John Vyse, who has always been in the paint industry, bought the business as

a going concern in 1989 when he realised that the factory had the essential elements that he could build upon, with a view to focusing on Industrial and Heavy Duty paint supply in Western Australia.

One could say he fell into the road marking business, quite by chance. He was contacted by the Roads Authority in Western Australia with a general enquiry for any paint manufacturer that could supply a one-off quantity (40,000 litres) of alkyd resin based traffic marking paint. There was a national unavailability of the resin used by their Contract supplier and all road marking in Western Australia had



stopped because of this. There was an urgent need, and with lateral thinking and ingenuity, Supalux submitted a sample within a few days and received the full order.

There was a lesson here that larger companies often only think in one direction. However, lateral thinking and remaining flexible and nimble can be very valuable. Indeed, a lesson we must always remember.

Receiving this phone call was the start of our journey in the road marking business. Let's just say, he appreciated the large volumes and favourable payment terms provided by these new government customers.

Road markings were always applied by the various State Governments in Australia. However, as the privatisation of applying road markings unfolded in Australia during the 1990's, he saw an opportunity to diversify into becoming a contractor who could not only apply the markings, but manufacture them as well. It was a way of controlling the volume sales of our products and ensuring we were paid as well.

I joined the company 22 years ago to work alongside my father and have worked with him closely, learning the business and growing the company into a focused market leader, and well respected road marking specialist in Australia.

### **DO: What is your products and services portfolio?**

JV: Supalux manufacture and supply a comprehensive range of Waterbased, Cold Plastic and Thermoplastic road marking products, along with high-performance premix and surface applied glass beads. We also have ISO accredited laboratory facilities to test all products supplied by our group. We supply these materials to the Australian road marking

industry, along with using these materials in our contracting operations to deliver high-performance road marking systems to our government customers. These systems include longitudinal lines and transverse road markings, providing both dry and wet nighttime retroreflectivity for safer roadways in Australia.

### **DO: What are the peculiarities of marking roads on the Australian continent?**

JV: The large distances in Australia are a real challenge. To give you an example, it is not uncommon for our crews to travel up to 6 days just to arrive at their worksite to begin work, and the longest highway we maintain is over 3,000 kilometres in length. These distances mean we must have very rugged and capable equipment in our road marking fleet, along with very dedicated employees. Once we mobilise our crews to regional areas of Australia, we may not see them again face-to-face for many months because the distances to return home are too great. This requires very strong relationships between our management and crews to maintain a cohesive team environment within the company.

However, let it be said, being accustomed to long distance relationships will surely complement our strong relationships with our new colleagues in SWARCO worldwide ;-).

### **DO: What are your objectives in cooperation with SWARCO for road safety in Australia?**

JV: Improving the strength and capability of our organisation has been my major focus for many years.

This focus has led us to work to improve all aspects including material technology, a more comprehensive suite of road

marking materials, improvements to our plant and equipment, and most importantly a focus in upskilling our people.

Our strong cooperation with SWARCO is an important step toward further strengthening our organisational capability. Supalux is proud of being the most capable provider of road marking in Australia. Our strong cooperation with SWARCO, a world leader in this sector, brings Supalux onto the world stage.

I am confident that our customers will see our cooperation as very beneficial for road safety. Australian government road authorities are continually looking for world-class road marking innovations. With SWARCO, we can further work to exceed their expectations.

### **DO: Jonathan, what do you do when you are not marking roads, but have spare-time?**

JV: Apart from living and breathing road markings, I do find some time to enjoy a few other important things in life.

I am a husband to a wonderful wife and a father to three young men, who are growing up very fast. One of which will be starting to drive very soon, so you could say road safety has become an even greater topic of discussion in our household recently. I enjoy travelling overseas, however lately this has become difficult due to the pandemic. So we have spent some time travelling within Australia on long roadtrips with our family. We have a truly beautiful country with lots of special experiences to offer.

It also may not surprise you that as an Australian I also enjoy boating and swimming at some of our beautiful beaches. ◀

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IN JULY 2020, GÜNTER KITZMÜLLER JOINED SWARCO AS THE NEW CHIEF FINANCIAL OFFICER (CFO). A LOT HAS HAPPENED SINCE THEN. DRIVE ON (DO) WAS CURIOUS TO HEAR ABOUT HIS EXPERIENCES IN HIS FIRST YEAR AT THE AUSTRIAN TRAFFIC TECHNOLOGY GROUP.



SWARCO's Chief Financial Officer, Günter Kitzmüller

# NOT JUST ANOTHER YEAR

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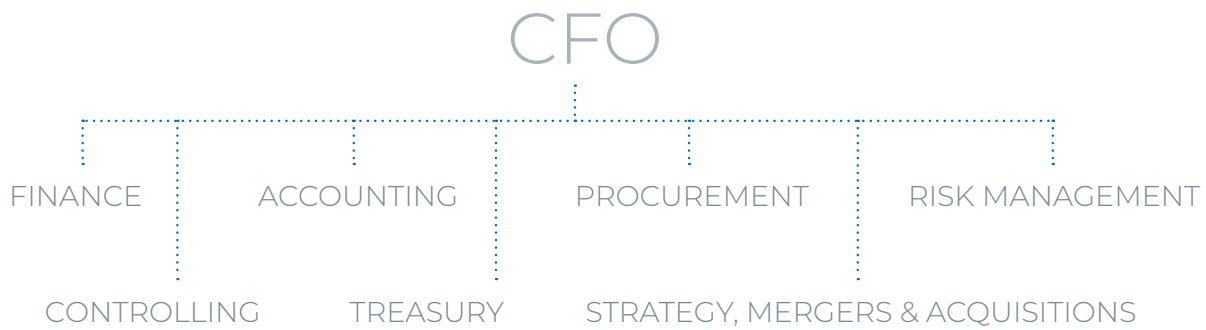
**DO: Mr. Kitzmüller, what were stations of your career before you came to SWARCO?**

GKi: In 1986, I started as a project manager for business software development and implementation. In 1991, I moved on to Trench Group, specialising in power engineering, design and manufacturing of high voltage electrical products. There I started as an IT manager in Austria before becoming Finance director and later CFO of Trench Europe. In 2008, I moved on as Managing Director to well known ski manufacturer Fischer Sports

Group, responsible for Finance, Treasury, Procurement and HR. Basically this was mainly a restructuring job with some really stressful times, but eventually the job was successfully completed.

In 2013, I joined the well-known fire fighting vehicles producer Rosenbauer, a publicly listed company within the ATX, as member of the executive board and CFO. It was a wonderful experience for me, being responsible for accounting, controlling, treasury, legal & compliance, mergers & acquisitions and investor relations.





The last two years before joining SWARCO I worked as managing director with sideloader manufacturer Bulmor Group, concentrating on the main tasks of reorganization and market entry in the USA.

**DO: What is the portfolio you represent in SWARCO as CFO?**

GKi: As a member of the SWARCO AG Executive Board, my role as CFO concerns the fields of finance with group accounting, group controlling, and treasury. I am also responsible for global procurement, risk management, strategy and mergers & acquisitions. Especially in the M&A sector, we have been very active despite the COVID-19 situation. An example of this is our new Australian base SUPALUX (see article on page 18).

**DO: When you look back on the past 12 months, what do you remember as particularly striking?**

GKi: Starting a new job during the COVID-19 pandemic was a really new and challenging situation for me. There were only a few personal visits to SWARCO sites possible. My introduction to all the colleagues in our ITS and RMS

divisions was mainly done in a virtual way with a lot of digital conferences. Imagine you have to manage an acquisition at the other end of the world without being able to personally meet your new colleagues. A really striking experience. Of course, I am glad that SWARCO's excellent fiscal year 2020 was a great facilitator of my start in the Group. It is good to know that we have motivated and loyal employees around the globe. Coming from other types of industries, I had to figure out first what glass beads are, how they are produced and what important role they play in road safety. Equally fascinating is what SWARCO has to offer in the domain of intelligent traffic management in terms of hard- and software.

**DO: Covid-19 has made us talk a lot about health. What is the current health status of SWARCO?**

GKi: Our solid equity position paired with excellent financial ratings means a decent profitability for our Group. Further growth, organically and via acquisitions, will encourage SWARCO and myself to push our current profitable net sales volume of more than 750 MEUR to the next level.

**DO: If you compare SWARCO to your former employments, what is different?**

GKi: I am particularly pleased with the professional, close, and excellent cooperation within the Executive Board. Every day I see that loyal and motivated people are ready to go the extra-mile, not only for their personal success, but also for the overall success of the entire SWARCO Group. You can feel the family spirit.

**DO: What do you do in your spare-time? Any hobbies?**

GKi: My spare-time belongs to my family. In the beautiful surrounding of the Tyrol I enjoy riding one of my mountain bikes. Should there be any time left, which is not often the case, I like to look into the topic of photography.

**DO: Thanks a lot, Mr. Kitzmüller, for your kind availability for this interview.**



# SWARCO INNOVATION HUB

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WITH PASSION AND IDEATION TO MARKET SUCCESS.

The complexity of modern mobility management and industrial developments as well as the advent of new global players offering digital services ignoring legacy infrastructure cannot be handled by an individual company alone anymore. That is why SWARCO fosters within its novel Innovation Hub the dialogue with various

stakeholders to be able to offer novel solutions that really meet individual needs. The SWARCO INNOVATION HUB is a novel initiative to foster the ties between corporations, cities, industry associations, academia and research institutions in shaping together future mobility. Our aim is to create an eco-system based on learning and interaction among stakeholders that will enable us to address in the best possible way the needs of the user and community.

“We are entering an era of exciting changes where global trends like urbanization, digitalization, automation, sustainability, along with the technological evolutions, are creating challenging opportunities“, says SWARCO Innovation Manager Laura Coconeá. “In this dynamic world, the future can only be created collaboratively with a lot of passion and ideation. We are therefore connecting all players of our business ecosystem

within our SWARCO Innovation Hub.“ Globalization, faster development cycles and the increasing number of product features are a motivation to involve more partners in product and process development. Therefore, collaborative product development has become routine in companies. The growing complexity of products and their development also lead companies to increasingly rely on cooperation and knowledge transfer in order to meet rising expectations which they can no longer fulfil on their own.

“We are in the process of sharpening our profile as thought leader and innovator in collaboration with our stakeholders“, explains Coconeá. “We therefore have created a hub aiming to facilitate the interaction between us as a company, our customers, start-ups, partner organisations and the academic world. Within this hub we are working along 5 dedicated initiatives.“



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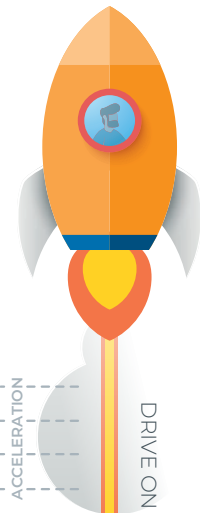






## BENEFITS

- LEARN
- DISCUSS
- TRY
- CO-CREATE



ACCELERATION

### LIGHTHOUSE PROGRAM

(see more on page 24) Our Lighthouse Program offers you a unique, free-of-charge opportunity to strengthen your bonding with SWARCO. A great opportunity to learn, discuss, try new things and co-create future mobility solutions.



### ADVANCED INDUSTRY SYSTEMS – JOIN & GROW

The JOIN&GROW program offers clients and partners a platform for joint product and process development for new industrial applications in the relevant target markets. We are open to innovation in the business sectors of SWARCO Advanced Industry Systems related to micro glass beads used as reinforcement materials for plastics and 3D printing, as filler materials for building materials, adhesives and paints, or as blasting media for surface treatments.



### RMS CENTER OF COMPETENCE

The Center of Competence is a globally connected department of SWARCO Road Marking Systems, bringing together all Research & Development departments and spearheading close cross-cutting cooperation between Sales, Production and striping companies. Within this worldwide network, experts specializing in different areas contribute their know-how and work together to leverage trends and further develop SWARCO Road Marking Systems' innovations.



### SWARCO INNOVATION TALKS

The quarterly Innovation Talks are live-streams with expert panels on specific future oriented topics. The format takes between 30 and 60 minutes and gathers opinion leaders from academia, industry associations, cities and SWARCO. Should you be interested in being part of such a talk, feel free to get in touch with us.



Please follow our website with its specific landing page on the Innovation Hub to remain posted about the latest developments in SWARCO Innovation and the part you as an industry stakeholder can play in it.

[innovation.hub@swarco.com](mailto:innovation.hub@swarco.com)



# LIGHTHOUSE PROGRAM – AN INITIATIVE WITHIN THE SWARCO INNOVATION HUB

“Existing solutions usually do not perfectly fit my actual needs.”

“It is hard to keep up-to-date with the technology evolution.”

“We often lack the resources (time, travel budget, capacities, know-how) to remain well informed about innovations.”

“We have almost no budget for trial-and-error experiments.”

If you recognize yourself in such statements, then you should become part of our Lighthouse Program.

**What's in for YOU as a part of our Lighthouse Program?**

Our Lighthouse Program offers you a unique, free-of-charge opportunity to strengthen your bonding with SWARCO. You will have a headstart in innovative developments in our group. You will benefit from exposure in the innovation community, network with other stakeholders, be an early tester of practical prototypes and can become a co-creator of innovative solutions that really fit your needs in shaping modern mobility. ◀



**DON'T HESITATE TO CONTACT US NOW:**  
[innovation.hub@swarco.com](mailto:innovation.hub@swarco.com)



## LEARN

Enjoy our information sessions on future mobility and technology evolution



## DISCUSS

Be part of our panel discussions on trends and hot topics with experts from associations, industry and academia



## TRY

Touch by hand innovative solutions supported by our experts in dedicated campaigns



## CO-CREATE

Become a co-creator in the design of future mobility solutions tackling daily pain points



# GLASS BEADS AS FILTER MEDIUM? CORRECT.

FOR CENTURIES, SAND AND GRAVEL FILTER MEDIA HAVE BEEN USED TO COLLECT, EXTRACT, PURIFY AND TREAT DRINKING AND PROCESS WATER. FILTER GLASS IS CONSTANTLY GAINING POPULARITY AS AN ALTERNATIVE.

**A**s a specialist in the production of micro glass beads, SWARCO also makes filter glass for water filter applications in customized OEM versions for pool system and filter manufacturers and resellers. SWARCOCLEAR filter glass beads have a highly effective filtering effect and offer clear advantages compared with conventional filter materials. “SWARCOCLEAR filter beads are a sustainable and environmentally friendly filter medium offering a reduced consumption of water, chemicals, and energy”, explains Robert Buchinger, Business Development Manager of our Advanced Industry Systems branch.

Thanks to their round geometric shape and the resulting homogeneous filter bed, filter glass beads have outstanding filtration

properties. Modern water well construction has already been using glass beads as a borehole support material in drinking water extraction for a long time. However, in addition to drinking water wells, glass beads also make a compelling case in filtration systems for water treatment and recovery. Many installations in private and public swimming pools as well as large industrial plants have proven this extensively.

### Well Rounded

The advantages of glass beads compared with sand as a filter medium are crystal clear. “Glass filters even the smallest particles out of the water thanks to its high bulk density, just like sand”, states Buchinger. “But glass beads do not stick and clump together or form channels, and they are easy to clean mechanically by backwashing the filter. This enables a more economical use of maintenance products.” Furthermore, due to glass having a more open structure, pumping power can also be significantly reduced. The amount of filter medium used can thus be reduced by up to 25%. At the same time, the much shorter backwash duration cuts water and energy needs drastically.

### Efficiency, Quality, Sustainability

SWARCOCLEAR filter beads improve water quality. The filter glass beads have a



smooth, closed surface as well as high material hardness and surface quality. As a result, germs and contaminants do not permanently cling to the filter glass beads. Up to 95 percent of all particles up to 1 µm in diameter are filtered out of the water. SWARCOCLEAR filter beads are made solely from high-grade recycled glass from the flat glass industry. State-of-the-art technologies employed in production reduce energy consumption and emissions and achieve better recycling rates in the raw materials used. ◀

For further information visit:  
[www.swarco.com/ais](http://www.swarco.com/ais)



[robert.buchinger@swarco.com](mailto:robert.buchinger@swarco.com)



# PAVING THE WAY TO THE SMART CITY WITH PARCO

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DIGITALISATION DOES NOT STOP AT THE URBAN PARKING SPACE. ON THE WAY TO THE SMART CITY, HOLISTIC, DIGITAL TRAFFIC AND PARKING MANAGEMENT IS A CENTRAL STRATEGIC COMPONENT. PARKING APPS PLAY AN IMPORTANT ROLE IN THIS. AT THE SAME TIME, THEY CAN ALSO SOLVE PROBLEMS SUCH AS AIR POLLUTION OR OVERCROWDED STREETS.

In the course of advancing digitalisation, road users are increasingly using parking apps to park in cities. By implementing such apps, cities are preparing for their future as smart cities and positioning themselves as modern and innovative places to live. The apps are not simply an additional offer for paying for parking: They create the basis for sustainably improved traffic and parking

use, reduced search traffic and improved traffic flow and are thus an important part of modern urban traffic and parking management.

One example of such an app is PARCO, SWARCO's parking app. With PARCO, users can find available parking spaces near their destination. The app displays information such as parking fees,





occupancy status of the parking space or maximum parking time. Users select a parking option and are navigated to it via their smartphone or via Apple Car Play or Android Auto. Once they arrive at the parking space, PARCO allows them to pay for the parking process cashlessly and to the minute via the app. Depending on the city, the digital billing of the parking spaces is based on transactions or licences. Parking control continues to take place via mobile end devices of the public order office, which are connected to PARCO via an interface.

Based on the PARCO parking app, SWARCO offers modular solutions for the digitalisation of traffic and parking control systems. The solutions are flexibly adaptable for each city and its individual mobility goals.

Cities with existing parking guidance systems (PGS) can integrate their PGS data into the PARCO app via an interface so that the real-time occupancy status of the parking objects is also displayed in PARCO. In this way, people looking for a parking space receive comprehensive

parking information at an early stage, which can lead to a better distribution to the available parking spaces. PARCO can also be integrated into existing city apps, configured city-specifically and display multi-modal mobility offers so that road users can quickly and conveniently access suitable (connection) offers such as e-scooters, e-bikes, car sharing, public transport or private cars.

With the city dashboard, parking zones, parking tariffs and other information can be managed clearly and easily on one platform. At the same time, the dashboard is also an analysis and planning tool for parking management and has various interfaces for integrating static and dynamic external traffic and parking data as well as other mobile applications, for example for connecting the city traffic computer.

The PARCO app can also be used as an extended mobile variable message sign. In cities with existing PGS, the app thus serves to display push messages when certain traffic- and environment-sensitive events occur, which are issued by an

event-based scenario manager (e.g. for major events). These can positively influence the routes and destinations of road users. In cities that have no PGS, PARCO can be used as a virtual PGS - without any hardware at all. The parking app serves here as a "PGS on the go", i.e. as a PGS for your pocket. The combination of cloud-based software with PARCO represents an uncomplicated, cost-effective entry into holistic traffic and parking management, especially for small or medium-sized cities. ◀



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# CIFLOW FOR STOCKHOLM

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TRAFFIC LIGHTS BEING NO LONGER UP TO DATE AND CREATING TRAFFIC DELAYS AT INTERSECTIONS MADE THE SWEDISH CAPITAL TURN TO SWARCO FOR A COMPREHENSIVE UPDATE. THE ONGOING PROJECT STARTED IN SPRING 2020 AND AIMS TO KEEP TRAFFIC FLOWS SMOOTH IN THE CITY WITH ITS ALMOST ONE MILLION INHABITANTS.

The project involves the updating of over 11,000 signal heads at 550 intersections over a three-year period, with the initial planning started in 2019 and the final inspections set for the end of 2022. SWARCO was tasked with the entire process of dismantling the existing signals, taking care of waste and installing the new traffic lights.

COMBIA CIFLOW was selected as best option, so an order was placed at SWARCO's factory in Austria to deliver the traffic signals. Stockholm is a modern and expanding city that strives to find smart and innovative solutions to its challenges. The COMBIA CIFLOW is a traffic signal ready for the age of smart mobility with a wide array of individual smart functions and a look and feel that perfectly fits into any cityscape. Some of the traffic signals were equipped with FUTURLED 6 – 230V, while others used FUTURLED 6 – 42V LEDs.

Stockholm, like many other cities, has implemented strategies to prioritise cycling as a means to help reduce some of the traffic on the roads. To further support this strategy, the installations of ALUSTAR Minis for cycle paths were included in the project.

At the start of summer 2020, the first set of CIFLOW traffic signals were installed with the goal of having around 5,000 additional traffic signals up and running by the end of the year, and at least as many during 2021. The plan was to start by focusing on the external areas surrounding the city and then move on to work in the city centre. A project of this magnitude always requires many service technicians and supporting personnel to meet the deadline, and at the peak level of the project almost 50% of all service technicians from the Stockholm office were involved in the installations, as well as several subcontractors. Project manager Roger Löfgren had close contact

and regular meetings with the City of Stockholm during the entire process to make sure that everything was in accordance with the plan. Of course, the COVID-19 pandemic affected the project in many ways, but the high number of people working from home led to a major decrease (almost 50%) in the number of cars on the roads, which facilitated some of our installation works.

“It has been a challenging project in which we had to carry out our work in a way to disturb the traffic in the city as little as possible. Stockholm is an active city with a lot of people in motion as motorists, cyclists, and pedestrians. Making sure not to disturb the daily journeys of the people living in Stockholm has been a challenge by itself. We thank the City of Stockholm for entrusting us with a project like this”, concludes Roger Löfgren, project manager with SWARCO Sverige. ◀



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SWARCO UK IS SET TO MAKE MAJOR IMPROVEMENTS TO ZERO EMISSION MOBILITY IN SCOTLAND.

# LEADING THE CHARGE

**S**WARCO UK has now taken over the operation of Scotland's public electric vehicle (EV) charging network – ChargePlace Scotland – a contract which was awarded by Transport Scotland earlier this year. The migration, which was initiated at the end of July 2021, is believed to be the largest charge point migration ever undertaken anywhere in the world.

Scotland's public EV charging network was established some 10 years ago and with continued investment from the Scottish Government it has grown from 55 charge points to over 1,800. The public network puts Scotland way ahead of every other region in the UK, with the exception of London, in the provision of public charge points. As one of the very first infrastructure providers to be operating in Scotland, SWARCO is proud to have played an instrumental role in its development from the very beginning. Its charging technology has now become the watchword for reliability and performance and its approach to smart charging is at the heart of its ambition to build a truly world-class network.

As the new network operator, SWARCO has set up a new operations team and

service centre at Scotland's hub for net-zero innovation – the Michelin Scotland Innovation Parc (MSIP) in Dundee.

The team's first priority for the migration was to achieve network stability and work with all of the third-party charge point manufacturers, who have infrastructure on the network, to ensure their equipment is reaching the necessary performance standards. Martin Symes, SWARCO's Framework Director for ChargePlace Scotland, is pleased to see the team manage a successful migration: "We have successfully completed the first step, and we are on our way to improving the network and delivering the very best for the people of Scotland. We will be working hard to support the EV driver community, as well as all the hosts and owners of the charge points, over the coming months and years to support the current network demands while also developing solutions for rapid growth as more people move to driving electric vehicles."

In order to make significant improvements to the operability and reliability of the network, SWARCO has migrated the ChargePlace Scotland charge points onto its own network platform – e.Connect. This means that for the first time, the operator

will be able to monitor the health of every charge point on the network, every minute of every day. It also has an automatic fault detection capability to spot when a charge point is down or at risk of failing – dramatically improving the robustness of the network. The new ChargePlace Scotland App will give drivers access to transaction data and account information which they have never had before.

Justin Meyer, Managing Director of SWARCO Smart Charging adds: "We've been closely engaged with Scotland's EV driving community for more than a decade, and are proud of being trusted with helping to deliver and manage a national network that drivers can depend on." ◀



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# READABLE ROADS FOR AUTOMATED DRIVING

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CAV, V2X, C-ITS, CCAM – THE ACRONYMS ARE DIFFERING, BUT THEY ALL HAVE IN COMMON THAT THEY DENOMINATE THE LINKING OF ROAD INFRASTRUCTURE AND VEHICLES WITH THE AIM TO IMPROVE TRAFFIC FLOW, REDUCE EMISSIONS AND MAKE TRAFFIC SAFER AND OUR JOURNEYS MORE CONVENIENT. DRIVE ON (DO) SPOKE WITH **HARALD MOSBÖCK (HM)**, SWARCO'S VICE PRESIDENT ROAD MARKING SYSTEMS FOR EUROPE AND APMEA, TO LOOK INTO THE ROLE OF ROAD MARKINGS FOR HUMAN AND MACHINE VISION.

## **DO: Harald, are our roads ready for the advent of self-driving cars?**

HM: Our roads today are not really ready. You have to consider that lane markings are currently read by two kinds of sensors: camera and Lidar. Even the most advanced vehicles equipped with high-definition maps need that kind of sensors in order to capture the lane markings and traffic signs and to determine whether all the data is really comparable and fitting together. The point is that road markings and traffic signs still lack uniformity on global roads, there is a lot of differences all over, and as long as lane markings and traffic signs are not fully standardized and harmonized to be identified 100% correctly, we will not be able to achieve a proper reliability of that kind of sensors.

## **DO: What demands and trends are emerging at international level to improve road markings?**

HM: Richard, it's a process mainly driven by the Japanese, the American and the European standardisation bodies, whereas in my opinion it's the

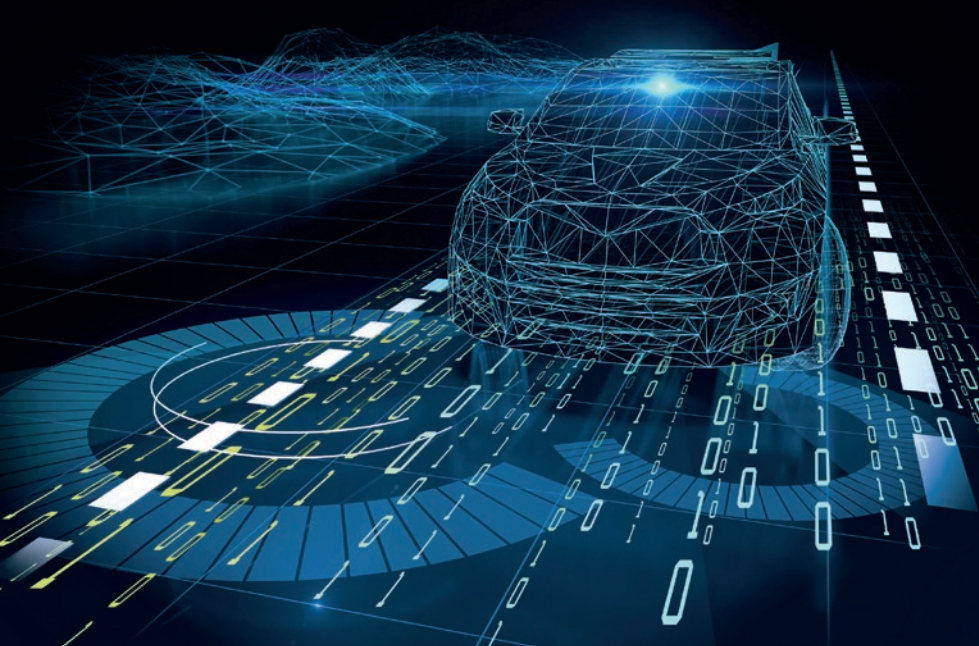
United States that are again a step ahead. The latest edition of the North American Manual on Uniform Traffic Control Devices (MUTCD) is to contain a requirement for major roads that normal lines be 150 mm (6 inches) wide and markings more uniform, which was one of the key deficiencies for CAV implementation. Just recently a major standardisation body proposed to the Federal Highway Administration that lane markings on the highway network in the future should not only have a standardized width, but there should be a general requirement for dotted lines at highway exits and a standardized gap width of interrupted lines. Right now, there is work in progress addressing the topic of better retro reflectivity, a very challenging subject. Another issue is how lane markings in roadwork zones can be improved in order to attain a reliable and consistent machine readability for automated or assisted driving.

## **DO: What are the predominant actions in Europe, pushed also by industry associations like the European Union Road Federation, in terms of improving road markings?**

HM: Amongst the recent developments setting the stage for the introduction of Connected and Automated Vehicles, the European Commission in the 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 European Council decided last year to revise the road safety management directive and charged the European Commission to form an expert group and work on how road markings and traffic signs should be done to be best readable for vehicles and, of course, for the humans as well. The expert group took up work, but due to the pandemic the entire process is delayed. We were hoping for first results already by the middle of 2021, but currently expect first outcomes only towards the end of 2021. In general we can say the communication between carmakers, industry associations and Brussels on the expectations for the quality of road markings has already greatly improved.



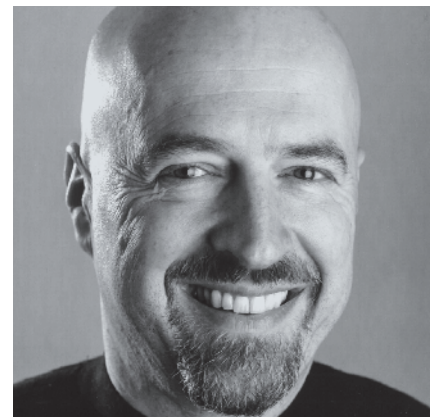


markings in roadwork zones should be orange in the future. The Lidar proved to not be affected by glare. So if you combine camera and Lidar in a car, you will end up with a really good readability and reliability for the assisted driving.

**WH: What about the financial aspect of road markings and your expectations for the near future?**

HM: That's the big question. Whenever you discuss about higher performance of lane markings with the automotive industry or road authorities, the first question is always: Who is going to pay for that? My belief is that all over Europe we need better performing lane markings on the road networks. Once we have achieved a level which is most suited for the human eye, then it will work for the automated vehicles as well.

This is still a long way to go, because due to the road authorities lacking sufficient fundings, I doubt that they will be able to finance high performance lane markings for all road networks. That is why I expect major progress in better road markings for human and machine vision first on the long-distance arteries of the Trans-European Networks. ◀



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**DO: What is the 150x150 formula recommended by the ERF?**

HM: This recommendation elaborated by the European Union Road Federation is very similar to the tendencies in the USA just mentioned. The formula was created taking into account only the human eye, with the goal to improve road safety. Interestingly, several studies proved that what is good for the human eye to support safe and comfortable driving also works very well for machine vision. The "150x150 formula" recommends a line width of 150 mm and a retroreflectivity (RL) > 150 mcd/m<sup>2</sup>/lx (under dry conditions; RL > 35 mcd/m<sup>2</sup>/lx under wet conditions).

**DO: SWARCO has carried out special tests on the recognizability of road markings for cameras and Lidar. Can you tell us about the results?**

HM: Indeed, we carried out tests in the very impressive world's biggest climate tunnel in Vienna with Austrian partner company ZKW, a leader in automotive lighting technology. It's not a secret that one day of testing in that climate tunnel costs 70,000 euros, so you can imagine that cooperation and sharing costs is important. We put eight different kinds of lane markings from

standard to high performance systems and made them read by three different kinds of cameras and eight different kinds of Lidar sensors. We simulated 24 different weather conditions such as perfect daylight to nighttime conditions, wind, stormy weather, heavy rain and foggy conditions.

I would like to start with some findings regarding the camera and mention the rule of thumb also expressed by Mobileye, the worldwide leader in in-vehicle camera technology: What a camera can read, is also readable by the human eye. What the human eye can read, must not necessarily be readable by a camera. Something we could fully confirm in our tests with ZKW. On the one hand, a strong point of the cameras is their identification of contrast. On the other hand, they show a weakness when they have to read when glare light is coming from vehicles on the oncoming lane. When we are talking about the Lidar sensors, some high retro-reflective road markings are absolutely increasing the readability and detectability by Lidar.

And, especially when we are going even to a near infrared range with some special pigmentation, the Lidar can read an orange road marking very accurately. This is important in the light of ongoing discussions in the USA whether lane

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