

DRIVE ON

THE CORPORATE MAGAZINE OF THE SWARCO GROUP

01/17

FROM CONVENTIONAL TRAFFIC MANAGEMENT TO VALUE-ADDED SERVICES

INTERVIEW WITH SWARCO'S COO'S

ROAD MARKINGS AND
AUTONOMOUS DRIVING

TRAFFIC MANAGEMENT FOR
CITIES AND PORTS





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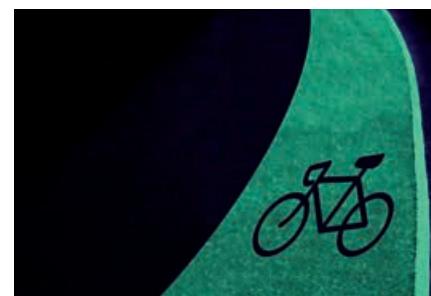
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IMPRESSUM: Content coordination & editing: SWARCO AG, Richard Neumann; Layout, graphic concept: pia GRAFIK & DESIGN, Pia-Luzia Frankowitsch, Schwaz; SWARCO AG, MM; Photos: SWARCO, Shutterstock, Harald David, Los Angeles, CA Stock Image; Print: RWF Werbeagentur, Volders, Austria; Circulation: 6,000 copies; © SWARCO 03/2017

VALUES INSTEAD OF WORDS. INTERESTING NUMBERS FROM THE WORLD OF SWARCO.

3500
mobility experts

Our 3500 employees worldwide follow one mission: As experts for road marking systems and intelligent traffic management solutions they support the customers to implement safe, convenient and environmentally sound mobility.

70
countries

5

decades

The first chapter of the SWARCO story was written in 1969 when Manfred Swarovski erected his first glass bead factory in Austria. Half a century later SWARCO is one of the world leaders in road markings and traffic management.

1001850
road kilometers

The annual production of SWARCO road marking systems is sufficient to equip more than 1 million road kilometers. This corresponds to some 25 journeys around the globe.

1200
millicandela

SWARCO road marking systems can be 6 times brighter than conventional stripings. The unique **SOLIDPLUS** high performance glass beads boost retroreflectivity values up to 1200 mcd/m²lx.

615.000.000

Fiscal year 2016 resulted in a new all-time high in revenues. SWARCO is growing positively – and our customers grow with us.

WORKING FOR SWARCO: JOBS WITH PROSPECTS IN THE DIGITAL AGE

TRAFFIC TECHNOLOGY IS UNDERGOING RAPID TRANSFORMATION IN THIS CHANGING DIGITAL AGE. THIS ALSO IMPACTS UPON THE WORKING ENVIRONMENT, JOB PROFILES AND COMPETENCIES IN THE GROUP. GÜNTHER KÖFLER AND SIGRID KAPFERER EXPLAIN HOW THE SWARCO ACADEMY IS PREPARING MANAGERIAL STAFF FOR THE CHALLENGES AHEAD.

The stability of a family business with its corporate culture and continuous advancements in a rapid and at times disruptive environment in the field of traffic technology create an exciting, international working climate. Therefore, motivated and skilled employees matter greatly to our success. It is one of the group's stated objectives to develop our staff through internal and external training courses and through CPD programs. "Our own SWARCO ACADEMY offers tailor-made training plans, consisting of specialized and personality-led training courses," explains Günther Köfler, Head of Legal Affairs & Human Resources at SWARCO AG. "Around 130 people took part in the various courses in 2016."

to offer: multi-stage sales training programs have recently been rolled out in the SWARCO regions of Scandinavia, UK and Italy. The expansion of sales competencies and the high quality of professional customer support that this produces will lead to increased sales successes and will ultimately boost the value of the company. Needless to say, the SWARCO ACADEMY is also pivotal to talent management and continuous succession planning. As a traffic technology corporation, SWARCO can offer numerous interesting careers focusing on technology, commerce, communication and administration. Pay a regular visit to www.swarco.com/en/career to have a look at what's available. You may find just what you're looking for! <

One focus is on the development of managerial personnel. A large number of operations managers completed national and international courses where they received training in, among other things, good management practice, management tools and inter-cultural skills. All these group-wide programs also serve to develop and reinforce a shared understanding of SWARCO's vision and strategy, as well as to further enhance networking and exchange between our managerial staff. "We launched the management staff program for experts for the first time in 2016 in response to the increased demands to promote expert careers and to enable our managers to develop their socio-communicative skills and to enter into dialog with customers and managers with greater self-assurance," adds Human Resources Manager Sigrid Kapferer. The SWARCO ACADEMY has even more



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TRAFFIC MANAGEMENT AS A SERVICE

"TRAFFIC MANAGEMENT AS A SERVICE" – TMAAS IS A NEW CONCEPT WHICH APPLIES THE LATEST I.T. IDEAS AND TECHNOLOGY TO TRAFFIC MANAGEMENT INFRASTRUCTURE, WITH A WIDE RANGE OF DIFFERENT APPLICATION MODULES MANAGED BY EXPERTS.

t is based on flexible deployment options tailored to individual customer requirements. Using browser based user interfaces with easy workflows, the solution is ideally suited to the modern work environment where access is often needed to traffic management away from the traditional control room. In the future the range of traffic modes will get more diverse: bicycles, pedestrians, Public Transport, and highly automated vehicles are going to play a major role and will need tailored information and traffic management approaches. "By 2020 nearly 20 billion IoT enabled devices will generate massive amounts of data which can be used to predict and react on traffic and mobility events", estimates Manuel Milli, Solution Manager Urban Traffic Management and Smart Mobility with SWARCO's Innovation Office. Traditional traffic detection and sensing technologies can

be complemented by data from vehicles and mobile devices. Highly automated and connected vehicles set new quality standards on infrastructure and its maintenance, paving the way for new traffic control schemes. SWARCO's TMaaS approach uses a combination of leading edge technologies which integrate with the operational infrastructure and are prepared to cope with these major social and technological trends.

Traffic management systems are essential tools, supporting city and road managers to efficiently operate their networks and manage ever changing traffic situations. The conventional approach required software and hardware installed at the customer premises and implies high levels of IT engagement and competence at the client side. All this translates into considerable procurements costs and initial investments. Moreover, most agencies use



only a subset of the available features, which means high training costs with limited return and the need for additional support contracts. Increasingly, only large agencies with large numbers of qualified staff can afford and fully benefit from the advantages of modern traffic management systems. SWARCO has developed this modern approach to overcome the above mentioned issues and builds directly on experience gained from existing customer deployments and feedback.

"TMaaS is offered as a cloud based infrastructure to provide a completely scalable solution, including full redundancy and standby options for complete peace of mind and continuous operation", explains Manuel Milli. "Furthermore, web technologies allow system monitoring to be easily implemented and shared with all stakeholders for maximum engagement. TMaaS is not only a valid and cost efficient alternative to conventional traffic management systems, but provides a number of additional key benefits."

TAILORED TO REAL NEEDS

Every city has its own individual requirements and these need different tools to be efficiently managed. Through TMaaS, customers will

have access to a number of different features and software modules and will be able to choose only those which are relevant for their specific requirements and for the time needed. The growth of the system in terms of installed equipment or features will not be a problem, TMaaS cloud infrastructure provides a completely scalable solution.

REDUCED TIME TO BENEFIT

The TMaaS approach reduces the overall costs and almost eliminates IT needs on the customer side while increasing security. The system will always be up-to-date, and upgrades are managed on a service basis. The system is able to support different providers and follows an open approach to external suppliers. It very much increases portability and offers a perfect solution for employees who are increasingly on the move: with anytime, anywhere availability.

PRO-ACTIVE MAINTENANCE

TMaaS fully supports equipment monitoring and system maintenance providing all the data to move from a reactive to a more proactive approach optimizing physical presence on site and spare part management.

ENABLING CONSULTANCY AND EXPERT SERVICES

This concept enables SWARCO to provide TMaaS to the customer who today does not operate a traffic control system or does not have the staff available for dynamic traffic management. If needed, SWARCO can also provide operational services such as the management and maintenance of breakdown equipment and operational incident management.



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TRAFFIC MANAGEMENT FOR THE CAPITAL OF URUGUAY

SWARCO TECHNOLOGY IMPROVES MOBILITY AND TRAVEL TIMES IN MONTEVIDEO, THE SOUTHERN-MOST CAPITAL CITY OF THE AMERICAS. QUALITY OF LIFE IS ONCE MORE THE WINNER.

In order to gain better control over the traffic in the 1.3 million-inhabitant metropolis, the city of Montevideo was in desperate need of a new traffic management center. After previous disappointing attempts to achieve this, the city prepared well for this endeavour and established a new department with the task to prepare a high standard for both products and performance. An experienced consultant was hired to provide support in the tender specifications and help the traffic department to prepare the project in line with the city's wishlist. "In view of the demanding specifications in terms of products, quality and performance, we felt it was an excellent opportunity for SWARCO

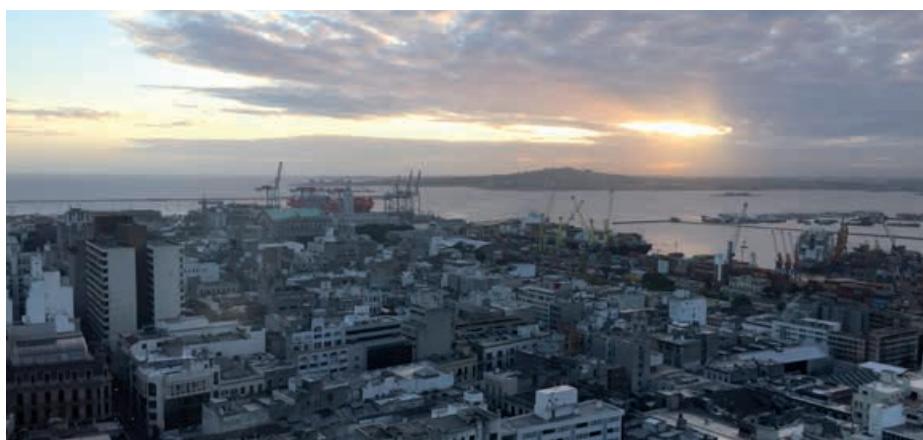
to prove its competence in traffic solutions and in making traffic flow better in a big city", reports Thomas Rønslund, Sales Manager with SWARCO's Danish subsidiary SWARCO TECHNOLOGY in Odense. "We therefore joined forces with the local construction and infrastructure service specialist CIEMSA, who took the lead in becoming qualified for the tender". The tender for Montevideo's new traffic management center was issued in spring 2015, with SWARCO and CIEMSA bidding in partnership. Although CIEMSA only had a few months of experience with SWARCO products and solutions, great efforts on both sides resulted in winning the tender and being awarded the project.



The project was completed within the given timeframe of 12 months, and already in an early phase of the implementation it became obvious that the required performance was met with improvements in mobility and traffic safety. This first phase included 133 intersections, equipped with SWARCO ITC-2 traffic controllers, modems, all centralized to an OMNIA traffic control center with fully adaptive UTOPIA functionality for traffic optimization. Four LED variable message signs by SWARCO FUTURIT were strategically positioned within the city to provide guidance and information to the motorists. The before/after study shows the hard evidence that the

SWARCO solution delivers real benefits which justify the investment. "A 12% reduction in travel time and a 20% reduction in waiting times at intersections are facts which speak for themselves", says Thomas Rønslund proudly, referring to the positive changes the drivers now experience in the beautifully situated city on the northeastern bank of the Río de la Plata. "It has been a great experience to work with such qualified and highly committed people, both in CIEMSA and in the city authorities. And it is very rewarding to see the improvements achieved for Montevideo, increasing further the quality of life in this fascinating city", concludes Rønslund.

*There are at least two explanations for the name Montevideo: The first states that it comes from the Portuguese "Monte vide eu" which means "I see a hill". The second is that the Spaniards recorded the location of a mountain in a map as "**Monte VI De Este a Oeste**" meaning "The sixth hill from east to west". The city's full original name is San Felipe y Santiago de Montevideo.*



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IMPROVING TRAFFIC FLOW IN MOSCOW

SWARCO'S OMNIA PLATFORM HAS BEEN IMPLEMENTED IN THE TRAFFIC CONTROL CENTER OF THE RUSSIAN CAPITAL. PRIORITY FOR PUBLIC TRANSPORT, IMPROVED PREDICTABILITY OF TRAFFIC SCENARIOS AND INCREASED TRUST IN I.T.S. TO MANAGE MOBILITY IN BIG CITIES ARE REAL BENEFITS FOR TRAFFIC OPERATORS AND TRAVELLERS ALIKE.

Moscow continues to implement the largest transport system development program among European cities, aiming at solving the problem of inconsistencies in the current road network capacity with the real high demand for transport services. Significant progress in this field has already been acknowledged by a prize from the International Transport Forum. In Leipzig in May 2016 the Moscow Transportation and Road Transport Infrastructure Development Department, represented by Mayor Sergey Sobyanin, was assigned the ITF Transport Award in the category "Special achievements in the field of transport".

SWARCO in cooperation with its long-standing Russian partner "Stroy Invest Project M" Company has been actively involved in this work. "In Moscow over 450 traffic lights are

controlled by the adaptive traffic control system UTOPIA. More than 1,300 intersections are equipped with SWARCO traffic controllers of local assembly", says Oleg Kudryavtsev from SWARCO Trade and Service.

An important component of Moscow's efforts to implement modern intelligent transportation systems (ITS) is the Traffic Control Center (TCC) where traffic flows are monitored and managed to make the road network of the large metropolis more efficient.

In May 2016, a pilot project started in Moscow with the strategic goal to improve the efficiency of the existing ITS systems and subsystems through closer integration. The objective was to set up at TCC level a single tool to monitor and control all road and transport sections of the pilot zone while providing full and relevant information to take operational decisions. Part of the project was

also the organization of priority for tram route No. 17 at traffic light intersections within the pilot area to improve the level of passenger service. SWARCO's OMNIA system was chosen to do the job. The list of tactical tasks included firstly merging adjacent areas of UTOPIA adaptive traffic control zones in the North-Eastern part of the city into a common network and secondly merging them with the motorway sections operated in the plan selection mode. OMNIA also had to ensure integration with the newly developed system "Comfort Entry", managing traffic flows on motorways at the entrances to the Moscow city. The task of granting priority to trams was resolved by providing interaction between the adaptive traffic control system UTOPIA and the external public transport management system.

Mikhail Bogoroditsky, Head of Traffic Light Department at Moscow TCC, knows the benefits of this pilot project: "Each individual system has become part of an integrated ITS. Traffic flows on sections of the road network are optimized, considering the traffic situation in adjacent areas under control of various systems, methods and strategies. Intersections became the junction points at

which redistribution of traffic flows is based on the control algorithms adopted in the operation of related systems. Gaps in control have disappeared, and the TCC is now able process complex scenarios."

From the point of view of operational control there is access to integrated systems from a single source – the OMNIA platform. This considerably increases the TCC's speed of response to the traffic situation, accelerates information research and facilitates the operator's performance by making it as efficient as possible. The analysis of tram priority statistics, for example, discovered the need for changes in the traffic organization at complex objects and at some intersections. Consequently, additional phases were implemented in the cycle. Thus, the waiting time for travellers significantly decreased. And it is not just about technical indicators; for the city residents, the predictability of travel times even during rush hours has improved. Moscow traffic authorities expect that the citizens' trust in ITS-based municipal services increases, no matter which type of transportation, private or public, they prefer.



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Oleg Kudryavtsev from SWARCO's Moscow operation expresses his thanks to all parties involved: "The pilot project is the result of efforts of many people, both in SWARCO and among our partners here in Moscow. We are pleased that our work is appreciated by a very demanding customer who knows that we have many things to offer. We look forward to jointly tackling the huge traffic challenges of Russia's largest city!"

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SMART PARKING IN OSLO

TODAY, AS MUCH AS 30% OF THE TRAFFIC CONGESTION IN OUR CITY CENTERS AND 20% OF OUR TIME IS DEDICATED JUST TO FINDING A PLACE TO PARK OUR CARS.

While we are doing this, we waste time, get stressed and cause noise and air pollution. But there are great solutions to prevent this, reports Odd Melgård, Parking Business Manager of SWARCO Nordic in Oslo.

Imagine how much easier life could be if you were able to get a guaranteed parking place by booking it before you leave from home. You would then be taken straight there by your chosen navigation system, giving you more time to do what you want. It should also be possible to take the hassle away from trying to remember what you did with the

parking ticket, or if you even have the right cash with you. Instead just park without a ticket and pay automatically for the parking time used when you leave. Validations or discount coupons could also be applied to reduce the parking charge. <



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"With parking solutions from SWARCO, this ideal is much closer than you think", says Odd Melgård. "It is a totally realistic scenario to become standard in the near future. We have all the technology that is needed for smart parking and there are already pilots up and running in the Norwegian capital Oslo."



WELL ORGANIZED TAXI QUEUES IN SWEDEN

AT GOTHENBURG LANDVETTER AIRPORT, WE HAVE TRANSFERRED THE TAXI AREA INTO A WELL ORGANIZED ONE. EVERYTHING PLANNED WITH A SYSTEM THAT PROVIDES A SECURE AND COMFORTABLE EXPERIENCE FOR DRIVERS AND CUSTOMERS. AND THE BEST OF ALL: ENVIRONMENTALLY FRIENDLY CARS GET AWARDED!

SWARCO has developed an add-on to its already popular parking software SwappAccess. Instead of the usual stop and go in queues, like taxis normally do, this add-on makes it possible to organize, queue and administer cars. In brief, this is how the system works:

Cars get registered at the entrance of the area, and then park and wait. When it is their turn to drive out to pick up their customer, the cars are called up by their taxi number. All this is handled automatically by the parking system. "So if you know about other areas that would need a smart queuing system, you might want to think of using the SwappAccess Taxi solution from SWARCO", suggests

Thony Rysjö from SWARCO SVERIGE.

"With this new taxi system, the most environmentally friendly taxis will be awarded with higher priority in the queuing system."



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FUTURLUX: FOR A BRIGHT FUTURE

THEY ARE CALLED AREDO, CITERA, POLIFINA, LUNIA, RIMANO, AND HEAD. SWARCO'S LED STREET LIGHTING PORTFOLIO BRANDED FUTURLUX HAS SUBSTANTIALLY GROWN AND ATTRACTS THE ATTENTION OF CITY PLANNERS AND ARCHITECTS ALIKE.

Many cities and communities in domestic and foreign markets have been convinced over the past years by highest energy efficiency, attractive design and favourable life cycle costs. The expansion of the existing luminaire program as well as new product variants are much appreciated by architects and city planners. CITERA, for instance, was not only complemented by a 76 mm top mounting adapter, but can now also be used for larger parks and parking areas thanks to the additional rotation-symmetric optic. Also the compact AREDO luminaire was optically and technically adapted to respond to any customer-specific requirements and use cases.

"In order to present our whole product portfolio to the customers in a catchy manner, we restructured our website in a way to describe each luminaire with detailed optical and technical features", says SWARCO FUTURIT

street lighting product manager Claus Ruprechter. Thanks to downloadable data sheets and light-files, a professional illumination planning for each



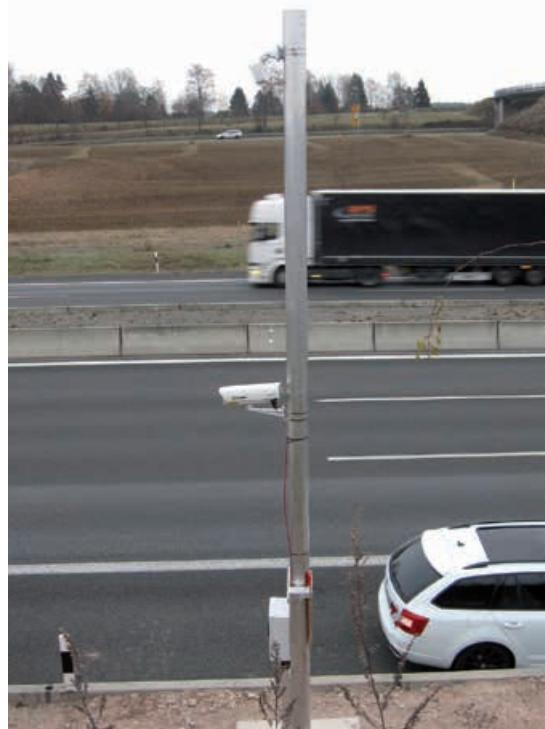
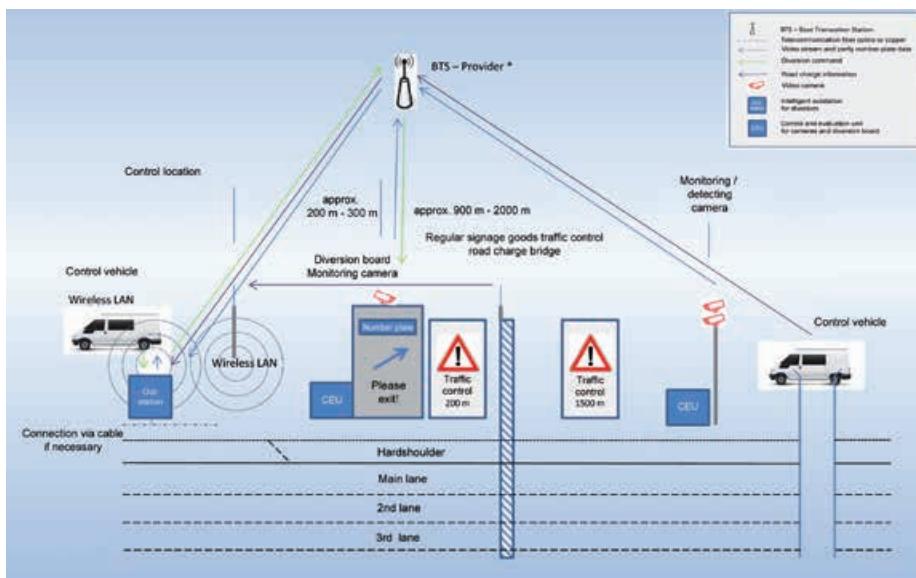
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individual use case has become possible. A new feature on the website is also that SWARCO FUTURIT offers its customers the DIALUX plugin as download. Light planners can use the DIALUX planning software to directly include all FUTURLUX luminaires in their calculations.

Of course we are focusing on constantly adjusting our products in line with new developments in the LED sector in order to remain at the cutting edge of luminaire technology also in the future. We are confident that numerous projects and tenders with FUTURLUX LED street lights configured in line with individual specifications will convince the decision-makers on a short-term basis. So the future is bright with FUTURLUX.

*More information on the entire
FUTURLUX product family
can be found under
www.swarcofuturit.com*





SAFER TRUCK CHECKS ON GERMAN MOTORWAYS

SWARCO MAKES LIFE EASIER AND SAFER FOR B.A.G. AUTHORITY.

The Federal Office for Goods Transport (BAG) is making an important contribution to traffic safety, environmental protection and tax collection by conducting road, tolling and operational inspections on German motorways and highways. In these inspections, individual trucks are prompted to leave the motorway by being flagged down manually by BAG employees on site to the parking lots used for this purpose. "This not only requires a high number of staff, but also represents a serious safety risk", states Jürgen Zimmer, Interurban Projects Manager with SWARCO TRAFFIC SYSTEMS. Automating the process can reduce personnel and, above all, ensure safer working conditions for those involved. In a pilot project, SWARCO has equipped 5 BAG checkpoints with specially developed

traffic technology to guide vehicles out safely and automatically.

At four locations ahead of the checkpoints, ALPR cameras capture the license plate and country code of vehicles as they drive by. A video camera shows the detected vehicles in their lane. The data is then transmitted to the intelligent outstation on the parking lot of the BAG checkpoints using wireless technology or fiber optic cables. This information is then forwarded by W-LAN to the BAG employee's laptop and displayed in the browser-based software. This software helps the BAG employee select the vehicles that will need to be diverted for inspection – in advance and at a safe distance. The corresponding license plate number will automatically be transmitted to the freely programmable, camera-supported LED sign, prompting the driver to exit to the checkpoint. Trucks, buses, and cars with trailers can also be instructed to exit as a group. The whole system does not require powerful servers, but simply runs on an industrial PC with a touch panel and

integrated browser and a standard communication & controller module. The central software runs completely "dockerized" as an up-to-date resource-saving container on the industrial PC.

The BAG pilot systems are being implemented in 5 lots, at one checkpoint each on the federal motorways A1 (Schleswig-Holstein), A2 (North Rhine-Westphalia), A3 (Hesse), A9 (Bavaria) and A10 (Brandenburg). 



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MANAGING HGV TRAFFIC AT THE PORT OF DOVER

BETTER SIGNAGE, INCREASED EFFICIENCY AND LESS CONGESTION ON THE ADJACENT ROAD NETWORK ARE IMPORTANT ASSETS FOR THE ENGLISH PORT AUTHORITY.

Ports are essential to the British economy. As an island nation, they always have been, and their importance is unlikely to change any time soon. They continue to provide crucial transport links to Europe and beyond, while the volume of freight that passes through them is, put simply, enormous. With ever-increasing freight volumes to handle, ports have a duty to invest in, maintain and develop infrastructure on an ongoing basis.

One of the recent changes that ports have been undergoing is the move towards digital technologies – for example, technologies able to assist in the better movement of vehicles and freight through a port's boundaries in an environmentally friendly manner.

Certainly, this has been a focus for Dover Port, where SWARCO TRAFFIC LTD. has delivered and installed VMS and technology in support of a new freight holding facility.

In 2015, the Dover Port witnessed record volumes of freight passing through (2.53 million units), an increase of five percent on 2014 – equating to £119 billion of trade annually (or 17 percent of the UK total). Such increasing traffic requires support, and to that effect the Port is currently undergoing an £85 million investment programme.

Part of this programme has centred on the Traffic Management Improvement (TMI) scheme. Completed in April 2016 it has directly increased the Port's capacity to retain vehicles (including HGVs) within its



"It is, to date, the largest project of its kind ever undertaken", explains Walker, "and it will be interesting to see whether other ports and harbour facilities follow suit. It certainly required a substantial commitment from the UK team, and serves as a flagship for what can be achieved by taking an integrated approach to traffic flow and management."

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boundaries to reduce traffic, congestion and emissions from the town and local roads – and in doing so provide a further boost to the local economy. Previously, and at peak periods, the Dover Traffic Access Protocol (TAP) would be implemented, where heavy goods vehicles (HGVs) would queue in a facility on the A20.

The TMI was therefore designed to limit the TAP's use, and to that end the Port has created a 13-lane freight holding facility that caters for 220 outbound HGVs and has the ability (at capacity) to remove 4km of queuing traffic from the county's highways and Dover itself. In creating this space, the Port required appropriate signage, and to that end SWARCO TRAFFIC LTD. won a competitive tender from FM Conway, the TMI scheme's main contractor.

"A total of 15 variable message signs (VMS) were specified", reports Mark Hickmott, Head of Project, Service & Maintenance at SWARCO TRAFFIC LTD. "Two being used to direct HGVs into Customs or the holding facility depending on the volume of traffic (during busy periods, HGVs are required to enter the holding facility to reduce the

Port's congestion) and 13 to be installed on a 57.5-metre-long gantry at the beginning of the holding facility to give drivers clear information on which lanes to enter." Each of the signs, which were made to order within three months and include over 160,000 individual LEDs, were required to meet the Port's exacting light emission standards to both cater for its 24/7 freight needs while keeping light pollution and disturbance for local residents at a minimum.

As a part of the contract, SWARCO also installed its management software – giving the Port's operators 12 different settings (that can be altered) to choose from at any time of the day. For example, pre-setting 1 may bypass the holding facility and direct traffic through Customs; while pre-set 2 may direct traffic into the facility but would limit the number of lanes open to three out of 13. Each setting caters for a different scenario, allowing the operators maximum flexibility in directing (and re-directing) traffic to ensure the smooth flow of traffic. SWARCO also installed its barriers, operated by a traffic light system, at the end of each lane to mark the holding facility's end and instruct drivers on when to pass through. 



Andrew Walker and Mark Hickmott

MORE THAN JUST CHARGING

SWARCO'S EVOLT PUBLIC CHARGING POST CAN BE USED FOR SO MUCH MORE. IN ADDITION TO ITS BASIC FUNCTION OF CHARGING ELECTRIC VEHICLES, THE MULTIFUNCTIONAL STATION OFFERS ADDITIONAL BENEFITS FOR INFORMATION, ADVERTISING AND CITY MARKETING.



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SWARCO TRAFFIC SYSTEMS strengthened its E-Mobility Division last year both in terms of manpower and hugely in terms of the product range. The newly assembled team led by Ronald-Mike Neumeyer, former Senator for Construction, Environment and Transport in Bremen City Council, are versed in the whole range of charging infrastructure solutions. In addition to solutions for fast charging systems as well as for pedelec and e-bike riders, the eVolt Public 46 charging post is proving to be a great hit with customers. As Neumeyer explained, "along with the three charging points, the post's eye-catching 46" display sets it apart. As a result, SWARCO has enabled operators to use the charging post as more than just a "refueling" point, it can be used at the same time as an information terminal for city marketing, for instance, or as a general digital advertising column."

The decision-makers at the Düsseldorf-based energy supply company E.ON have also been persuaded by this special feature. They ordered their first batch of thirty eVolt Public 46 charging posts in January. The branding of the charging posts adheres strictly to the E.ON corporate design. From May onwards, the devices will be installed at E.ON in Düsseldorf, as well as at selected subsidiaries nationwide.

In addition to ordering the charging post, the energy giant has also commissioned the e-mobility specialists at SWARCO to customize the eVolt Public charging post for E.ON's specific needs and to integrate a service box into the complex device.

E.ON has already clearly indicated that a further 200 charging posts will follow this year. "The cooperation is going very well and is extremely promising," states Ronald-Mike Neumeyer. It represents a next step towards boosting e-mobility in Germany. <

CHARGING FORWARD

THIS YEAR IS EXPECTED TO BE PIVOTAL BOTH FOR EVOLT AND FOR THE SHAPE OF EV CHARGING INFRASTRUCTURE IN THE UK.

Innovative plans – such as for Dundee, one of Scotland's largest cities – are set to be realised in the Spring, and will redefine the availability of public charging facilities and the management of energy to better meet the growing demand from EV drivers. For the UK's charging network to be fit for the future, and worth the money invested in it, it is important that a localised infrastructure is built with foresight and consideration for how drivers will use them and how they will impact the national power grid.

The UK Government has a joint campaign with industry – Go Ultra Low – to promote the uptake of low emission vehicles. Part of this campaign is a long-term plan to invest £600m by 2020, with a recent sum of £40m being awarded to eight pioneering cities – called Go Ultra Low Cities. The first few tenders from these Cities are emerging and it is encouraging to see that they are embracing the new technical capabilities that eVolt is developing in the charging market.

"Dundee was the first of these Go Ultra Low



Cities to select a supplier – announced in November 2016 – making eVolt a trailblazer for the EV charging sector, especially in terms of the innovative approach Dundee will be taking", reports Justin Meyer, SWARCO's General Manager for the eVolt product line. At the heart of Dundee's first phase is the opening of new charging 'hubs' that will provide a concentration of fast charging points in multiple locations to give drivers better access to the power they need. Crucially, each hub will see a mix of green energy and energy storage technologies, which harnesses the power of second life EV and hybrid batteries. Stored energy increases capacity at each site and reduces the heavy demand placed on the power grid when EVs are charging simultaneously.

These hubs will be equipped with eVolt's Rapid and Fast charging units that can charge two EVs simultaneously to 80% battery life within 30 minutes and an hour respectively. Among the 14 Rapid chargers that are being installed, Dundee has chosen six of eVolt's next generation Raption 50 model (launched in the UK last September) – which have a 47-inch LCD screen to offer customers a further revenue generation opportunity. Dundee is a very familiar area for eVolt, having been installing its charging equipment across the city for the last five years. Partly as a result of this, the City is

able to claim to have the most established EV charging infrastructure per capita in terms of area than any other city in the UK.

To date, eVolt is the preferred supplier to 24 out of Scotland's 32 local authorities, and its chargers are installed far and wide, from the Outer Hebrides to Aberdeen, Argyllshire and Edinburgh to name a few. Putting this into figures, over 1,000 eVolt charge point are in operation in Scotland, and that equates to an impressive 72% – and growing – market share. <



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evolt





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Marking Systems Division

FOUR QUESTIONS TO SWARCO'S COO'S

DRIVE ON (DO) INTERVIEWED SWARCO'S EXECUTIVE BOARD MEMBERS PHILIPP SWAROVSKI (PS) AND MICHAEL SCHUCH (MSCH) ON CROSS-LINKING AND FUTURE OPPORTUNITIES OF MOBILITY.

DO: *Traffic volumes will continue to grow in the years to come especially in cities and metropolitan areas. How does this affect our daily mobility needs?*

PS: I am convinced that the cities of tomorrow lacking appropriate concepts will be suffocated by traffic. The cities of the day after tomorrow will be highly efficient, and mobility will then be oriented at the actual needs of the people. In such urban areas we will no longer speak of the car, but of the mobility system which enables the travellers to reach their destinations as effectively, quickly, conveniently and environmentally sound as possible.

MSch: It is indeed a huge challenge to ensure efficient mobility also in the future in view of the ever-growing urbanisation. Just

have a look at the alarming situation in numerous agglomerations around the globe. We are confronted in the coming years with a significant technological transformation. This not only concerns vehicle concepts, lightweight construction, sustainable propulsion systems and electro-mobility, but also the development of semi-autonomous or fully autonomous vehicles, and this over all traffic modes. At the same time information and communication technologies further penetrate all areas of life – in particular the organisation of mobility in the digital age. For young people it is much more important to own a smartphone rather than a car. If people today ask "which car fits best to my lifestyle or which one can I afford", they will ask in the near future "which means or modes of transport do I need today to optimally travel from A to B".

DO: *Which role will SWARCO play in this changing environment?*

PS: Our customers expect holistic solutions, and the mobility systems of the future will communicate with each other. SWARCO





Michael Schuch, COO ITS Division

therefore has joined many research projects which exactly focus on these issues. Jointly with universities and carmakers we work at linking the vehicles and the road. In this work we notice that road marking systems and ITS solutions cannot be dealt with independently of each other. Road markings and guidance systems will continue to remain essential components of the safety package for the travellers. You can read more about this in the article by Robert Dingess on pages 24 and 25 of this magazine. Road markings might be functionally pumped up in the future to become „intelligent“, for instance by integrating nano sensors.

MSch: We have to address this change by setting ourselves ambitious goals and by radically rethinking today's traffic control and mobility management concepts. In particular information for individual mobility will be in the focus. The use of numerous sensors will make available exact and reliable mobility services in space and time. Comprehensive data processing from various mobility-related sources is THE challenge of the future in order to cope with the predicted growth within a limited infrastructure with as little friction as

possible. We want to help our customers in successfully designing the change from conventional traffic management to the delivery of value-added services of the digital age.

DO: SWARCO already today cooperates with the automotive industry to develop tomorrow's mobility solutions. How will the travellers benefit from this cross-link?

PS: Visual driver assistance systems, as built into modern vehicles today, rely on good road markings, because the „eyes“ of the cars travelling on roads that cars can „read“ need marks of orientation. There are many future scenarios of vehicle-to-infrastructure communication, from satellite-based systems to in-road magnets with guidance function.

MSch: The connected car, V2X or cooperative systems are particularly important topics in which we have and will go on to invest. The closing of ranks with the automotive industry is a very important step for us to respond to future mobility needs. Our current activities focus on maximizing convenience and increasing traffic safety through information for individual mobility. Speed recommendations in the dashboard to optimally use the green time at intersections or systems which help vehicles park autonomously are among our first successful pilot projects. In future, drivers will be provided only with those up-to-date travel and traffic data that are really relevant for the individual trip.

DO: Trend researchers predict that in view of autonomously driving cars road markings and traffic lights might have disappeared in twenty years from now.

PS: It is my conviction that road markings will continue to fulfil their function as backup system and safety element also in twenty years from now, giving orientation and saving lives, even though many of our vehicles will by then travel completely driverless. I think it

will still be a very lengthy process until road infrastructure will be entirely different from what we are used to today.

MSch: Of course we have a close look at such studies and future scenarios. As already mentioned before, we have to radically rethink today's traffic control concepts, which obviously bears a certain risk for many industrial corporations like SWARCO, but at the same time offers great opportunities. SWARCO so far has distinguished itself from competition for instance by brilliant signal technology, but already today our customers appreciate our technological know-how and innovative mobility solutions as well as value-added services which further extend our portfolio. Traffic-related information is no longer solely communicated by traffic lights, VMS or similar. Smartphones and direct communication into the car have become increasingly important in this field.

DO: Thank you for your time, Gentlemen.





IMAGINE CYCLE PATHS AND THEIR INTERSECTIONS WITH ROADS THAT HAVE NO STREET LIGHTING. IN THE MORNING OR EVENING WHEN IT IS STILL DARK, THE COURSE OF SUCH CYCLE PATHS IS DIFFICULT TO IDENTIFY, OFFERING LITTLE SAFETY AND ORIENTATION TO CYCLISTS. THIS CAN BE CHANGED: WITH AFTERGLOW MARKING SYSTEMS BY SWARCO.



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WHEN CYCLE PATH MARKINGS GLOW IN THE DARK

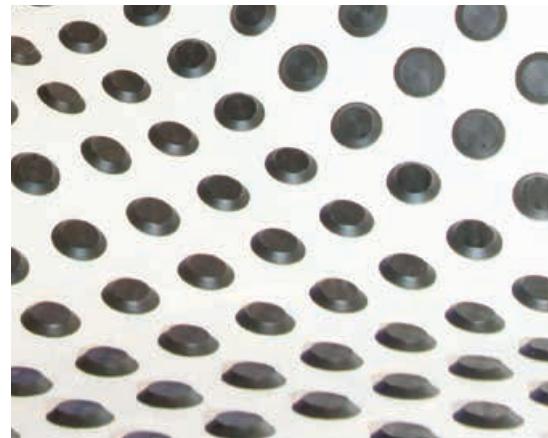
SWARCO Afterglow Marking Systems, developed in cooperation with pigment specialist NighTec, are markings which store UV light during the day and emit it in darkness in a yellowish or blueish colour“, explains Heidi Ehlert, Head of R&D with German market leader in road marking systems, SWARCO LIMBURGER LACKFABRIK in Diez, Rhine-Land-Palatinate. Duration and intensity of the afterglow effect depend on the amount of afterglow aggregates and the layer thickness of the marking and can reach between 8 and 10 hours. The punctually afterglowing aggregates are perceived at larger distances as a continuously illuminated marking. Afterglow systems not only do a good job on cycle paths, but also constitute an interest-

ing and cost-effective alternative to artificial lighting at blackspots, dangerous curves and in unlit parks.

SWARCO PROVIDES THE FOLLOWING AFTERGLOW SYSTEMS:

- 2-component afterglow plastic
- 2-component coldplastic (transparent), with drop-on afterglow aggregates
- 2-component coldplastic (transparent), with drop-on light aggregates (50:50 mix of afterglow aggregates and reflective glass beads)

Afterglow systems are innovative SWARCO markings offering better orientation in the dark on cycle paths and in parks and thus enhancing (road)safety for cyclists and pedestrians.



EUROTAC – TACTILE GUIDANCE FOR THE VISUALLY IMPAIRED

HOW CAN TRAIN STATION PLATFORMS, WAITING ZONES AT ZEBRA-CROSSINGS, WALKWAYS AND CORRIDORS IN BUILDINGS BE EASILY RETROFITTED WITH A TACTILE GUIDANCE SYSTEM FOR THE VISUALLY IMPAIRED? SWARCO ANSWERS THIS QUESTION INTELLIGENTLY WITH EUROTAC.

Mobility is a basic social need. In order to facilitate the participation of visually impaired or blind people in everyday life, special tactile guidance systems are an important cornerstone in improving the quality of life.

EUROTAC are DIN 32984 conforming pre-formed pavement markings made of methacrylate. Combining raised dots and grooves with a flexible self-adhesive polymer carrier, EUROTAC represents an innovative, universally utilizable orientation system for the blind and visually impaired. The product is particularly suitable to practically and economically retrofit tactile guidance systems, a job which normally requires quite substantial construction works. EUROTAC sticks to asphalt, concrete, stone pavings and even granite or marble floorings. In public space

EUROTAC provides longitudinal and transversal orientation, guidance and warning, as for instance at pedestrian crossings or tram and bus stops. The black and white colour contrast is optimally perceived by the visually impaired. The shape and design of the marking supports blind people to find their way by tactile means. EUROTAC can even be an interesting option for smooth high quality indoor floorings.

„EUROTAC tactile guidance systems are an essential contribution to make public space barrier-free and better accessible for the handicapped, thus improving the quality of life and mobility of the blind and visually impaired“, summarizes Michaela Reitner, Marketing Manager Europe within SWARCO's Road Marking Systems Division.



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ROAD MARKINGS AND AUTONOMOUS DRIVING SYSTEMS

ROAD MARKINGS WILL REMAIN CRUCIAL FOR ALL TYPES OF GUIDANCE SYSTEMS AS WE ENTER THE AGE OF MIXED-LEVEL AUTONOMOUS DRIVING. ROBERT N. DINGESS, CEO OF THE US-BASED MERCER STRATEGIC ALLIANCE, AND POLICY DIRECTOR FOR A GLOBAL ROAD MARKING ALLIANCE, EXPLAINS WHY.

Properly installed and well-maintained road markings provide guidance for motorists, pedestrians and cyclists. While an essential roadway safety device today, I am often asked if markings will continue to serve a similar purpose with the advent of machine driven systems. Significant auto industry press reports have speculated that the day will arrive when we no longer need traditional traffic control devices (signals, signs, markings). While it is difficult to speculate on the speed of advances in technology, it is much more likely that, with few exceptions, roadways 50 years from now will look very much like roadways today.

Road markings may actually increase in importance as more automated vehicle systems are deployed. Fully understanding why this is the case requires a brief review of how automated vehicle systems are defined and operate. The Society of Automotive Engineers (SAE) and the U.S. Department of Transportation recently released documents describing five levels of automation. These levels better define the role of both human and machine systems in the guidance of vehicles.

Level one automation provides driver assistance through either enhanced braking, providing lane tracking or warning if the vehicle drifts beyond road markings. Level two

automation integrates these technologies into an enhanced cruise control and guidance system designed to steer vehicles using road markings. Some level two systems can operate by locating the vehicle in front and simply following the same lane track. In level one and two, human drivers are expected to monitor the vehicle and ensure that systems are performing safely. The Tesla™ model S is an example of level two automation. Since these vehicles often directly interface with road markings, proper marking installation and maintenance practices are essential. The SAE and the American Society of Highway and Transportation Officials (AASHTO) are working to develop a joint road marking specification designed at supporting level two machine vision technologies.

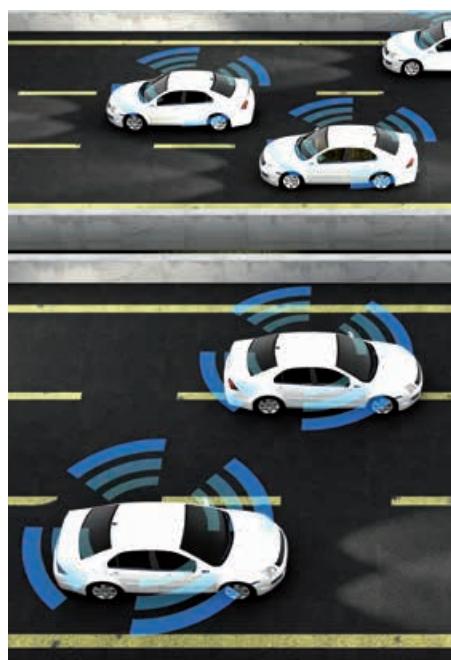
Transitioning from level two to level three automation is difficult. It requires significant advances in policy, process and technology. Most manufacturers seeking to develop level three automation are incorporating new laser based technologies such as LiDAR with the goal of creating a 360 degree "visual" field of view. Others are hoping to develop digital infrastructure maps that scan and recreate



the road virtually. Some seek to combine some variation of all these technologies into a series of redundant steering and guidance systems. Under level three, the human driver can safely turn over driving the vehicle to the automated system. Human drivers are expected to retake control of the vehicle when warned by the system. No standard has been set regarding how much time is enough to safely expect a human driver to re-engage. It is likely that level three automated vehicle systems will initially be deployed in highly controlled settings (Bus Rapid Transit, toll roads). A level four automated system can operate safely in all but a few environments (snow, severe rain). Once engaged by the driver, the automated system operates without driver attention.

A level five automated system requires no human interaction. There are many reasons to believe that regardless the level of automation, road markings will retain its importance for the foreseeable future. First, there are no commercially available level 3-5 automated vehicle systems today. Secondly, there are many experts who believe that the complex nature of roadways will delay the deployment of full level five automation as far as 50-75 years into the future. Thirdly, regardless of the rate of automated system progress,

future roadway agencies will likely continue to maintain roadways for a mix of human, machine and fully automated systems well past 2050. In this shared environment, markings will likely increase rather than decrease in importance. Level three and level four automation will benefit from enhanced uses of road markings to safely navigate systemic problem areas such as work zones. It is far more likely that specially designated marking colors, such as orange for work zones or purple for toll lanes, will be increasingly used to assist machine vision systems. While the 21st century may be remembered as the age of automated transportation, it should also result in a robust and thriving market for road markings.



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SUPERIOR ROAD MARKINGS WITH HIGH PERFORMANCE BEADS SOLIDPLUS

HORIZONTAL ROAD MARKING SYSTEMS CONSIST OF PAINTS AND GLASS BEADS. IN A „SYMBIOTIC” RELATIONSHIP, THE PAINT LAYER FURNISHES THE DESIRED COLOUR, SURFACE FOR RETROREFLECTION (RL), AND RETAINS THE GLASS BEADS, WHILE APPROPRIATELY EMBEDDED GLASS BEADS PROVIDE RL AND SIMULTANEOUSLY PROTECT THE PAINT.



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The performance of road markings plays quite an essential role when it comes to visibility, mobility scenarios such as smart driving and autonomous vehicles. Ensuring potential reduction of accidents and saving lives requires a minimum intervention policy. The European Road Federation recently proposed the 150x150 formula to maintain at all times $RL > 150 \text{ mcd/m}^2/\text{lx}$ and $RW > 35 \text{ mcd/m}^2/\text{lx}$ (at present, in most cases the drop of RL to 100 $\text{mcd/m}^2/\text{lx}$ is permitted).

However, SWARCO-proprietary SOLIDPLUS technology delivers enhanced performance compared with standard glass beads:

- Retroreflectivity values up to 1000 $\text{mcd/m}^2/\text{lx}$,
- Increased retroreflection under wet conditions (RW),
- Higher resistance against mechanical impacts.

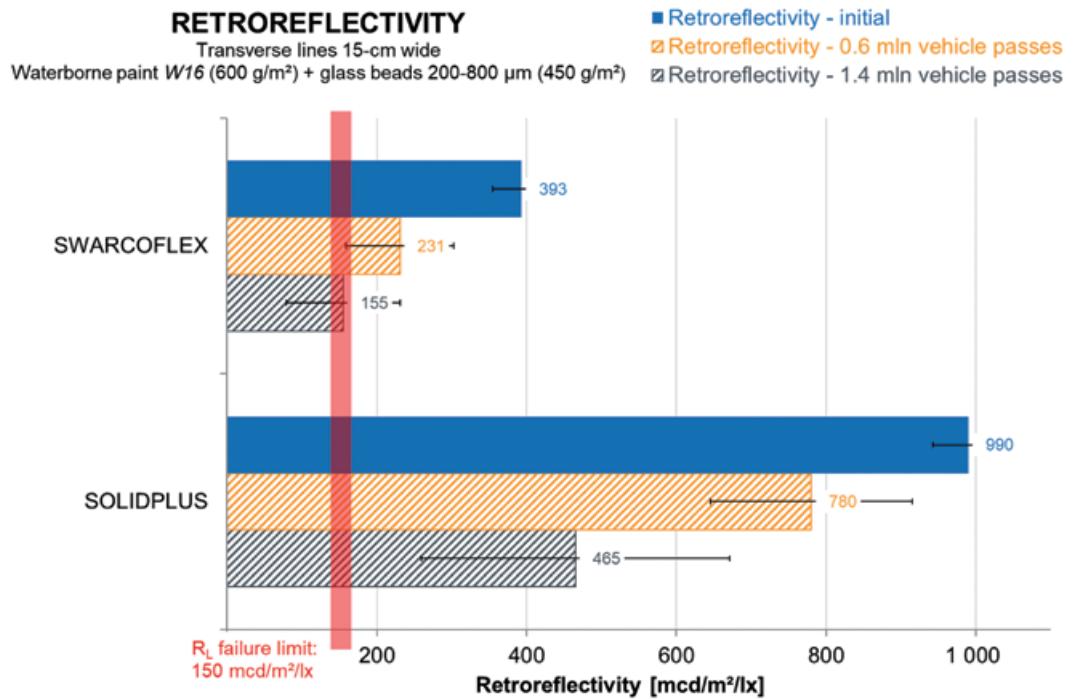
The capability of SOLIDPLUS in combination with waterborne paint W16 was tested in a side-by-side experiment with standard glass beads. Transverse lines, 15 cm wide, were applied at a road with Average Daily Traffic (ADT) of 7346 vehicles (including about 8% articulated lorries). After a winter exposure (0.6 million vehicle passes), the results were excellent: RL losses were only minor and both evaluated systems passed easily. After one year (over 1.4 million vehicle passes), a further drop in RL expectedly occurred. However, SOLIDPLUS beads were still providing RL exceeding 450 $\text{mcd/m}^2/\text{lx}$. Data extrapolation to predict a failure point has shown that road marking systems with SOLIDPLUS glass beads were employed only at 40%

of its useful life. The superior results achieved with SOLIDPLUS were also measured under wet conditions. SOLIDPLUS beads delivered exceptional wet night retroreflectivity (RW) both initially and after the winter exposure (0.6 million vehicle passes). After one year, SOLIDPLUS RW values were still very high, but a failure occurred around 1.0 million vehicle passes. The use of standard glass beads not only resulted in lower initial RW, but also a failure occurred within only 0.4 million vehicle passes. One must keep in mind here that for Type II markings designed to meet RW requirements, glass beads with diameters up to 1400 μm are typically used, whereas in this trial beads up to only 800 μm were used.

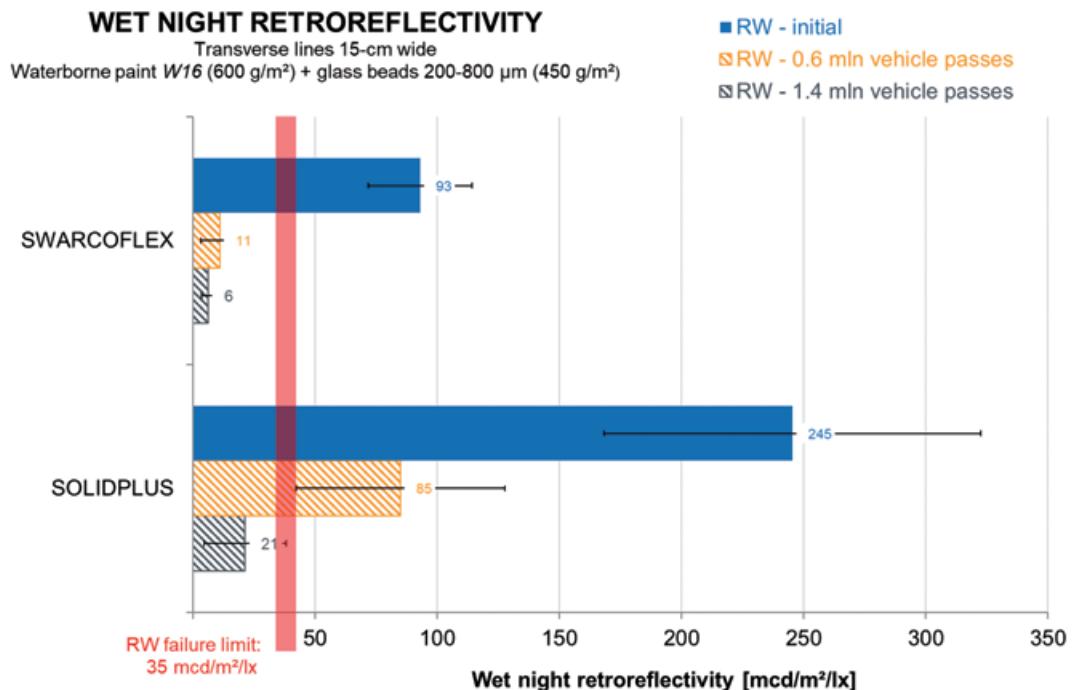
In conclusion, a road trial where a known number of vehicles passed the marked lines has clearly shown the advantage of SOLIDPLUS glass beads over standard glass beads in terms of providing

- exceptional retroreflectivity,
- excellent retroreflectivity retention,
- superior wet night retroreflectivity.

Additional retroreflectivity and durability can benefit the applicators seeking to fulfil the minimum RL requirement for performance contracts. Several scientific reports prove that increased RL is leading to lowering the number of accidents; hence, the use of SOLIDPLUS glass beads will increase road safety. Furthermore, it was found that elderly people focus on retroreflectivity while driving in darkness, so markings with very high RL will augment their mobility. <



Retroreflectivity (RL) achieved with standard and SOLIDPLUS glass beads during road test.



Wet night retroreflectivity (RW) achieved with SWARCOFLEX and SOLIDPLUS glass beads during road test.



A PORTRAIT OF MCCAIN,
NEWEST SWARCO
FAMILY MEMBER

COMPANY IN FOCUS: MCCAIN, INC.

Walk the halls of McCain's corporate headquarters in Vista, California and you'll immediately recognize the company's Southern California heritage. From the laidback dress, to water cooler talks about American football, to afterhours get-togethers at one of the many local microbrews, the company's low-key vibe is permeating. But don't let the sea breeze and sunshine fool you. McCain is comprised of a fierce group of designers, thinkers, and creators. A passionate team of experts who work round-the-clock to deliver solutions that improve the daily lives of millions. A team ironclad in its desire to lead the industry and who affectionately

call themselves, Team McCain – the newest member of the SWARCO family.

NOT JUST THE NEW KID ON THE BLOCK

Like SWARCO, the passion and drive that embodies Team McCain, can be traced back to its roots. McCain was founded as a small signal manufacturing shop in 1987 by an ambitious electrical contractor tired of incurring project delays at the hand of equipment manufacturers. His mantra was, why wait when I can build it myself. So began McCain, a company that, in the great words of Ralph Waldo Emerson, "does not go where the path may lead, but goes instead where there is no path and leaves a trail." Today, Team Mc-



McCain Sales Team at their January 2017 team building event

Cain is comprised of more than 500 dynamic professionals who design, build, and deliver a diverse solutions portfolio. From traffic control equipment—signals, cabinets, controllers, and signs—to local and regional systems for advanced transportation control, McCain is committed to providing both time-honored and cutting-edge solutions for mobility.

BLAZING THE ROAD AHEAD

As technology continues to permeate every aspect of our lives, the transportation industry is at the precipice of change, faced with reinventing itself or waiting for others to do it. Backed by SWARCO, the world's foremost authority on all-things transportation, perhaps no company is better positioned than McCain to drive the industry forward and reimagine what it means to be a leader in the US mobility market.

With a steadfast focus on developing connected devices that gather data every tenth of a second, McCain is hard at work bringing the latest technology and the internet of things right to the intersection. As with most technologies we encounter daily, the real power comes from data. In this case, collected data about signal status and user demand can be analyzed and shared with engineers, connected vehicles, and drivers through mobile apps - such as SWARCO's Traffic Light Assistant (TLA) - like never before.

As technology progresses, greater advances and innovation will come through artificial intelligence and machine learning that promises an unrivaled ability to predict and respond to live demands. Whether talking to cars, other infrastructure devices, drivers, or pedestrians, the result will be the same – smarter, more



The Backpack Cabinet, McCain's smallest and smartest cabinet yet

efficient road systems that are better for the general health and wellness of our communities and the environment.

BETTER TOGETHER

In a year that marks both McCain's 30th in business and first as part of the SWARCO family, there is a lot to celebrate in 2017. Even though you may often find Team McCain enjoying the sunshine and a cold brew, these beach-loving Californians are eager to prove what good old-fashioned American grit can bring to the new world of mobility and its SWARCO family. And, if past success is any indication, there is no doubt that the acquisition and integration of McCain is a giant step forward in helping SWARCO achieve its vision of being the first choice in road safety and intelligent traffic management worldwide. <



LIFELINE

- **1987** MCCAIN WAS FOUNDED
- **1991** BEGAN MANUFACTURING CONTROLLERS AND CABINETS
- **1996** OPENED MANUFACTURING IN MEXICO
- **2000** ENTERED ITS MARKET
- **2016** JOINED THE SWARCO FAMILY

COMPANY FACTS



PRODUCTS IN **11** COUNTRIES



20 DISTRIBUTORS
500+ EMPLOYEES



MICHAEL SCHUCH
PRESIDENT/CEO

Learn more about McCain and its portfolio of solutions at www.mccain-inc.com.

PROTECTING OUR TECHNOLOGIES FROM CYBER-ATTACKS



IN THE AGE OF DIGITAL TRANSFORMATION AND WITH THE ADVENT OF THE AUTONOMOUS CAR, PRIVACY AND DATA PROTECTION ARE CRITICAL ISSUES TO FOCUS ON. SWARCO'S ITALIAN SUBSIDIARY IS PART OF THE EXPERT GROUP ON EUROPEAN LEVEL TO FIND SOLUTIONS THAT PREVENT CYBER-ATTACKS IN V2X COMMUNICATION.

"Connected vehicles offer huge opportunities for innovative features and services: the more we secure these systems, the more secure we all are."



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Turin-based SWARCO MIZAR is one of nine European partners selected in January 2017 by the European Commission to implement a flexible and efficient assurance framework for security and trustworthiness of Connected Vehicles and Vehicle-to-X (V2X) communications, aiming at improving the cyber-physical security ecosystem to protect connected vehicles from cyber-attacks. "The purpose of the project SAFERtec is to deliver innovative techniques, development methods and testing models for efficient assurance of security, safety and data privacy of Information and Communication Technologies related to Connected Vehicle and V2X systems", says Silvia Capato, R&D Technology Manager with SWARCO MIZAR. "This is a crucial topic, given the increased connectivity of automotive ICT systems, consumer electronics technologies and telematics applications, services and integration with third party components and applications." A cornerstone of SAFERtec is to make security, safety and privacy aspects related to Connected Vehicles measurable, visible

and controllable by stakeholders and thus enhance confidence and trust in Connected Vehicles. The potential danger was dramatically illustrated when two white-hat hackers remotely took control of a Jeep Cherokee and cut its transmission on the highway as part of a research initiative. The well-publicized incident prompted Chrysler to recall 1.4 million vehicles. It is evident that connected vehicles create new challenges for innovative features and services that in turn increase vehicles' cyber-attack surface.

The main tasks of SWARCO MIZAR are related to the design and deployment of the Road ITS Station and the Cloud Infrastructure based on OMNIA Central ITS Station integrating security aspects in line with available guidelines and potentially introduced by the project standards.

The experience in SAFERtec will be beneficial for the future business development of the company, taking the existing solutions beyond the state of the art and making traffic management and control available also for autonomously driving vehicles. <



EVENT CALENDAR

GET IN TOUCH WITH SWARCO AT THE FORTHCOMING EVENTS:

| | | |
|---------------------|------------------------|----------------|
| 4 – 6 April 2017 | TRAFFEX / PARKEX | Birmingham UK |
| 24 – 26 May 2017 | INTERTRAFFIC ISTANBUL | Istanbul / TR |
| 19 – 22 June 2017 | ITS EUROPE CONGRESS | Strasbourg / F |
| 29 / 30 June 2017 | KOMMUNALMESSE | Salzburg / A |
| 4 / 5 July 2017 | MOBIL.TUM Conference | Munich / D |
| 9 – 11 October 2017 | EVS30 | Stuttgart / D |
| 29 Oct – 2 Nov 2017 | ITS WORLD CONGRESS | Montreal / CDN |
| 14 – 17 Nov 2017 | IRF WORLD ROAD MEETING | Delhi / IN |
| 18 – 23 March 2018 | LIGHT + BUILDING | Frankfurt / D |
| 20 – 23 March 2018 | INTERTRAFFIC AMSTERDAM | Amsterdam / NL |

SWARCO RAIDERS TIROL HOME GAME BOARD



| COMPETITION | DATE | START | GUESTS | STADIUM |
|---------------|------------|---------|---------------------------------------|-------------------|
| AFL | 01-04-2017 | 14.30 h | Dacia Vikings [Vienna] | Innsbruck Tivoli |
| AFL | 29-04-2017 | 14.30 h | Rangers [Mödling] | Innsbruck Tivoli |
| CEFL | 06-05-2017 | 18.30 h | Triangle Razorbacks [Velje - Denmark] | Innsbruck Tivoli |
| B4T | 27-05-2017 | 18.30 h | Benedictine Ravens [Kansas - USA] | Innsbruck Tivoli |
| AFL | 03-06-2017 | 17.00 h | Projekt Spielberg Giants [Graz] | Innsbruck Tivoli |
| CEFL BOWL | 10-06-2017 | 18.30 h | TBD* | Innsbruck Tivoli* |
| AFL | 17-06-2017 | 16.00 h | Cineplexx Blue Devils [Hohenems] | Wattens |
| AFL | 24-06-2017 | 16.00 h | Danube Dragons [Vienna] | Wattens |
| AFL Semifinal | 22-07-2017 | 18.30 h | TBD* | Innsbruck Tivoli* |

*subject to qualification



TAKE A
NEW DIRECTION
IN TRAFFIC
MANAGEMENT

SWARCO – the traffic technology corporation of Austrian entrepreneur Manfred Swarovski – is your partner when it comes to managing 21st century mobility challenges with focus on safety, environment and convenience.

Jointly with you, our business partners,
we take a new direction in traffic management
to better serve the needs of authorities and road users alike.

If you seek the partnership with an experienced industry player who follows the integrated approach to road safety and sustainable traffic management, then SWARCO is your first choice.

Talk to us first.

SWARCO | First in Traffic Solutions.