SWARCO's leading idea is to improve quality of life by making the travel experience safer, quicker, more convenient and environmentally sound.
For this purpose, the Austrian traffic technology corporation produces and provides a large range of products, systems, services, and turnkey solutio
in road marking, urban and interurban traffic control, parking, and public transport. Cooperative systems, infrastructure-to-vehicle communication, electromobility, and integrated software solutions for the Livable City are latest fields in the group's portfolio.

Our 5300 traffic experts are keen to shape together with you the transition from conventional traffic management to value-added services fit for the traveller in the digital age
www.swarco.com


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## ONE BRAND

 ALL SYSTEMSSWARCO Traffic Solutions

SWARCO smart mobility solutions respond to the needs of society in the digital age and make the travel experience

.... SWARCO road marking solutions
.... by showing the way worldwide and saving lives every day. With our high quality
systems and services, we safely direct traffic from A to B , day and night. On all roads, in any weather. Today, SWARCO has grown into the world's largest system provider for road markings.
Jump in and drive with us.




TECHNOLOGY INES for controlling 1,685 intersections thereof around 300 running in Adap five Network Control mode; Platform independent architecture; Multiconsoling technology enabling the integration of further systems as the police control center (HELS), the Federal Reporting Office (TIC) and the management program of the municipal traffic signal systems
project duration 2011-2013
swarco traffic management ubeban solutions
INTEGRATED TRAFFIC CONTROL CENTRE CET TO GRIPS WITH TRAFFIC WITH 24 LED CUBES

When the Hamburg police wanted to move the traffic control centre of the Hanseatic city from the 1990s into the new millennium, the project was officially put out to tender. With its innovative concept, SWARCO prevailed against seven competitors What exactly was it about? Germany's port metropolis Hamburg was to be give a modern, inteligent traffic management systern hat would always provide a perating system for all connected systems.

Put plainly: It must be possible to intervene in traffic at any time, to influence current developments and to guarantee maximum safety. Not least, the Hamburg system should continue to steer and control Hamburg safely in the future. This is also about
a reliable power supply in order to avoid technical failures. It was also the customer's wish that the new traffic control centre should play all the parts ergonomically.

THE PARTICULAR CHALLENGE OF THE PROJECT

You guessed it: Just because Hamburg's traffic management is being adapted
to the state of the art, the traffic in the Hanseatic city will not stop! Quite the opposite: As a tourist magnet, the North German port city enjoys grea popularity all year round, which is also evident on Hamburg's streets. Thus, the particular challenge of the project was to guarafility of the trafic control center avalabily of the tratio to provide strim anase and to provide an therims. SWARCO's solution: All workstations were moved fo five compartments, the compors a separate technical room The contro
and switching of the systems was guaranteed from beginning to end without interruption.

EYE-CATCHER LED VIDIWALL
As a long-standing partner of the City of Hamburg, SWARCO also impressed with its professionalism, innovation and reliability in this project, which was mplemented by the general contractor SWARCO TRAFFIC SYSTEMS, Let's lk about some technical facts and lgures: The eye-catcher of the new TCC is the $4 \times 6 \mathrm{~m}$ LED wall, consisting
of 24 LED cubes, for displaying and controlling the approx. 80 cameras installed in the entire city area. But all connected systems are also controlled via the integrated user interface: the traffic computer system with approx ,8rfic signal programs, the network and traflic control systems (NBA and VBA), ala or city of Hamburg Of course, all workstations are interconnected This o-clled multionsoling mat - min in computer can intervene at any time

## Kleve

## Germany

the Challenge
nstallation of an environmentally friendly signalized intersection with lowest possible energy consumption while leveraging the existing cable network

SERVICES
Supply traffic light controller TLC, poles and traffic lights; Build and maintain entire traffic light controlled intersection

TECHNOLOGY
ACTROS traffic light controller based on SWARCO X-LINE technology platform, SWARCO FUTURIT traffic lights

PROJECT DURATION
March - August 2018

INNOVATIVE TRAFFIC LIGHT SYSTEM DEPLOYED

On August 24, 2018, Kreis Kleve Bauverwaltungs-GmbH, together with the manufacturer SWARCO, put a novel traffic light control system into operation, setting new standards in terms of environmental friendliness. It is based on the intelligent SWARCO X-LINE platform.

The new traffic light control system regulates traffic at the intersection "Lindenallee Merowingerstraße - Römerstraße". Compared to the predecessor system, the total energy consumption of the system can be significantly reduced

When the modernization of the traffic light control system "Lindenallee / Merowingerstraße - Römerstraße" was due, the Kreis Kleve BauverwaltungsGmbH decided to take a big step. The aged bulbs in the signals were supposed to be replaced by LEDs. The choice fell on the latest generatio of signals efficiently generating the necessary light: The former light bulbs
were replaced by intelligent LED units that monitor themselves. This enables signal lights with a power consumption in the range of only 1 Watt.

The environmental friendliness results not only from the energy savings but also from the possibility of saving cables and copper. Both effects result from the concept of distributed intelligence that
underlies SWARCO X-LINE The control echnology of a traffic light control ystem is no longer located exclusively a control cabinet at the roadside, but istributed to control cabinet, pole and signal head.

The "SWARCO X-LINE" innovation herefore essentially comprises a completely new pole unit and low-energy
signals specially designed for this technology. Both components can eve be combined with existing traffic light controllers, allowing existing systems to be converted to "SWARCO X-LINE" Another advantage of this intelligent plafform is the easy expandability of "SWARCO X-LINE" systems and the associated future-proofing


Ewarcot taffic management ubean soutions
GREEN WAVE
FOR RESCUE SERVICES

FAST AND PROTECTED TRAVEL ACROSS INTERSECTIONS WITH C-ITS
In an emergency, every second counts: Firefighters and other rescue teams have to get to thei place of work as quickly as possible. In a pilot project, the city of Ludwigsburg and SWARC have successfull introduced the prioritization of fire engines al trafici lights. In contrast to revious systems, Ludwigsburg uses V 2 X communication (V2X $=$ Vehicle to Everything). The fire engines com muicate drecly win he racic ighs by standarazed shor--ange racio to provide digital traffic control technology to make traffic flow smoother and to reduce emissions.

Three firefighting vehicles are currently equipped with transmitters: the operations management vehicle, the firefighting vehicle and the environmental equipment vehicle. All three vehicles are usually involved a servic case. The traffic lights along the B 27 were Straße" to the "Forum" building with the Straße" to the "Forum" building with the necessary antennas. They are able to receive Every second, the emergency vehicles send their position and speed directly to the
raffic light controller. There, the signals are rocessed and compared with the scenarios stored in the programming. If the system etects an approaching emergency vehicle, the programmed signal sequence is started: he traffic light sontrol sequice is sar ioritization program One the fireforts have passed the intersection, the traffic light antrler switches back to norma as quickly possible to minize fric dis as possibe to mimize tranco dstrbance. As astablished fully autor estabished fuly autonomously, using

For many years, SWARCO has been
ring trans infrastructure for connected, cooperative and automated driving. The fire department prioritization is a first practical application of the underlying V 2 X technology.

SWARCO is a partner of the innovation network "Living LaB", in which the city as well as partners from business, industry and research institutions work together in a unique and cooperative manner. Innovative technologies can be tested and developed
 partners

swarcot taffic manacement uban solutons
TRAFFIC DATA COLLECTION WITHOUT DATA JAMS WITH GECKO2TRAFFIC

The Hessian State Agency for Nature Conservation, Environment and Geology (HLNUG) would like to analyze the relationship between pollution and the actual traffic volum SWARCO offers the right networked technology for this: the Gecko2Traffic traffic with of the hion
 of the city by quantity and tation wer in ime wiat of , Th ding to TLS BASt) will be compared with those of the environmental monitoring station.

Ther restit Adrect olation betwer the measured values of the environmental measuring station (pollutant load) and the actual traffic volume (quantity \& type) could be established and analyzed

FROM THE ROAD DIRECTLY INTO THE SYSTEM

However, for traffic data to be comparable with environmental data, the data must be provided at a certain ageregation and time interval This is managed by our parner company A-l-P (Ambient Information Processing GmbH ) from Vienna. The Perators of the HLNUC' envirne data evaluation platform simply collect the
data from SWARCO Clod ransfer it to the HLNUG's environmental measurement system.

GECKO2TRAFFIC DOES EVERYTHING AGAINST DOWNTIMES

For example through automatic evaluation and analysis: Using web-based access via browser, traffic data can be retrieved at ny time from a PC/notebook or mobile evice. In addition, Gecko2Traffic has an utonomous power supply (rechargeabl ory, solar) and data transmission to consuming cabing and connectio wark. Gecko2Traffic co lers can also
 to another location without great effort. And there is no need for time-consuming commissioning. The device is simply registered in the SWARCO Cloud using a mobile phone (QR code) and is immedately ready for operation. The resul is Wowts maine was abe to quickly offer its customers was able to quickly regard to the connection and compatibility gro dir ll, our customers, their workstom. A , as shold never be held up pointessly

## BICYCLE WAVE FOR OBERHAUSEN

The city of Oberhausen in the Ruhr area already had a well-developed network of cycle paths, which has now been decisively optimized. With SWARCO's socalled "Radwelle Oberhausen", cyclists can now reach their destination even faster and safer. Well-marked cycle paths meander through the entire urban rea oberhausen so that every corner can be easily reached on wheels Nevertheless, the people of Oberhausen preferred to get into their cars or use public transport. Why? The traffic lights were mainly optimized for public transport - so crese the proption of cyclists, waiting times had to be significantly reduced e of the mop lied on the expertise of SWARCO in this case. As all the traffic light systems came rom SWARC from SWARCO anyway they could be converted at low cost

CYCLISTS SEE GREEN
The main cycling route network of the city of Oberhausen covers 67 km with a total of 191 traffic light systems. The aim now was to significantly improve the switching at the individual junctions for cyclists and thus increase comfort. He SWRCO solution: With the hep of 8 therma delion -eonsing 11 induction loops -cycle traffic is accelerated by cyclist pre-detection Detectors enable intligent dignaling system This means that
s soon as the cyclist approaches the traffic light, it switches to green or - if it was already green - the green phase is extended. This keeps the cyclists in the low, making them faster and bringing hem more comfortably and safely to位 ess and PR FOR A WAVE OF ENTHUSIASM

The main advantage of the Green Wave is a significant increase in the attractiveness of the cycling network.

This results in a reduction of CO 2 emissions, which in turn benefits the environment and quality of life. Not to forget: The shortened waiting times red light violations and thus improved red light violations and hus improved generarco stenco no mine mow extensive technical know-how, but also posters, 10,000 flyers, 1,000 stickers 3 PVC banners 1000 saddle 2 displays, 2 beach flags and above all the name and logo of "Radwelle 0ben"

## Skopje



SWARCO TRAFFIC MANAGEMENT - URBAN SOLUTIONS
AUTOMATED TRAFFIC MANAGEMENT FOR THE CITY OF SKOPJE

The City of Skopie decided to extend and upgrade the overall traffic management system and applied for a loan from the EBRD. The funding enables to create a new uutomated Traffic Management System (ATM) for more than 90 intersections in educing emissions ond fuel consumption Plan SWARCO implemented a fully adaptive system (OMNIA/UTOPIA) that monitors and manages traffic signals at 94 intersections across the city of Skopie

The SWARCO solution utilizes e.g. up to 80 ITC-2 traffic light controllers, 850 inductive loop vehicle detectors, a fiber optic cable network of approximately 50 km , a closed-circuit television
(CCTV) traffic monitoring system with 51 cameras and five overhead variable message signs (VMS). The project was successfully implemented and the system harmonizes traffic conditions


SWARCO's dynamic guidance systems help keep traffic in motion on highways and expressways, providing orientation and timely warnings, avoiding congestion, reducing emissions and informing about alternative routings and speed limits. Safety is particularly important when it comes to tunnels. SWARCO offers integrated systems that manage both the operation of tunnels and the traffic
passing through them.

## Bavaria /

Schleswig-Holstein

## Germany

the Challenge Implement a modern software solution for automated diversion of trucks, buses or cars (individually or groupwise)

PROJECT DURATION
July 2017 - ongoing


GOODS TRANSPORT CHECKPOINTS:
PILOT PROJECT FOR SAFE TRUCK CHECKS

The Federal Office for Goods Transport (German: BAG) is making an important contribution to traffic safety, environmental protection and tax collection by onducting 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 use or this purpose. This not only requires a high number of staff, but also represents a serious safety risk. Automating the process can reduce personnel and, above all, ensure safer working conditions for those involved.

AUTOMATED SYSTEM WITH NUMBER PLATE RECOGNITION (ANPR), SOFTWARE AND PROGRAMMABLE vMs

The BAG pilot systems are being implemented in 5 lots at different times. With one check-point on each of the Federal motorways, the A1 (Schleswig Holstein). A2 (North Rhine-Westphalia) A3 (Hesse), A9 (Bavaria) and A10 (Brandenburg). At four locations ahead of the checkpoints, ANPR camera 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 transmitted to the intelligent outstation on the parking lot of the BAG checkpoints using wireless technology fiber optic cables. This informatio is forwarded by W-LAN to the BAG employee's laptop and displayed in the browser-based software

The software helps the BA mployee to select the vehicle that as to be diverted for inspection - in advance and at a safe distance. The
corresponding license plate number wil automatically be transmitted to the freel programmable LED sign, prompting the driver to exit to the checkpoint. As well as prompting individual vehicles, othe vehicle types such as trucks, buses or cars with trailers can also be requested to exit. Another video camera at the LED sign monitors the procedure.

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.

## Carmel Tunnels Haifa <br> Israel


swarco traffic manacement - hichway \& tunnel solutions
TUNNEL MANAGEMENT SYSTEM TO RELIEVE DOWNTOWN

SWARCO equipped the Carmel Tunnels of Israel's 3rd largest city with new hardware and software - now travel times are reduced and better safety for road users is ensured.

The old part of Haifa with port and major business districts is located on a narrow strip beneath the 550 m high Mount Carmel. To relieve traffic-congested downtown Haifa and to provide an alternative to driving up and across Mount Carmel and so the Carmel Tunnels Project was started. SWARCO acted, together with Partner Menorah Izu Aharon in Israel, as system integrator and coordinator

PROJECT SCOPE CHALLENGES AND GOALS

The project consists of two sets of twin tunnels, the 3.5 km long western and the 1.6 km long eastern set, with two anes of traffic in each tunnel and four portals. The entire project is 6.5 km long and includes 5 conventional bridges, 6
segmental bridges and 11 km of roads. Using the tunnels, which require a paying toll, cuts the current travel time from the Haifa South interchange in the west to the check post interchange in

CENTRAL SYSTEM FOR CENTRAL MANAGEMENT

The project includes the complete tunnel management system with a central software and 27 outstations. The central

Stware allows control of all tunnel systems by means of a visualization creen. All information is available all re monito frem. The tunnels mon in enter in Krayot. Furthermore, he yem ins (FMS) includin anal lion ( re delection, electrical contro, Igh real fear reacs in case of an alarm ned measures such as tunnel closure.

PROJECT SCOPE. central control software; 27 outstations; 4 internal variable message signs (LED); 73 lane control signs; 4 prism openers for variable routing; 46 double induction loops; 84 traffic detection cameras 8 PTZ cameras: 18 corridor motio detection cameras; 9 routing and blocking barriers: 2 overheight control 144 emergency roadside telephones


## SWarco traflic manacement-Hichwav \& tunne solutions <br> EFFICIENCY UPDATE FOR ONE OF THE LONGEST ROAD TUNNELS IN THE ALPS

SWARCO equipped the Gotthard road tunnel (motorway A2) with new hardwar and software - efficiency increased with EffiGo integration into the operational management level and a new operating concept are included. The Gotthard Road Junnel in Swiss Alps is one of narrowest arteries on the transit corridor road tunnels with bi-directional traffic. The tunnel traffic control had world's longest renovated between 2003 and 2005 by SWARCO's former subsidiary Weiss-Electronic GmbH in the course of everal prepared for an integration into the operational management level (BLE TINWUR) of the cantons of Tessin (TI), Nidwalden (NW) and Uri (UR) with subsequent BLE network integration of all traffic computers.

OBJECTIVES, CHALLENGES AND TO-DOS

As the operators were very satisfied with the functionalities and reliability of the raffic management system, they chose SWARCO again in 2014 to increase the fficiency by integrating the Gotthard system into the superior BLE. This required the simplification and adaption of the software architecture to cope with
the other devices of the BLE. Further action points: Cancel the separation of the northern ramp so that the separate master computers are no longer needed. Their functionality is then handled by the tunnel master computers, creating a redundancy set-up. Moreover the outdated computer hardware had to of replaced and he enire group leva redundant KRI2B.

NNOVATIVE AND RELIABLE MMI SOLUTION

The heart of the traffic control system was not modified since it had been working fine. However, there was mprovement potential for the user terface. The original one was developed with Java applets, which vere no longer viable due to the number of possible different versions. Therefore
a completely new MMI (Man Machine Interface) was developed, exclusively based on HTML and Java Script and adapted to the "Look and Feel" of the other BLE components. Moreover the following hardware was installed within the project: 2 master computer systems incl. web server, 2 emergenc computer systems incl. web server, 10 substations to control some 500 traffic guidance system components

SERVICES Design, supply, installation, commissioning, maintenance

TECHNOLOGY PRIMOS® road station TLS 2012, traffic guidance panels (prism and LED)

PROJECT DURATION
2014-2016

\& TUNNEL SOLUTIONS
A 99 MUNICH RINGROAD
SMOOTHLY RUNNING MOTORWAY TRAFFIC
The A99 motorway, also known as the Munich motorway ring, is Bavaria's busiest motorway. To prevent traffic from coming to a standstill during the expansion, SWARCO was commissioned to carry out the adaption of the traffic contro faciities. An average of Ismaning junction and, at the same time, to adapt signposts, sections with flexible release of the hard shou and, al he same prepare and re-use traffic system components wherever possible and to maintain the hard shoulder use during road construction and facility conversion works.

A ROUND-UP OF THE SWARCO SOLUTION

The affected section of the motorway guidance system comprised of a bidirectional carriageway, each with three lanes, and the hard shoulder, which was also used during the construction work for temporary release during peak traffic hours. In the course of the work, the overhead signs of the Aschheim//smanin junction were dismantled and rebuilt in line with the relocated junction. The gantries were also adapted to the changed requirements. The release runs for use of
the hard shoulder also had to be adapted to the new location in cooperation with the traffic computer center. In addition, the video cross-sections were also adapted the changed locations and visibility conditions.

OUR SCOPE OF WORK

1. Dismantling, building and necessary interim storage, efurbishment and re-installation of: 10 new gantries, 2 refurbished cantilevers, over-head routing signs (refurbished) new overhead routing sign, 28 new
variable message signs in LED technology 4 traffic rerouting panels (rotating prism and LED technology), 8 video camera (refurbished)
2. Delivery and installation of: 11 new outstation in line with TLS 2012. 11 control cabinets
3. Installation of all set-up devices

Thanks to SWARCO's solution traffic was largely running smoothly, taking away stress from the motorists and reducing costs for our customer

[^0]suppliers; Adaption of the look and feel of the visualization in line with customer wish. The system fulfils the highest data security standards. SWARCO replaced an existing SCADA system with its object-orientated system handiling and controling operations installations, emergency systems such as fire alarm, fire-fighing wate supply, emergency call escape route identification, communication equipmet
such as tunnel radio, loudspeakers videosystem as well as general operating devices such as lighting, ventilation, de-watering, energy supply, building technology, IT communication with network and router. The integratio of the sub-systems was done by mans ibily war to point poith server, an interface application to
meras, and emergency telephones The application can be easily expanded through plug-ins (clients), whereas eac lug-in represents the connection of an interface. In Bielefeld the existing acility was replaced in several stages, till allowing the operation via the Id system and the new SWARC nology. This was very helpful asting in making the etting used to the new situation.

The old operating technology was finally switched off in December 2017 when the new control computer of the firebrigade's coordination center was up and running. SWARCO PRIMOS® UNEL CONTROL is considered as an innovative milestone and importan tencion group portfolio raffic control and aperation contrin rinct a single system.


No matter how our vehicles will be powered in the future, the car will remain a form of personal transportation that offers its owner the freedom to travel when and where they want, in a way that public transport finds it almost impossible to rival. While in the future cars may be shared and able to carry out quite
complex tasks autonomously, they will still need to be stored safely.

We at SWARCO understand parking management as the implementation of different policies, programs and strategies, which result in a more efficient use of scarce parking resources. SWARCO's integrated parking solutions give car park service providers the tools to protect parking assets, manage traffic flows, support modal shift policy with dynamic tariffing and retailers with extensive discount scheme.

Like you, we're passionate about electric vehicles and understand the importance of reliable, easy to use chargers and systems. Smart charging is as much about people as it is about our charging solutions. We provide simplicity - simple answers to sometimes complex questions, charging solutions that are easy to install and use. We are a partner who does what they say, and are in it for the long term.

## PARKING \& SMART CHARGING SOLUTION

THE CHALLENGE Create a modern parking guidance system for efficient use of existing parking spaces SERVICES Planning and execution

TECHNOLOGY 29 dynamic LED parking guidance signs, VMS at 5 different locations special announcements, data transmission via GPRS, no on-site omputer necessary due to SWARCO solution with virtual parking guidance by software as a service
PROJECT DURATION April - September 2014

sWarco parking solutions
THE EASE OF PARKING
A CASE FOR SOFTWARE AS A SERVICE

Bergisch Gladbach - not only is the city itself is highly worth seeing, but also the new parking quidance system from SWARCO. Thanks to variable message signs, the search for a parking space is very clear and simple.
"Welcome to Bergisch Gladbach" is displayed in yellow text on the LED display as you drive into the pretty district town about 10 km from Cologne. The variable hessage signage is part of SWARCO's modern parking guidance system - with the aim of making better and more efficient use of existing parking facilities.

DYNAMIC AND
UP-TO-DATE INFORMATION

The new dynamic parking guidance system from SWARCO integrates 8 parking facilities. A special feature is the public car park "Schnabelsmühle", in which entering and exiting vehicles are
recorded with video technology. total of 29 VMS permanently show he current status of available parking spaces. These VMS also include 5 variants with two-line information on
the display. Here you can also get information about local events, news and much more.


## THE CHALLENGE

Providing a turnkey PGS that reduces parking search traffic and at the same time provides traffic information and guidance, data transfer from 14 parking facilities

SERVICES
Complete project planning and execution, delivery of a turnkey system

PARKING GUIDANCE SYSTEM
FOR GERMANY'S FORMER
CAPITAL

The federal city of Bonn is one of the twenty largest cities in Germany with a population of approximately 330,000 . As the main center of the Rhineland metropolitan region and an important center of science, Bonn faces a high volume intensifies the traffic situation, especially on the three bridges crossing the Rhine The hens city of Bonn was the moly educe parking search traffic, but also provide traffic information and guidance.

REAL-TIME OVERVIEW

To be able to react flexibly to the traffic situation, SWARCO installed a system which includes 32 full-graphic, fullcolor LED matrix displays (dynamic parking guidance signs) to provide real time overview of the parking situation In addition to displaying the current parking situalo, hese displays offer maximum flexibility and are i.e., also used to indicate trafic incidents, the environmental stiuation or rescue poren by 18 static parking complemented by 18 static parking city center area.

FLEXIBLE TRAFFIC CONTROL

The parking guidance computer is mplemented as a virtual server in the data center of the city of Bonn and has interfaces to the traffic control computer, the Bonn fire department control computer as well as to the servers of the parking garage operators. The software is based on the prove ParkLine web software with a fully raphical, intuitive web interface. A additional module for flexible traffic anagement has been integrated in he form of a scenario manager Adding the infor stion from the parking idane guidance system, the interface also
displays the traffic situation in real time. Using the interfaces to the servers of the parking garage operators in Bonn, the PGS additionally gathers the occupancy data from all parking garages in Bonn city center, district Beuel and the parking garages of World Conference Center Bonn.

THE CHALLENGE implement a powerful $\mathrm{E} V$-charging system without the need to upgrade the the renewable energy available on site,

SERVICES
Instalation and commissioning of a booster. Remote monitoring, regular service, and maintenance of the equipment.

TECHNOLOGY
Charging station consisting of one battery booster pack of 140 kWh capacity no
 atery booster is connected to the grid SO WNAC. The Ithium-ion batteries dnarging cables are liquid cooled to guarantee a consistent peak performance of the equipment for many years.
sWARCO MyCharge Control as a lechnical backend for monitoring the devices and offering a world class service in case of any problems concerning the charger.
PROJECT DURATION 2022 and ongoing services




CAR SERVICE
AND GAS STATION

Bernd Goldhammer GmbH is a long-established car service provider and car deale near Cuxhaven, at the North Sea coast of Germany. The company provides a gas tation for fossil fuels and offers repairs and car servicing with partnering to the Ford will drive an harging infrastructure to make the transition to clean energy and revitalize his urs. Oite Goldhammer has some storities a da hich have been , No, lot wis. the North Sea, a lot of wind energy is available at the site.

The customer needed a powerful EVcharging system to charge one or two cars at an output of about 270 kW DC without the need to upgrade the grid or ransomers. The system should use re if ne pane on site and, if necess powered generator
higho provided the customer with aigh-performance charging system he intala).
high-performance charger with up to 270 kW DC. SWARCO now provides egular service and maintenance the equipment as well as a remo monitoring service via SWARCO MyCharge Control (CPO) to keep this ophisticated product up and running later upgrade to payment services kely once the offering is establish The project was fostered by funding om the regional government of Lower Saxony.


SWARCO SMART CHARGING SOLUTIONS
PROGRESSIVE E-MOBILITY
INFRASTRUCTURE FOR
HAGEMEISTER GMBH \& CO. KG

With around 200 employees, the brick-producer Hagemeister enables better living and working environments for all people. Hagemeister manufactures façade bricks, pavers and oll products.

The main task in this project was to implement the ever-growing desire for clean mobility at Hagemeister. Not only customers and guests of the permanent exhibition, but also the employees and a use the Hagemeister pharging tations use the Hagemeister charging stations Different billing methods and means payment are to be implemented. SWARCO provided Hagemeister with Control" for the Control form control of the charging infrastructure
on site. For easy billing and payment of charging services, SWARCO also provided the SWARCO EMP backend
"MyCharge Pay". With the backend "MyCharge Pay". With the backend, billing can take place with or without a customer account and Hagemeister billing processes.

Hagemeister will further expand the solution at the Nottuln site after the positive experience with the first devices.

THE CHALLENGE Design and implementation of a modern parking guidance system for a large automobile manufacturer including civil works and cabling

TECHNOLOGY Parking guidance central computer, data collection at 6 parking facilities by means of energy-autonomous ParkHere sensors, data processing of single-space monitoring equipment, 7 dynamic parking guidance boards

PROJECT DURATION 2017
swarco parking solutions
DYNAMIC PARKING GUIDANCE better orientation for porsche employees

Dr.-Ing.h.c. F. Porsche AG operates its development centre in Weissach, 30 km west of Stuttgart, with around 6,500 employees. There is an ongoing search for parking spaces by employees in the company's own parking garages and parking lots, particularly at search traffic and stress in the morning. SWARCO successfully implemented more than search tranc and stess she morning. SWARCO successuly mplemented more lian existing systems with signage and computer upgrades and numerous extensions fell to the experienced team based in Gaggenau near Karlsruhe.

BETTER ORIENTATION FOR THE EMPLOYEES

Sports car manufacturer, Porsche AG is a prominent customer who ordered dynamic parking guidance systems for their development center in Weissach and the headquarters in Zurfennausen. The expansion of the main factory also led to a nirceased need or parkng spaces. 1 n equiped with eleven dynamic parking equipped win ever dyamio paring about the current occupancy. Meanwhile a second construction phase started, puting up sign in the city are of pung up signs in the city area of Stuttgar stage which road to take to the next free
parking house in Zuffenhausen.
A COMPLETE PACKAGE
In Weissach seven sign posts indicate the availability of free parking spaces. This is either assessed by counting the ference between cars entering and ca system SWARCO yytem. SWARco was responsible for neinering wark, pretuction nge ing work, prodision the ew, extended requirement for parkin ida sys. guidance systems such as centre (Software as a Service)

Integration of parking spaces with charging stations for e-vehicles Parking space reservation option before starting the trip - Personner number related single space monitoring for employees - Integration of single space citywide parking of car parks in citywide parking guidance system - Communication of car internet and as smarthone Integration surphone app Integration of full malix - Control of bollards to - Control of bollards to restrict parking spaces and sensitive city areas transport and park \& ride facilities.

## countries.

From Vienna to Oslo, from Dubai to Sydney, from Cape Town to São Paulo: SWARCO products systems and services keep traffic in motion in over 80 countries around the world.

oercent. LED light sources in consume up to 95 consume up to 95 percent less energy candescent bulbs, thus reducing CO2 emissions and saving operating costs.

## NUMBERS SPEAK LOUDER THAN WORDS.

Facts and figures from the world of SWARCO.

## 1,000,000,000€

In 2021, SWARCO's M\&A activities laid the foundations
for a major leap in net sales. The group turnover is
about to pass the $1 \mathrm{bn} €$ threshold soon.

## $1.001,850$ ander

Our annual road marking materials production suffices to equip over a million kilometers of roads, which is equivalent to a journey 25 times around the globe. And this number keeps growing every year.

century.
Our ristory began in 1969 wilh the production of reflective glass beads. Half a century later,
SWARCO is among the world leaders in road marking and intelligent traffic management.


[^0]:    SWARCO TRAFFIC MANAGEMENT - HIGHWAY \& TUNNEL SOLUTIONS

    TOP LEVEL TUNNEL CONTROL FOR BIELEFELD

    Premiered in the „Ostwestfalentunnel" in Bielefeld, North-Rhine Westfalia, operations control and traffic control were combined on a redundant computer system. When developing the PRIMOS® TUNNEL CONTROL system, SWARCO took care of the following requirements: Browser-independent web visualization and international anguage selection; Tailor-made customized solutions with scalable modular system architecture and open interfaces and SPS solutions independent of the supplier; Easy integration of objects by text-based description of logical process chains, i.e. no binary content or cryptic abbreviations; High degree of availability by failo systems and redundancy (hot standby); No dependency on licenses from other

