ITS International

WORLD HIGHWAYS

PORTABLE VIGIE MOBILE CAPTURES EVERYTHING

French engineering firm Parifex has developed a selection of non-intrusive roadside control tools to meet the needs of road and traffic authorities around the world.

The company's innovative Vigie Mobile is a portable solution that combines the most advanced sensor and image capture technologies to monitor multiple violations at the same time and across up to six lanes. These include red light crossing, speed, lane-related and tailgating violations, and obstacle detection. The system is also able to detect four categories of vehicles (heavy trucks, cars, buses and motorcycles), as well as pedestrians, and it can monitor their speed accordingly.

Based on a 3D lidar sensor, the Vigie Mobile can track vehicles from 100 metres upstream, which ensures high accuracy and reliable measurement, even in difficult measurement conditions such as tailgating, changes of direction, heavy traffic, and more. Combined with its ANPR software, Parifex says the system is also adaptable for many other applications, including smart city, smart parking, traffic management, safety, and access control.

Parifex has been involved with the development of innovative road safety and traffic management solutions, Doppler and/or lidar-based, for more than 30 years.
www.parifex.com

Real-time video-based traffic counting and classifying using AI

IRD is offering a revolutionary new video-based traffic counting and classifying system that uses artificial intelligence (AI). The system is easy to install on existing poles at the roadside. A user connects to the system using a tablet via wi-fi, enters a station description (number of lanes), and reviews the camera position. That is all that is required to start counting. The system easily handles classification over three lanes in a single direction, or four lanes bi-directional at highway speeds.

IRD says its solution can out-perform radar systems when classifying vehicles into six size-based classes and is capable of classifying vehicles based on the standard 13-category FHWA class definitions used in the US. Video performs better than radar at counting traffic in highly congested or stop-and-go conditions.

Data is delivered via reporting software, a real-time

data stream, or in standard spreadsheet formats. Data is verifiable through video review, with each vehicle separately captured and placed in order at the top of the video with the class and lane identified.

The top features of this revolutionary system include no video uploading for third-party processing; high-speed traffic data on three-lane roads; bi-directional traffic data; and safe and simple operation.

Additionally, IRD's new system is a convenient tool for quality control/assurance with saved video and images that provides reliable performance day or night in all weather conditions. **www.irdinc.com**

Wektor shows the way

Poland-headquartered Wektor, a manufacturer of warning equipment for road works, is highlighting a range of LED warning lamps, powered by Li-ion batteries with a charging option.

Wektor, formed in 1993 to specialise in the road sector, says Li-ion batteries offer significant advantages because they are fast charging and have a long life – twice that of gel batteries. The company's units have cell damage protection against full discharge and have no memory effect, meaning that capacity does not decrease. Additionally, the company's Li-ion batteries are ecologically beneficial. Wektor says that batteries with other parameters can be made to order. **www.wektor.sacz.com.pl**

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INNOVATIVE TRAFFIC LIGHT FUNCTIONS FROM SWARCO

Swarco has always taken on the role of pioneer and innovator in the field of traffic signalling. That commitment continues and two recent innovations, PedCom and AirDec, underscore how the company is using intelligence to enable traffic lights to perform important new functions.

Demand-based activation of green times for road users (push buttons for pedestrians, cameras/loop sensors for vehicles) has been part of road traffic for years. Swarco plans to go one step further with PedCom. An infrared-based sensor unit in traffic light signals will detect objects, and especially pedestrians, both in the waiting area and on pedestrian crossings and, if necessary, extend the green time. This will help wheelchair users and those using walking aids to cross the road. PedCom will benefit vehicles since empty crossings would mean that traffic can proceed, optimising traffic flows and reducing pollution and emissions.

Swarco plans to use the same technology in traffic lights to detect and count vehicles.

Air quality is an important indicator of the quality of life of the inhabitants of cities and towns. Traffic, especially stationary or slow-moving vehicles, can negatively impact air quality. Monitoring and gathering air quality data are of vital importance for generating an overall view on the status of a city. Swarco has developed AirDec a modular environmental station for measuring air quality integrated into the traffic light. This should make it possible to establish a measurement network for relative monitoring of the air quality of a community. Long-term monitoring could identify hotspots and possibly mitigate them by appropriate traffic, organisational and planning measures.
www.swarco.com

Over the past year, RoadVista's Laserlux G7-Color was used as the primary data collection tool for the Measure Across America Project (MAAP). MAAP is a not-for-profit project focused on promoting the improvement of pavement markings for both human and machine drivers.

The first of its kind, MAAP is a historic, comprehensive pavement marking assessment of over 8,800 kilometres, crossing the United States from the Atlantic Ocean to the Pacific Ocean and back. The results are a collection of millions of data points on the primary characteristics that affect the safe operation of both human and machine-driven vehicles. This data helps traffic engineers, automotive engineers, and government agencies, better understand what makes a good quality road marking for both humans and automated vehicle sensors.

To accurately collect and study these characteristics,

RoadVista and the Measure Across America Project

MAAP utilises the innovative technology of the RoadVista Laserlux G7-Color mobile retroreflectometer adapted to the advanced semi-autonomous Tesla Model X with enhanced auto pilot.

This project provided a comprehensive collection of over 79 million roadway marking scans of retroreflectivity and other visibility contributors such as the markings' colour, contrast, QD, size, width, consistency, material types, pavement type and more. Additionally, this study included data representing the interactions and confidence levels between the markings and the vehicle's automated systems, identifying where, when and why the most common navigation interruptions occur.
**www.roadvista.com**

RTMS Echo unlocks powerful data

As the Covid-19 virus continues to impact many communities around the world, the number of roadways users has drastically declined. Transportation agencies need real-time data to understand how the pandemic is impacting their communities.

In the last four weeks, the 401 highway in the Toronto metropolitan area, has seen a 46 per cent decrease in vehicle traffic. However, while the number of cars on the road has declined, truck traffic has remained the same, at about 14,000 per day. This useful data shows that goods and supplies are still being transported while communities are continuing to do their part to stop the spread of the Covid-19 virus.

As the world continues to evolve and change, traffic engineers need reliable, accurate real-time data to understand the impact of these
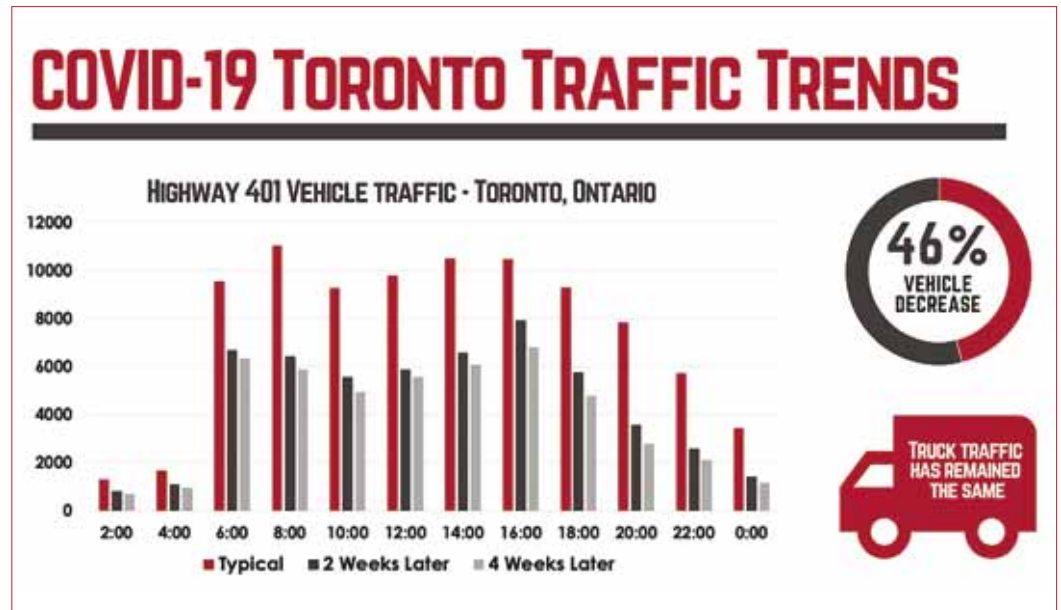
events on their community. Image Sensing Systems says its RTMS Echo gives transportation agencies the tools to extract more value from traffic data, increasing the value of the investment. The per-vehicle detection

capabilities of the Echo retains the high-resolution data as the vehicle passes the sensor. The traffic data retrieval engine in the Echo gives agencies the flexibility to convert the stored vehicle records into a custom traffic data feed. As

traffic professionals continue to develop new techniques to manage roadways, Image Sensing Systems says the Echo will be a tool that will continue to support these techniques with the necessary data.
www.imagesensing.com

AWARD-WINNING PRODUCTS FROM HOUSTON RADAR

US-based Houston Radar, a leading supplier of Doppler and FMCW radars for the traffic industry with customers in over 50 countries, is highlighting three major product innovations – SpeedLane Pro, Tetryon traffic cloud server, Armadillo Tracker and the Armadillo Crossfire.

The SpeedLane is an award winner - it won the Intertraffic Innovation Award in the Traffic Management Category in 2016. That device has now

been superseded by the even more advanced SpeedLane Pro, an industry-leading true dual-beam, ultra-low power side-fire radar. It is designed to accurately detect lane, speed, and class of individual vehicles and compute per lane volume, occupancy, gap, average speed, 85th percentile and headway parameters in up to 16 lanes on the road in all weather conditions.

The SpeedLane Pro is

complemented by Houston Radar's Tetryon traffic server; a customisable cloud server used to aggregate data from multiple SpeedLane Pro and Armadillo units in one central location. The products are designed to seamlessly integrate out of the box to enable rapid deployment of customers' traffic data on the web.

The Armadillo Tracker, a highly portable, fully integrated multi-lane bi-directional traffic

statistics gathering device, is a leading non-intrusive collector used around the world that is designed to replace road tubes. It is also the smallest and most convenient radar-based stats collection box. The device collects individual time-stamped vehicle counts, speeds and class per direction in up to two adjacent lanes, making it a perfect fit for traffic monitoring and speed study applications.
www.houston-radar.com

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TRL HARNESSES THE POWER OF ROAD TRAFFIC CRASH DATA

During its latest webinar series, TRL Software discussed its most advanced version of crash database software: iMAAP. This innovative new software solution is a complete tool for the management, analysis and evaluation of road traffic crash data.

After a compelling comparison between the current pandemic and the situation faced in road safety by TRL's John Fletcher, attendees were given an exclusive tour of iMAAP, and it's a fully web-based system capable of handling a wide range of user data and GIS formats. iMAAP is specifically designed to have the capability to link to a range of external databases holding data such as vehicle licence information, driver registration details and medical information on casualties, all of which can be used to augment the police report information, allowing more complex analyses.

In line with the original MAAP ethos, iMAAP is extremely user friendly, meaning users can be working with the product effectively after relatively little training. It is also designed to enable and encourage the wider sharing of crash data amongst a variety of stakeholders. As TRL's Sanjay Vadgama points out, data is key in the fight towards Vision Zero, the more data we have, the greater power.

Available on any connected device, iMAAP is a fully responsive cloud-based solution underpinned by decades of TRL research and development. It forms an integral part of TRL's suite of transport solutions. A key emphasis is on making data collection and analysis as easy as is possible with a focus on collaborative working across departments and multi-organisational partnerships.

www.trl.co.uk
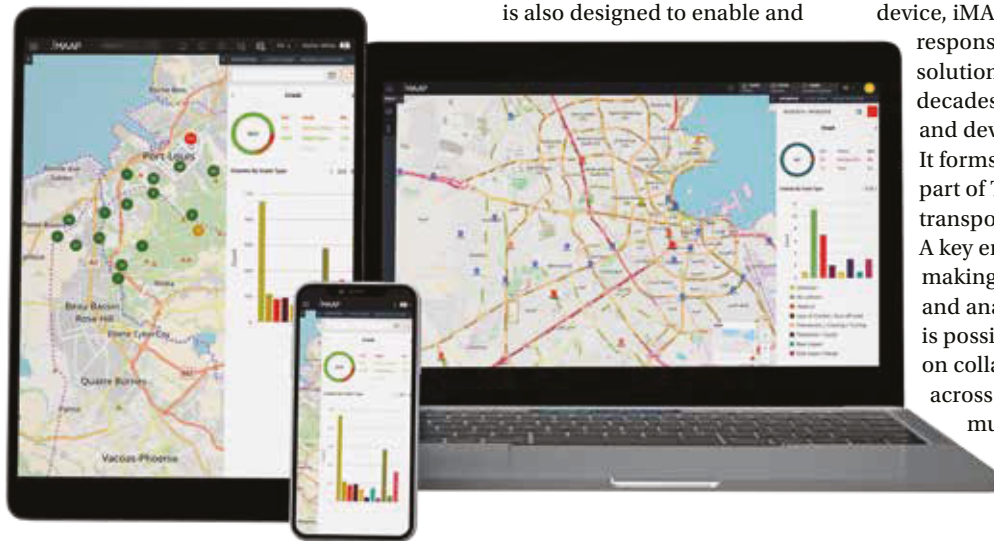
A versatile solution for detail striping

Agile and compact, MRL Equipment's self-propelled Mini Mac product line is a versatile solution for detail striping. Its highly manoeuvrable design and easy, one-man operation makes short work of intersections, crosswalks, and lane markings.

The Mini Mac is also perfect for road marking applications in congested, urban areas and limited work zones. With 400 lb/181 kg capacity material tank and 100 lb/45 kg bead capacity, this increased material capacity yields two- to three-times the production of a handliner – and prevents operator fatigue versus push-propelled applicators. The Mini Mac is designed with the operator in mind, with on-board controls that are intuitive for speedy training and ease of operation.

With many options available, customers can customise the Mini Mac to get the best equipment for their projects. Options include electronic skipline timing system; laser guidance; double drop beads; customer "easy load" transport trailers; and many more. Standard unit colours are lime squeeze green, traffic orange, safety white, or signal yellow. Buyers can also customise their unit with their own custom powder-coated colour at no extra charge. Units are available in both right- and left-hand drive models and with multiple die configurations.

www.markritelines.com

Road User Charging: Efficient Methods to solve Transport Challenges of the Future

Increasing demand for mobility worldwide poses unprecedented challenges to the responsible authorities. **Sascha Ruja**, business development director for Road User Charging at Jenoptik Light & Safety, explains how these challenges in transport, like congestion and air pollution, can be managed efficiently using the latest ANPR technology

Economic growth and increasing demand for road traffic over many decades have led governments and public authorities at national, state, regional, and local levels worldwide to introduce different transport policy measures. These can be building new or upgrading existing roads to provide additional capacity; discouraging travel demand on congested roads; implementing permit systems to reduce access to designated areas; imposing parking restrictions; or placing bans on commercial vehicles during certain hours. However, the lack of required investments for building, operating, and maintaining road infrastructure and persistently high levels of road traffic in urban areas is still a major problem for many public authorities, road agencies and road users.

Infrastructure funding gap

To keep up with the projected economic growth, the global average annual investment need in road infrastructure over the period from 2017 to 2035 is estimated to be approximately US$0.9 trillion, according to McKinsey & Company (2017). However, spending has been less than required in the past, and if those rates are kept, countries around the world will deal with an increasing gap. Apart from the lack of funding for road infrastructure, the travel demand for both goods and passengers has increased worldwide and is expected to continue to rise. It is thus evident that the road transport sector is, to a large extent, accountable not only for congestion but also for greenhouse emissions and air pollution. While congestion imposes a significant cost because of delays and uncertainty for individual road users, the associated air pollution is a major cause of disease and death, according to the World Health Organization (2019).

Imposing a charge for road usage has become a popular policy measure to tackle these problems, and the number of roads being charged or tolled has consequently increased significantly over the last decades. Furthermore, in the next few years, more than half a billion people are likely to pay for road usage, which underlines the need for respective charging systems.

Nowadays, there are three objectives that political leaders consider when introducing a charge for road usage. These objectives are mainly related to raising revenue for funding transport investment; operation and maintenance costs, reducing traffic demand in congested areas and other harmful external environmental impacts (air and noise pollution), or a combination of all three. To achieve them, policymakers, transportation planners, and toll chargers must carefully consider the properties of road charging design – the method, the level, the location of charging, and the type of technology and its cost of operating.

Experience from real-world applications indicates that road charging is not applied uniformly. For example, a charge for accessing the central business district is applied in Singapore as well as a few European cities. In contrast, some cities in the US levy a charge for entering dedicated express lanes. In some European countries, heavy goods vehicles are charged per distance driven on motorways, while other countries use a time-based electronic vignette system. Moreover, road charging schemes vary in terms of tariff levels, geographic scale, and vehicle parameters.

The role of technology

In 1959, Canadian-born professor of economics and Nobel Laureate William Vickrey first advocated the idea of using electronic technology as a method of implementing a congestion charge when he testified to a US congress committee. His testimony likely influenced other transportation authorities.

▶

Since the beginning of electronic toll collection in the late 1970s and 1980s, advanced technology was used for cities, highways, bridges and tunnels to generate revenue and manage traffic congestion. New technology enabled road charging operators to apply different types of charge (facility-, distance-, cordon-, zone- and time-based). The industry and practitioners argue, though, that the type of technology has a major implication on the economic appraisal of a charging scheme.

In today's systems, dedicated short-range communication (DSRC) and radio frequency identification (RFID) is still valued by road charging operators, although high investments in roadside infrastructure are required. However, the use of these technologies for large, area-wide (national) schemes does not seem to be economically efficient. Therefore, charging systems that rely on a global navigation satellite system (GNSS) have been deployed.

Given the variety of existing technologies, it is in the interests of the road charging authority to select the system that simultaneously fulfils their policy objective and bears the lowest cost to build, operate, and maintain. Studies reveal that, economically, the optimal technology choice depends on key criteria such as the length of the road network, the number of road users, and the performance and cost structure of the technology.

Benefits of cost-efficient ANPR technology

Automatic number plate recognition (ANPR) has been the primary technology for enforcement, given lower performance rates compared with technologies such as DSRC, RFID and GNSS. However, new developments in machine learning and licence plate recognition are closing the performance gap, and ANPR is increasingly being used as a viable and cost-efficient alternative for charging in future.

Jenoptik provides highly efficient ANPR technology, including smart picture processing with sensor fusion, comprising video capture and axle-based classification. This technology ensures maximum revenue collection for road usage, based on highly reliable and accurate capture rates and low total cost of ownership.

Originally developed to provide an effective, constant, cost-efficient, technology-based counter to terrorist activity, ANPR has since been developed for a whole range of applications. Civil applications for traffic management purposes include the gathering of origin-destination and journey time data, which enables more effective network operations. Measuring distance over time also facilitates safety applications such as average speed enforcement.

One great benefit of ANPR is that the technology can be used very efficiently for various types of combinations of safety, security and road user charging applications. In many cases, these applications are tightly interwoven and mutually supporting.

The ANPR technology itself is underpinned by the acquisition and interpretation of large amounts of information. In many respects, this is in line with current Big Data and smart city trends. A crucial part of all this is pattern recognition – specifically, monitoring vehicles' individual and collective progress through the capture of number plate images. A key differentiator for Jenoptik's ANPR technology is its sophisticated and highly featured back-office solution with real-time analytics.

ANPR will play an ever-increasing role in the road user charging market. That's because it is a versatile and flexible technology that can exactly be fitted to meet all sorts of specific requirements. Not only that, but it also ensures maximum revenue collection for road usage based on low total cost of ownership. Thereby it can help very effectively to master the challenges of future mobility ■

www.jenoptik.com

Sascha Ruja joined Jenoptik Light & Safety in October 2019 as business development director for road user charging (RUC). He is leading the company's business activities in the areas of RUC, tolling, clean air, emissions and congestion monitoring. He holds a doctoral degree in business administration with a focus on road pricing, from the University of Hamburg, and has held senior positions with Siemens, Nokia and Q-Free.

Carlo van de Weijer   Aurelien Cottet   Paul Speirs   Chris de Veer

Intertraffic – changing modes

Insight is foremost when the world is turned upside down - Team Intertraffic reports on the first Intertraffic webinar

The day that should have heralded the start of 2020's Intertraffic Amsterdam, with our iconic RAI venue welcoming around 35,000 visitors, was a poignant time to host our first Intertraffic webinar. Our mission "Speeding up the mobility transition" was timely with about 1,500 people from 98 countries registering to hear three top-level speakers' collective and individual wisdom in these challenging times.

Moderator Carlo van de Weijer, director of Eindhoven University's smart mobility research department and Intertraffic Supervisory Board member, posed a pertinent question: has Covid-19 changed the face of mobility forever? Has it altered our travel behaviour permanently? Working at home, he suggested, is set to become the new normal but if traffic levels remain lower in the immediate aftermath of the lifting of lockdown restrictions will this mean there's more space for personal modes of mobility? The coronavirus, it would seem, is "speeding up the mobility transition" in ways deemed impossible only a short time ago.

Mass initiatives

Opening speaker Aurelien Cottet, MaaS Initiatives Coordinator at Transdev, provided thought-provoking insights into the latest MaaS developments and what effects Covid-19 might have on MaaS and public transport (PT). Cottet explained that overcoming an initial reluctance from some subscribers to pay for mobility subscriptions using smartphones could well be an unexpected by-product of the pandemic, as handling cash becomes less desirable. This ties in with current concerns across Europe over using public transport. PT ridership, and shared mobility options, have plummeted dramatically over the last six weeks.

Make transit demand-driven

"Who has touched my shared bike? Who has sneezed in this taxi? Or touched the door handles?" Cottet wondered. Confidence will be restored by reducing mass transit capacity. But who is going to pay for buses to be redesigned or trams to be repurposed to allow social distancing? By making transit demand-driven and, perhaps, using smaller buses more frequently.

Homeworking was never far from the agenda and Cottet suggested employers could stagger office times to ensure employees' safety. "Some work from the office from 11 till 3, others 1 till 5 with remaining hours worked at home. This would flatten the curve of employees returning to the workplace." An attendee asked about the potential rise in private car traffic if PT patrons take some convincing to return. Other than widescale decontamination of PT vehicles and stations, what else can be done to ensure congestion levels are not damaging when lockdowns are even partially lifted? Cottet believes it will take 12- 18 months for public trust in transit modes to return, so he suggests this is where MaaS can come into its own and offer both public and private modes on the same platform.

Paul Speirs, global head of pre-sales, PTV Group, believes the key to successful re-emerging 'into the sunlight' is to understand human behavioural characteristics. Explaining what PTV's analytical software has been noticing in its data since the Covid-19 outbreak, Speirs used some eye-catching graphics to demonstrate recent traffic patterns in Germany. Comparing Easter Sunday 2019 road traffic with Easter Sunday 2020, there was a notable 78 per cent drop in journeys – testament to the vast majority complying with the regulations and in Gorlitz on the Polish border international crossings dropped by 92 per cent. So what can be learned from these statistics?

Has our behaviour changed permanently?

"We've perhaps taken mobility for granted," he said. "We want to get back to what we had before, but has our behaviour changed permanently? Are there new behaviours we can lock in for good? In a recent survey 50 per cent of respondents said that having altered their diet, their attitude to homeworking and travel behaviour, they will not go back to their old ways." This, says Speirs, is an opportunity to lock in those positive alterations.

Our final speaker was Chris de Veer, Strategic Advisor Smart Mobility for the Province of Noord-Holland/Amsterdam Metropolitan Area. "Covid-19 has made two modes of transport suffer: public transit, as it can't accommodate social distancing, and shared mobility, as passengers no longer trust levels of cleanliness.

"We need to focus on sustainable transport and reduce peak congestion by continuing to work from home, where possible," he said.

Noord-Holland's population of just under three million will be encouraged to work from home, even after restrictions are lifted and de Veer sees this as the "perfect opportunity to influence it." National governments have a part to play by increasing broadband capabilities across Europe, enabling more people to work from home and ensuring those wishing to be mobile have a greater choice of safe and clean transit modes.

This first Intertraffic webinar was hailed a success with a lot of knowledge exchanged and many questions put to the speakers, a clear indication that sharing insight is foremost when the world is turned upside down.

This Intertraffic event kicks off a series of monthly webinars, with the next one scheduled for the end of May. Stay tuned via Intertraffic.com ∎

# Blockchain technology for better, safer, smarter cities

Gianni Minetti, CEO of Paradox Engineering, has more than 25 years of business experience in information and telecommunication systems, with particular interests in the Internet of Things, smart technologies, blockchain and cryptography. Here he explains what blockchain is, how it works, how secure it is, and the enormous benefits for smart cities

Today, about 56 per cent of the world's population lives in urban areas, and we know this is expected to increase to 70 per cent by 2050. Wise and far-sighted management of urban resources is more and more needed, especially in low-income and lower-middle-income countries where the pace of urbanisation is projected to be the fastest. Lots of cities are leveraging smart technologies to tackle the increasing demand for energy, infrastructure, affordable housing, well-connected mobility systems, jobs, and overall quality of life.

Smart technologies also play a powerful role in the Covid-19 pandemic, both for supporting crisis response and enhancing urban resilience. A widespread and robust network infrastructure has proven to be vital for remote healthcare and patient assistance, smart working and schooling programmes, and even to support e-commerce for people to buy food and other essential goods to be delivered at home.

New applications based on Internet of Things (IoT) sensor networks have been tested and quickly implemented in some cities to enable accurate traffic control (for instance mapping peoples movements in quarantined districts, in some cases taking advantage of unmanned aerial vehicles), or the intelligent management of solid waste, with specific attention to medical waste. Sensor-equipped robots are being used in some malls for shelf restocking or customer in-store service, and in selected areas for automated street disinfection.

Beyond the pandemic or any other extraordinary occurrence, smart technologies can contribute to more secure, transparent, efficient and resilient communities. At Paradox Engineering, we firmly believe that urban innovation should be based on interoperability and open data models: when a city endorses an open approach, devices and applications can be connected in a seamlessly integrated way – and increase their collective power.
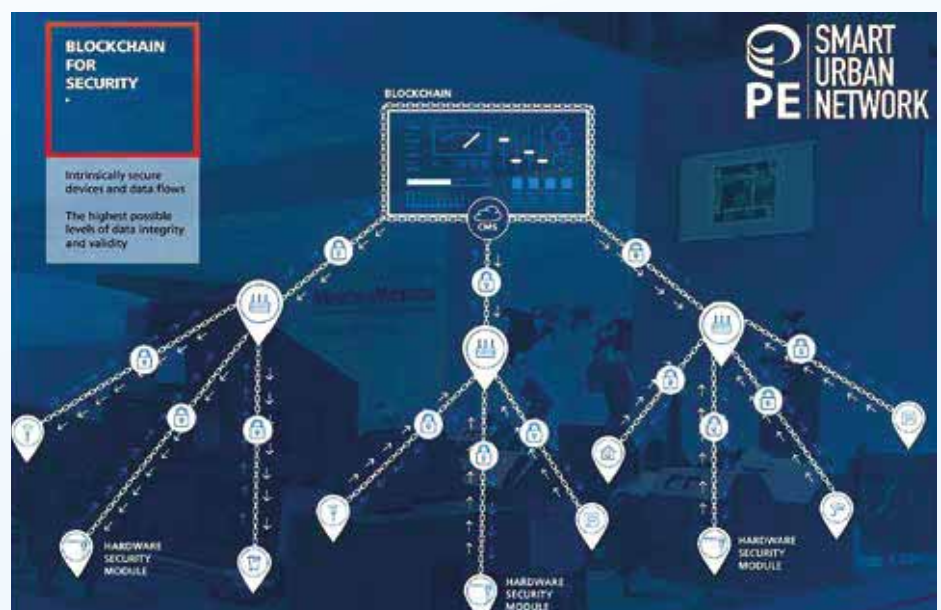
Data can be smoothly exchanged at any level of the urban infrastructure. It can be correlated, for instance, to mitigate traffic congestion through better synchronised public transport or smarter management of car parks, facilitate emergency support and law enforcement through brightened street lighting in case a road accident happens or if a crime is committed.

Also, interoperability means having one single network to host and control multiple city services, with less complexity and costs, and massive benefits in terms of effectiveness and scalability. And what if blockchain comes into play?

About blockchain

We tend to think of blockchain as a new technology, but it was actually a theory put forward way back in 1991 by Stuart Haber and W Scott Stornetta. They first described a digital hierarchy system called "block chain" to order a series of transactions through digital timestamps. In 2008, blockchain, as we think of it today, was conceptualised by Satoshi Nakamoto and implemented the following year as a core component of the cryptocurrency bitcoin.

Simply put, blockchain allows individuals and organisations to make instantaneous, secure transactions over a distributed network. Different from the Internet, where information is transferred by duplication, blockchain allows a share in ownership only. It is a new combination of mature technological concepts, including peer-to-peer networks, distributed consensus algorithms, validity rules, ledger technologies and cryptography, and it can be successfully applied in any domain where relations are based on trust and may be entirely disintermediated, the process of removing the middleman or intermediary from future transactions.

This is particularly useful for cities. Let's picture a city as a smart network of connected objects - to name just a few, think of streetlights, meters, parking lots, waste bins, Wi-Fi hotspots, and video surveillance cameras: blockchain allows all these devices ▶

▶ to be linked to each other by the same cryptographic chain of trust and enable accurate, secure, immutable information exchanges among them. These exchanges are essential to delivering any kind of service to people and businesses, from public lighting to transportation, from solid waste collection to emergency response support, and more.

Blockchain-powered applications

Which urban applications can benefit from the injection of blockchain? In the energy distribution sector, for instance, blockchain-based metering solutions can accelerate the adoption of real-time differential pricing models and encourage users to participate in power generation by connecting their renewable energy microgrids to the main grid. In water networks, blockchain technologies enable smart contracts and validated rules to automate water supply in the most possible efficient manner, minimising leakages and tampering.

Blockchain can be combined with IoT solutions to provide better waste collection services, as it provides the ability to accurately track waste input and optimise waste truck routes upon parameters including bin status and filling levels. This increases service quality and efficiency and generates further savings on fuel expenses and overall maintenance costs. Garbage-related data could also support the introduction of customised fees for household and commercial users, thus rewarding recycling and correct waste separation.

For public government and administration, blockchain can be used to automate and digitalise civil registries, as well as property, real estate and business registries, generating notable cost savings and increased quality of service. Looking at citizen participation, blockchain-based voting platforms can improve present, analogue electoral systems by achieving secure, anonymous and unique voting in a decentralised manner. The same platforms can be used to poll citizens on specific urban initiatives, making sure contributions from civil society are recognised in city planning and development.

But it's not only a matter of smart, innovative applications. There are two overarching reasons to endorse blockchain.

Ultimate cybersecurity

We said that urban innovation should be based on interoperability to be genuinely forward-looking. Open infrastructures are sometimes perceived as less than secure, and cybercrime is a risk that no city can overlook any longer.

Granting the highest possible levels of data integrity, validity and immutability, blockchain technology makes commissioning and operational procedures over smart infrastructures intrinsically secure. This means cities can move away from the conventional 'bastion defence' paradigm to benefit from security-by-design network systems, where public services can be safely hosted and managed.

That's a huge step forward in mitigating cities' vulnerabilities, and finally, treat cybersecurity as a public good.

New business streams for cities

In smart cities, all urban devices connected to an IoT network have the capability to receive and transmit data and execute commands, enabling remote monitoring and dynamic, adaptive control functions. Smart lighting is a popular example: by acquiring data from street lamps and correlating them with calendar occurrences, environmental conditions or vehicle transit, we can switch and dim lights exactly where and when required, thereby reducing energy consumption, optimising costs, improving quality of service and boosting citizen satisfaction.

What if device-related data could be monetised and turned into a revenue opportunity?

Thanks to blockchain, data from streetlights, parking lots, waste bins, environmental sensors, and other urban objects can be transformed into tradable tokens. Think of the information a parking sensor generates about the car lot being vacant or busy. It can become a token and traded; parking operators can buy these "info-tokens" to design and offer their own smart parking services. These can fuel private businesses, while cities turn their parking sensor investment into revenue, at the same time as benefitting from lower traffic and pollution, and higher quality of life.

"Info-tokens" can be derived from virtually any sensor in the urban network. Environmental data such as the density of PM10 and PM2.5 particulates, carbon monoxide, among others, can be used to feed traffic mitigation applications and dynamically manage restricted traffic zones based on air quality. Universities, start-ups and any other local organisation can design innovative applications and services by mashing up different data streams.

Open, interoperable foundations

Information is the new asset class for cities in the 21st century. Smart cities cannot be limited to connecting devices and automating processes: they are about data becoming a tangible value for the benefit of all. Cities will be increasingly challenged to change their game, and turn investments aimed at cost savings into opportunities for revenue and new economies generation. We are ready to shape and support this transformation, providing open, interoperable and blockchain-powered technologies for outstanding urban innovation. ■
www.pdxeng.ch

Passionate and eclectic technology expert Gianni Minetti has more than 25 years of business experience with a focus on Internet of Things, smart technologies, blockchain and cryptography. In 2005 he founded Paradox Engineering as the vehicle for bringing his innovative technology vision to the market through pioneer IoT platforms for smart environments. He is currently CEO of the company, which has been part of MinebeaMitsumi Group since July 2015, and also active investor and advisor to several blockchain venture projects. He is based in Ticino, Switzerland.

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Speed enforcement on one of the world's longest sea bridges

Measuring and enforcing speed violations in the Middle East requires special systems and technology. For example, climate conditions necessitate systems working reliably at high temperatures and modern megacities call for technology that integrates well into the urban environment.

One recent example is one of Kuwait's major infrastructure projects. The Sheikh Jaber Al-Ahmad Bridge links the capital Kuwait city with both the Subbiyah region in the north (Subbiyah Link 36km) and the Doha suburb in the east (Doha Link 12km). The bridge significantly reduces travel distance and time between Kuwait City and the forthcoming Silk City.

Ensuring the highest possible

level of traffic safety on this prestigious and strategic bridge is an important concern. Jenoptik, together with its local partner First Joint Group, was able to install a perfectly suited solution for this exceptional project.

A number of average speed enforcement systems have been installed on the Sheikh Jaber Al-Ahmed Bridge. Eight laser scanners and cameras are in operation to monitor average speed on the bridge's four lanes per direction. If a vehicle's average speed exceeds the maximum permitted, the

system automatically records all data relevant for prosecuting the violation. The system is further able to classify all vehicles using the bridge and to apply relevant speed limits to the corresponding vehicle class. Additionally, several spot speed measuring devices, based on radar technology housed in a Jenoptik TraffiTower, are active simultaneously, covering both directions on the bridge.

"Our long-term partnership with the State of Kuwait and our holistic technology approach helped us to come up with a complex and customised solution. We are very proud to be part of the country's efforts to make roads safer for the nation's progress," says Jenoptik's area sales manager, Brahim Lemjimer.
www.jenoptik.com

COVID-19 PROMPTS DATAFROMSKY'S 'LARGEST EVER' TRAFFIC SURVEY

DataFromSky is inviting anyone in the traffic or transport industries to join the open traffic Covid-19 dataset initiative which will document changes in traffic behaviour due to the pandemic. Traffic volumes, patterns, pedestrian spacing and other factors from around the world can all be analysed.

The initiative is supported by leading research institutes and is open to everyone in what has been described as the largest community traffic survey in our history.

As Lenka Šedivá, project manager at DataFromSky points out, our transport behaviour has changed during the Covid-19 outbreak. "But by how much? In what aspects? Have pedestrians started driving? What distances do they keep? Are these returning to normal after the crisis is over? What is the correlation to emissions decline? Noise pollution?" she asks.

"There are so many interesting questions, and we have the tools to answer them," Šedivá continued. "You have the data, so let's work together and build a unique dataset for

the future. Everyone can feel the change. We want to measure it."

To take part, participants in this ground-breaking project just need to upload their video footage to DataFromSky's online service. When asked, agree to include footage in the dataset. "It's as simple as that, and we will thank you by processing the whole video free of charge," Šedivá explains. "The dataset is publicly available for everyone. You contribute the content, we contribute our acclaimed traffic analytics, and NVIDIA supports us with computational GPU AI power."

DatafromSky's invitation to all traffic researchers, engineers and individuals from around the world for recordings of traffic nodes and public spaces, has three main objectives: to document how things were prior to the Covid-19 outbreak; while the social distancing measures are in place; and after life returns to normal.

"We appeal to everyone to go through their archives and uncover hidden gems that can

enrich the Covid-19 dataset," says Šedivá. "In that way, old traffic recordings will get a second life that can be turned into valuable traffic insights for a better future."
www.datafromsky.com/covid-19/

Lenka Šedivá

TOMORROW'S TRANSPORT WILL BE FULLY CONNECTED - SIEMENS

Receiving incident alerts directly in the car, always riding the green wave, being stuck less often in traffic jams: the digitalisation of the road helps to enhance everybody's quality of life, generates economic growth and contributes to climate protection.

Taking all this into account, Siemens Mobility has developed Sitraffic Vehicle2x technology: a secure, cooperative communications innovation that connects vehicles of all kinds with the infrastructure. With Vehicle2x from Siemens Mobility, the road can now be connected to the Internet of Things (IoT), providing infrastructure with the necessary "intelligence".

This means not only will vehicles communicate with each other, but infrastructure and other road users will also be connected.

Trains, cars, ships and other means of transport travel on routes that cross in many places. For Siemens Mobility, visions of future traffic based on the IoT include permanent real-time communication between infrastructure and vehicles. Road users will be warned in good time of potential dangers, such as accidents or black ice, and informed of construction sites so drivers, or in future the car itself, can act accordingly.

The combination of Sitraffic Roadside Units and Cooperative Management Systems (CMS) make it possible to monitor traffic situations in precise detail and control it proactively. This results in a smoother flow of traffic, fewer accidents, more safety and a significant reduction of polluting emissions. This technology can be leveraged to increase safety on city streets by reducing congestion and optimising traffic flow to realise a substantial contribution to climate protection and lasting improvements in the quality of life across entire conurbations. Siemens Mobility is offering administrations and authorities the opportunity to enable cities fit for the future and transform them into environmentally friendly green cities.
www.mobility.siemens.com

Innovations for safety

PSS Innovations is aptly named: 30 years ago the company was the original innovator to apply the now commonly used rubber tyre collar ballast on the plastic safety drum. From that one device and through continuous innovation, and with consultation, education, and training, PSS works to save lives and has developed a full line of compliant, traffic safety devices.

In the early 2000s, after listening to a customer's need for a temporary portable rumble strip (TPRS) to alert distracted drivers to oncoming work zones, it was discovered that a top performing TPRS couldn't be made from plastic.

This is when PSS developed the RoadQuake TPRS out of engineered polymer materials, and launched a very effective, traffic safety countermeasure that requires no adhesives.Since its introduction into the market, PSS has continuously improved RoadQuake and added to the RoadQuake family of products, including the introduction of the Crib and the Raptor to make deployment and retrieval safer and more efficient.

The Raptor rumble strip handling machine transports, deploys, realigns, and retrieves RoadQuake TPRS in work zones, making use of RoadQuake safer and easier than ever. With Raptor, workers deploy and retrieve RoadQuake - all from the safety of their work vehicle.

The PSS product line also features products to protect pedestrians in work zones, including the MASH-tested SafetyWall ADA-Compliant Longitudinal Channeliser and the LaneGard 3 Type III Barricade.

As David E Cowan, president and CEO of PSS Innovations points out: "We don't just talk about innovations for safety—we live it."
www.PSS-Innovations.com

ORIUX
Experts in Mobility

Oriux's line of ATC Traffic Controllers

powered by **GREEN**Wave

GREENWave is Oriux's world class leading local intersection software. Linux based multiprocess traffic engine and NTCIP communications protocol. Featuring the most advanced Transit Signal Priority and Light Rail preemption algorithms in the market and an embedded web interface for remote wireless access. Included on every Oriux ATC traffic controller, providing users the flexibility of a variety of hardware configurations for different applications. Installed in over 30,000 intersections worldwide.

ORIUX - Technology innovator of Intelligent Transportation Systems, providing the world with safer roads and better mobility.

GREENWave Web Interface

Remote Access and Control via Secure IP Communications.

C5000

Compact and Modular Design. Supports up to 32 Signal Groups.

ATC - CBD

Compact model. Ideal for Central Business Districts.

ATC - 2000

Rack Mounted. Compatible with CALTRANS style cabinets.

ATC - 1000

Shelf Mounted. Interchangeable TS2 I/O modules.

Traffic Signal Products | Data Colletion | ITS Software

www.oriux.com

WARNING LAMPS

Φ100 mm

Φ100 mm
L2H

- Power: DC 12V or 24V (recommended battery - 70 Ah)
- Dimensions of the pulsator: Φ 130 mm, height 50 mm, weight 0,2 kg/pc.
- Shade diameter: Φ 100 mm
- Color of the lampshade: transparent (yellow LED)
- Housing: black
- Light source: LED PCB with increased light intensity
  with a special optical system that meets the parameters of lamp class L2H
  (light 500 cd) according to the standard PN.EN 12352:2010
- Average power consumption (one lamp):
  LED PCB - 0,04 A (12V) or 0,02 A (24V)
- Type of lighting: pulsating light - LED - 2Hz, 120 or 60 flashes/min.
- Twilight regulation of lighting intensity: LED - day 100% / night 50%
- Type: LWOD-12/24V-100/L2H

Φ200 mm

Φ200 mm
L8H
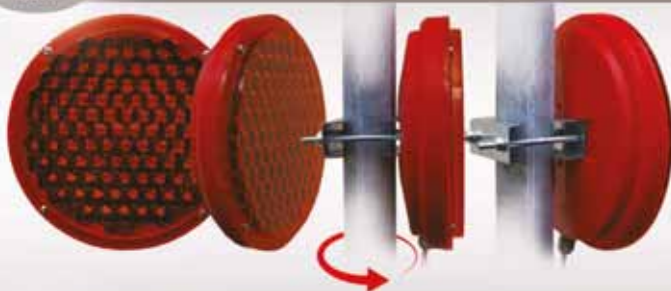
- Power: DC 12V or 24V (recommended battery - 120 Ah)
- Dimensions of the pulsator: Φ 210 mm, height 60 mm, weight 0,6 kg/pc.
- Shade diameter: Φ 200 mm
- Color of the lampshade: orange (green or red light to order)
- Housing: red
- Light source: LED PCB with increased light intensity
  with a special optical system that meets the parameters of lamp class L8H
  (light 2000 cd) according to the standard PN.EN 12352:2010
- Average power consumption (one lamp):
  LED PCB - 0,4 A (12V) or 0,2 A (24V)
- Type of lighting: pulsating light - LED - 2Hz, 120 flashes/min.
- Twilight regulation of lighting intensity: LED - day 100% / night 50%
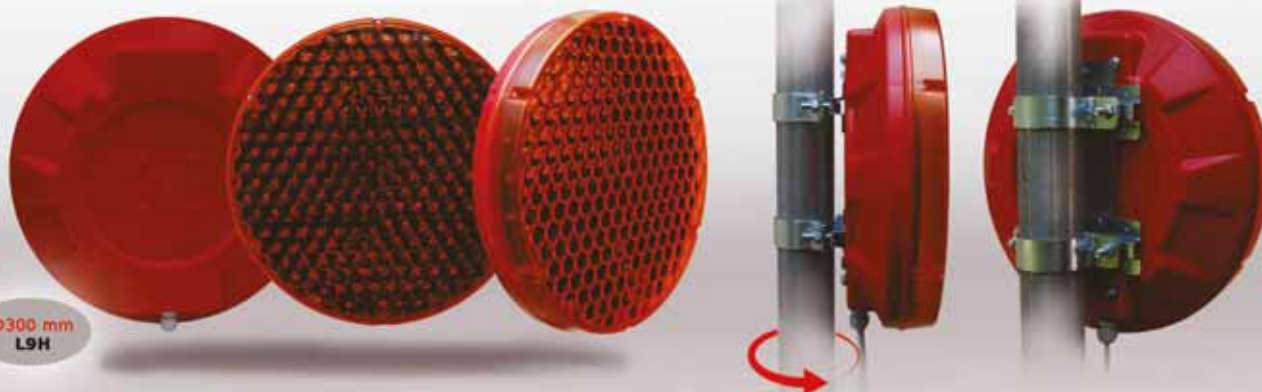- Type: LWOD-12/24V-200/L8H(S)

Φ200 mm
L8M

- Power: DC 12V or 24V (recommended battery - 120 Ah)
- Dimensions of the pulsator: Φ 210 mm, height 100 mm, weight 0,6 kg/pc.
- Shade diameter: Φ 200 mm
- Color of the lampshade: orange (green or red light to order)
- Housing: red, black or yellow, the possibility of screwing the lamp shield
- Light source: LED PCB with increased light intensity
  with a special optical system that meets the parameters of lamp class L8M
  (light 600 cd) according to the standard PN.EN 12352:2010
- Average power consumption (one lamp):
  LED PCB - 0,4 A (12V) or 0,2 A (24V)
- Type of lighting: pulsating light - LED - 2Hz, 120 flashes/min.
- Twilight regulation of lighting intensity: LED - day 100% / night 50%
- Type: LWOD-12/24V-200/L8M(M)

Φ300 mm

Φ300 mm
L9H

- Power: DC 12V or 24V (recommended battery - 120 Ah)
- Dimensions of the pulsator: Φ 330 mm, height 90 mm, weight 1,1 kg/pc., Shade diameter: Φ 300 mm
- Color of the lampshade: orange (green or red light to order), Housing: red
- Light source: LED PCB with increased light intensity with a special optical system
  that meets the parameters of lamp class L9H (light 20 000 cd) according to the standard PN.EN 12352:2010
- Average power consumption (one lamp): LED PCB - 0,5A (12V) or 0,25A (24V)
- Type of lighting: pulsating light - LED - 2Hz, 60 flashes/min.
- Twilight regulation of lighting intensity: LED - day 100% / night 50%
- Type: LWOD-12/24V-300/L9H

Rigel Traffic Monitoring & Incident Detection

Tattile has launched the innovative Rigel embedded plug-in software tool as an extension suitable for the company's double head ANPR (ALPR) cameras. It enables traffic analysis features providing an all-in-one solution for reading plates, traffic monitoring, incident detection, traffic data collection and smart city initiatives.

The Rigel real-time traffic analyser, totally based on artificial intelligence (AI) algorithms, can manage alarms and notifications; report plate numbers, and a range of traffic events directly to the aggregating software running on a remote server. Traffic events include stopped vehicle; slow-down and queue; wrong-way

detection; pedestrian detection; smoke and low visibility; lost cargo; traffic density; and vehicle counting

The aggregating software works as a forwarder of all the collected events to all third party systems, like VMS or SCADA platforms, supporting standard protocols. It integrates with the most commonly used video management and alerting systems, allowing the control room to have a quick overview of all traffic events and take action accordingly.

The software can work in different scenarios, either in approaching or receding traffic, day and night and on multiple lanes. All add-on software can be uploaded even if the camera is already installed.

The launch of the Rigel

software tool follows the recent launch of two other software add-ons - the Tattile Axle Counter for ETC applications and the new BCCM (Brand,

Class, Colour and Model recognition) algorithm which is based on AI running inside an ANPR camera.
www.tattile.com

WPS PARKING BARS THE BARCODE

For decades, the barcode has been the most dominant and commonly-used identifier in parking. Now, WPS Parking has announced it is saying goodbye to the barcode, the first total parking solution provider to do so.

There are several reasons why WPS is moving away from barcodes, says Jesse Heitlager, director technology. "The 1D barcode generates a poor customer journey

to parkers against high running costs. Add to that the possible litter caused by thrown away tickets, and the fact that users actually need to touch the parking equipment."

WPS will move to three different techniques that offer significant benefits to car park operators and users. The first is automatic number plate recognition (ANPR) which offers fast entry and exit. Clear visual

instructions and smart failsafe in the event of obscured, damaged or difficult to read number plates ensure a good customer journey. ANPR also provides opportunities to extend self-service options; the ability to alter products, or sell alternative products via large touchscreens with PCAP technology. Additional modules, like the business parking portal, enables operators to provide users with VIP treatment.

WPS will also offer contactless identification methods with payment card or phone. As Heitlager points out, fully contactless means no moving parts or consumables so that the total cost of operation is lowered, even for smaller lots making them more profitable.

QR-codes are the third technique WPS will offer to replace barcodes. "They create additional touchpoints with parkers and are great to use in shopping environments," says Heitlager. "With a payment app like WPS-Pay, consumers have a pay station in their pocket! This app offers customers pay-as-you go and provides operators with an upsell possibility to existing season ticket options. The app also forms the front end of the WPS web shop, which enables reservations during special events or against a special tariff."
www.wpsparkingsolutions.com

TDS SETS SIGHTS ON HAMBURG WIM TEST

Traffic Data Systems (TDS) wants to complete a direct enforcement test site using its weigh in motion (WIM) system in Hamburg, Germany. "The city of Hamburg is the first cooperation partner in Germany to demonstrate a WIM system for direct enforcement," explains TDS CEO Florian Weiss.

The authorities are currently using the TDS solution to calculate the maintenance required on an old three-lane motorway bridge. "They needed a WIM system to see truck activity," he continues. "Police use it as a pre-selection device at a nearby rest area. So the system is installed and currently used for statistical and pre-selection applications."

At present, there are two lines of sensors per lane – but three independent measurements are needed for enforcement/tolling. "An extra array of sensors can be installed when the city of Hamburg gives the go-ahead," Weiss says. At that point, a gantry, ANPR cameras, laser scanners and road weather information systems shall also be installed.

"Any WIM system for enforcement and/or tolling applications needs to be certified and tested according to the OIML R134-1 standard," he adds. The OIML certification of the TMCS-IP will again be carried out at a test track in Germany. Weiss says he hopes the system will be ready in May 2021, which means delegates at next year's ITS World Congress in Hamburg will be able to see it in operation for themselves. **www.traffic-data-systems.net**

Aimsun launches free viewer for mobility models

By popular demand, and as part of a growing range of measures to aid working from home, Aimsun has launched the Aimsun Next Viewer. The Viewer is totally free of charge and allows third parties to check mobility model outputs remotely, even if they don't have access to Aimsun Next modelling software themselves.

"From a consultancy perspective this is really exciting," says Paolo Rinelli, global head of product management at Aimsun. "The Viewer will save so much time and effort: if project owners have a direct window into the transport modelling team's progress, it gives them more agency in analysing outputs, which in turn enables closer involvement, better communication during a project, and a more efficient workflow."

The Viewer's focused functionality means that even non-modellers will find it easy to operate. It allows a remote project owner, stakeholder or consultant to replay a recorded simulation or to retrieve data from a previous execution of any Aimsun Next model. Users of the Viewer are free to filter and customize what they see, but since there is no need to make changes, there are no editing functions and the focus is entirely on visualisation. **www.aimsun.com/aimsun-next-viewer/**

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Our system uses a patented design capable of disconnecting and connecting cameras, utilizing CAT6 or CAT5e Ethernet or analog cable with separate power, without signal loss. All servicing is done at ground level. Hazardous, expensive, and time consuming high lift maintenance trucks and lane closures are eliminated. The efficiency of cameras mounted at 50 meter heights need not present a problem in servicing the CCTV camera or other equipment. Mounting applications include pole, tower, and wall mount.

All signal/electrical contacts are gold plated over nickel over copper, providing the BEST signal and corrosion free contacts in a water-proof disconnect unit.

Gold plated pin and socket contacts with stainless steel alignment pins.

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Impressive results from Oriux LRT preemption and TSP

Oriux, the evolution of Peek Traffic, has announced that it has developed and deployed a customised solution for the city of Minneapolis to reduce the delays caused at traffic intersections from repeated light rail train (LRT) preemptions and eliminate stops between LRT stations.

"The ultimate solution involved a unique combination of features in GreenWave, Oriux's Linux-based local intersection software, including LRT preemption, peer-to-peer logic, pedestrian overlaps and transit signal priority (TSP)," says Gustavo de la Pena, VP of sales, Oriux.

Peer-to-peer logic and TSP work in conjunction with time-of-day signal coordination plans to allow trains to move from station-to-station without stopping in between. When trains are not present, TSP allows extra green time to be given to non-transit vehicle phases and extra walk time to be given to pedestrian movements.

The system is monitored on Oriux's Spinnaker ATMS software by both city traffic staff and transit staff, giving complete visibility of real-time operations and historical logs for maximum civic benefit. The powerful TSP logs in Oriux's GeenWave software provide transit agencies with a clear understanding of the impact of TSP events on general traffic.

"Results were immediate and impressive," says de la Pena. "Former wait times to service a phase movement were recorded as high as 11 minutes. After deployment, maximum wait times are about four minutes. Also, LRT travel time was reduced by one minute, allowing the transit agency to remove one train set from daily operation."

Oriux's GreenWave features the most advanced light rail train preemption and transit signal priority in the market and is the preferred traffic controller by some of the major transit agencies in North America.
www.oriux.com


TRUVELO UNVEILS NEW ENFORCEMENT CONCEPT

Truvelo (UK) has announced a new type of VMS — the Violation Management Server, a cloud-hosted solution which is already being rolled out with UK police services. The current roll-outs with police in the UK will enable them to package data from spot speeding offences for insertion into the country's existing national offence-handling solutions, says Calvin Hutt, sales and marketing director. However, that one application uses but a fraction of the VMS's fuller capabilities.

The VMS will also be able to manage average speeding offences and provide an ongoing traffic data collection, processing and interpretation capability which can support a number of functions. These include general infrastructure monitoring as well as providing the evidence needed to justify the installation of enforcement cameras, for instance.

The VMS will be available internationally and Truvelo (UK) will offer two versions: an internal private cloud version which will operate on servers behind customers' own firewalls; and another which it will provide as Software as a Service (SaaS) using Microsoft Azure.
www.truvelouk.com
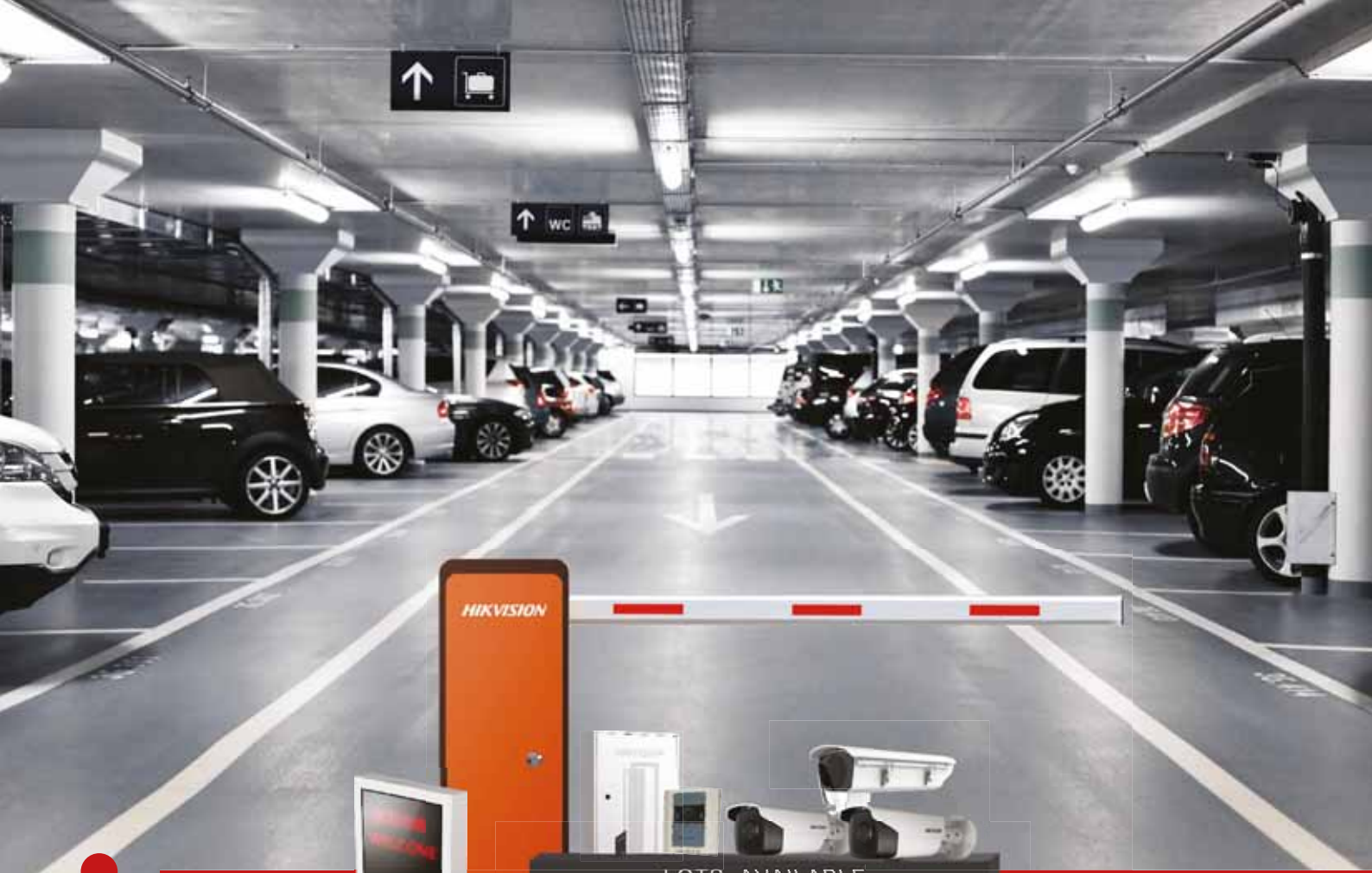
SMART PARKING MANAGEMENT
DELIVERING SMOOTH AND INTUITIVE PARKING EXPERIENCES

EFFICIENT CAR PARK MANAGEMENT

- Automatic detection of available parking spaces
- Automatic control via license plate recognition and under-vehicle screening systems
- Video surveillance for vehicle-related security events
- Robust parking log with vehicle data and alarm info

SMOOTH CUSTOMER EXPERIENCE

- No congested entrances or exits
- Available parking spaces indicated by arrow & colour
- Find-my-car terminals
- Effortless navigation through the car park via the shortest, most convenient routes

REMOTELY MONITOR AND CONTROL PARKING FACILITIES

The Paradox Engineering Smart Urban Network allows municipalities to monitor and control parking facilities remotely, collecting and taking advantage of a full range of parking-related data, such as the number of available lots in a specific area, the duration of each parking and possible abuses, including vehicles exceeding time limits, unauthorised parking in disabled spots or in electric vehicle charging stations, and more.

These pieces of information enable smarter management of existing facilities and the increase of average usage rates, with the opportunity of setting dynamic pricing schemes and even launching emission-based fares. By seamlessly integrating the solution with mobile apps, variable message panels and traffic guidance systems, it is possible to alert drivers with real-time parking availability and route them to the nearest facility.

Paradox Engineering, part of the MinebeaMitsumi group, says people will enjoy an easier, quicker, cheaper and more relaxed parking search, as traffic congestion will be reduced by up to 30 per cent, thanks to the decrease in cars looking for a free parking lot. Air pollution will be reduced accordingly.

The solution opens up the opportunity to launch additional services by collaborating with third parties.

For instance, the Smart Parking mobile app could be enriched with toll payment features and online booking services. At the same time, local shops and businesses could be given the means to offer parking coupons and valet services, or reserve spaces for their own customers. **www.pdxeng.ch**

Digital signs make sense, says Avery Dennison

The ability to cost-effectively digitally print traffic signs is turning heads in the highway industry. This technology's ability to significantly reduce stagnant capital by printing short, medium, and long production runs as needed and eliminating the burden of screen printed made-to-inventory signs is creating new competitive edge opportunities for sign shops embracing the technology. It is also attracting new entrants who see that market entry has become simpler and with a lower investment due to the elimination of infrastructure needed to mass-produce signs.
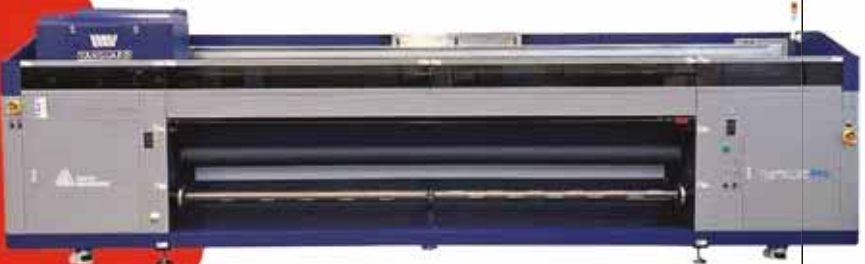
"Beyond capital savings from smaller inventories, additional savings can also be realised in smaller production facilities and the costs associated with utilities, insurance and taxes," explains Ashish Shukla, senior director, strategy & global marketing, Avery Dennison Reflective Solutions. "While the equipment and production flow are different, digital can simplify production by eliminating the practice of batching multiple orders to generate longer runs of identical signs. And, by moving products out the door and into the hands of customers in fewer days, there is the benefit of improving cash flow."

The solution for a digital print transformation for sign shops of every size is here with the Avery Dennison TrafficJet Pro and TrafficJet Xpert systems. Shops that adapt to changes and find ways to master the technology will find the move to digital rewarding, and instrumental in solidifying their presence in the industry. That's the reason so many modern traffic sign shops are moving towards cleaner, efficient, sustainable print production.
www.reflectives. averydennison.com/trafficjet

Video-based PGS conquers changeable outdoor environments

Taiwan-headquartered Parkxper is highlighting its camera-based parking guidance system (PGS) which is a major building block of the company's integrated advanced parking system.

As the demand in parking convenience and car search accuracy increases in car parks, Parkxper continues evolving its camera-based PGS solutions. In addition to indoor parking guidance system, Parkxper's parking system expands to an outdoor environment with versatile weather-proof LPR cameras.

Using deep-learning vehicle detection and LPR technology, the outdoor PGS system is more adaptable to strong-lighted and rainy settings. Its camera comes with five-megapixel lenses and WDR feature, which easily recognises 4-6 vehicles, day and night.

In a prestige deployment, car finder kiosks were installed around the station for drivers to search for both indoor and outdoor vehicles, preventing the drivers from walking around the lot looking for their car, thus taking longer to exit the lot than they should. The system not only makes it simpler for drivers to find their vehicles, but it is also easier to manage by knowing the occupancy rate.

Parkxper is deployed in several prestige locations, including Taiwan high-speed rail's Taichung Station, a park-and-ride facility on four levels with some 1,482 parking spaces including an outdoor parking level with 368 spaces.

Parkxper was tasked with reliving the stress of finding parking spaces during rush hour. With the help of the company's intelligent parking management system, it has made it even easier for drivers to finish parking within three minutes.
www.parkxper.com

AGD SOLUTIONS FOR TRAFFIC AND PEDESTRIANS

Leading manufacturer of ITS product solutions AGD Systems is highlighting its traffic and pedestrian solutions for urban crossings and junction control: the 326 on-crossing detector; the 641 detector, which monitors the wait area, and the large-zone 645 detector with volumetric capability. The entire suite benefits from safe, easy remote setup via smart phone or tablet with WiFi AGD Touch-setup.

AGD's new 343 Highways Monitoring Radar was developed using the company's expertise in designing speed enforcement radars.

The 343 is an easy-to-integrate traffic flow monitoring solution that provides real-time data on multi-lane highways. It can be mounted as close as two metres from the inner edge of the inside lane of the carriageway and will still provide information for the lane immediately below the radar, as well as the lane on the farthest point of the carriageway.
www.agd-systems.com

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WPS brings together best-in-class technology and practical innovations. We offer integrated parking solutions and high quality services that make parking easier.

With parking solutions which are smart and reliable, and service concepts you can rely on, we are fully committed to the success of your parking.

WPS parking solutions

wpsparking.com

LUFFT ADDS 40 STATIONS TO BAVARIA'S ROAD WEATHER NETWORK

Lufft has strengthened the road weather monitoring network of Bavaria by building and supplying 40 new meteorological stations. Their operational area covers roads and highways all over Germany's largest federal state.

The typical setup of such a station equipped with Lufft devices comprises an IRS31pro flush-mounted road sensor; a WS600 smart weather sensor mounted on a folding pole; a cabinet for electrics and communications, including a mobile telephony router; and a colour camera with infrared headlights. In total, the scope of the tender won in the summer of 2018 exceeds a volume of more than half a million Euros.

"We are very pleased to expand and consolidate our road weather station network," says Bavaria's Central Office for Road Maintenance Services. "Lufft's sensors make an important contribution to the collection of road weather data, which is key to efficient decision making in critical weather conditions." The vast majority of road weather stations in the network of federal and state roads in Bavaria has been provided by Lufft."

With that, Bavaria's winter maintenance management system can monitor plenty of meteorological parameters, including air temperature, pressure, and humidity, wind direction and speed, precipitation type and intensity. Furthermore, an invasive road sensor measures the road surface temperature, salt concentration and detects a water film height up to four millimetres.
www.lufft.com

Acusensus' 'Heads-Up' warning for drivers using mobile phones

Heads-Up, an innovative solution to enforcing laws regarding drivers using mobile phones has been announced by Acusensus.

The new roadside technology combines speed measurement, number plate recognition and a camera backed with artificial intelligence, to automatically detect drivers using their phone and capture photographic evidence. It is available in both fixed and mobile (trailer-mounted) configuration and is said to operate in all weathers and lighting conditions.

Sensors detect and record the presence and speed of all vehicles while the camera system penetrates the windscreens to capture high resolution images, allowing the company's algorithms to detect drivers illegally touching a mobile phone. Human reviewers are presented with images of drivers detected as touching their phones, while any passengers are obscured and the licence plate data remains encrypted and viewable by only the authority.

If required, the system can be set to automatically blur out everything in extracted images except the driver. The radar-based speed detection system can also be used for speed enforcement, including lane discrimination and vehicle classification, while the licence plate recognition function can be used for both average speed enforcement and unregistered/hotlist vehicle detection.
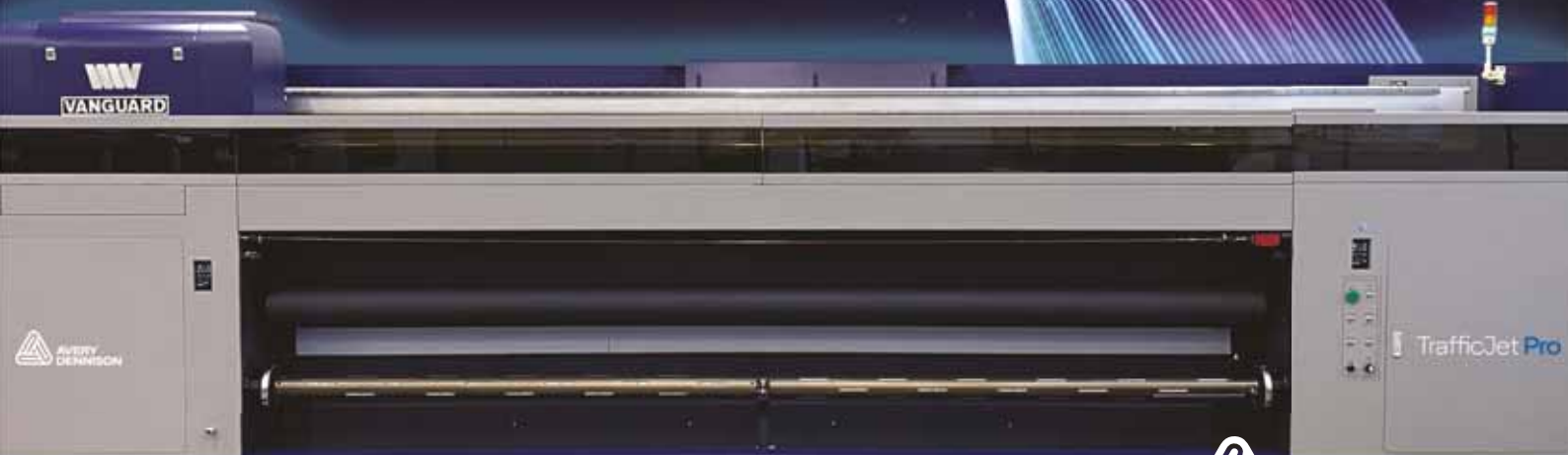
To test the Heads-Up system, Acusensus has partnered with the Government of New South Wales and there are currently two pilot locations in Sydney.
www.acusensus.com

Intercomp expands OIML certifications for sensors

Intercomp's weigh in motion (WIM) strip sensors have achieved OIML R134 Class 5E certification at low- to medium-speeds. This adds an industry first to the company's high-speed WIM applications with OIML R134 Class 10F certification for two, three or four-row configurations of the technology. To achieve this type certification, 2.5 per cent GVW accuracy at low to medium speeds, and 5.0 per cent at high speeds is required.

OIML certification recognises the ability of strain gauge strip sensor technology to collect WIM data in free-flow applications reliably. Ranging from low-speed weight and monitoring applications to automated electronic toll collection (ETC) and direct weight enforcement, the certified sensors can be used up to mainline highway speeds.

Intercomp's WIM strip sensors are installed and grouted in place into 3-inch (75mm) channels cut into the pavement, lowering

installation requirements and traffic disruption to a single day with minimal civil works. The patented strain gauge technology is optimised for WIM applications, actively compensating for a wider range of temperature variables to provide responsive, stable and repeatable weighing in a variety of operating environments and weather conditions. The Intercomp sensors feature connectivity to communicate weight data either via a CPU or integrate directly to a host of other controllers and software for incorporation into ITS systems with cameras and other sensors.

www.intercompcompany.com

GOODVISION TURNS TRAFFIC MONITORING INTO TRAFFIC DATA

Video Insights from GoodVision can turn any standard traffic surveillance device into an automated traffic data collection system. It is designed to help traffic surveyors by automatically collecting traffic data from existing cameras and providing deep traffic analytics to traffic modellers.

GoodVision's AI can be applied to any make of camera, standard video recording or live camera stream. Within an hour, it can analyse, with a claimed 95 per cent accuracy, a video recording to define eight vehicle classes plus pedestrians and bicycles.

Video Insights takes that one step further and provides a wide range of analyses and is described as fully interactive. Parameters such as origin/destination volumes through an intersection can be counted on a single path or a combination of user-defined detection areas to evaluate complex traffic movements and scenarios. Travel time information can be extracted for individual vehicles or pedestrians passing between various detection gates.

Red-light runners, jay walkers and illegal vehicles movements can all be identified and exact trajectories for vehicles and pedestrians can be extracted.

www.goodvisionlive.com

MOBILE TRAFFIC LIGHT CONTROL VIA TOUCH PANEL

Peter Berghaus is highlighting the EPB 24 series mobile traffic light control unit system. This multiprocessor controls temporary large intersection signal systems with a minimum of time and cables.

With the master and slave control units of the EPB 24 series, up to 24 signal groups with a maximum of 48 power cards for 96 three-part, fully monitored LED traffic light signal heads can be controlled. Via a built-in panel PC with a touch screen, inputs and queries can be made directly on-site at the control unit with little effort. A separate laptop is no longer required. Also, data can be imported or read out directly from the panel PC and stored on USB.

A modem is optionally available for encrypted and protected remote operation via the internet. The modem makes it possible, for example, to configure malfunction information via email from the control unit or to send data directly from the system via email. Data comes with an unequivocal control ID number and can, therefore, be perfectly allocated regarding time/date and controller.
www.berghaus-verkehrstechnik.de

SmogStop roadside barrier neutralises emissions

Pollution reaching streets and houses adjacent to major roads can be reduced by up to 90 per cent using a new roadside barrier called SmogStop according to Gramm Barriers, the UK-based European importer for the Canadian manufacturer Envision.

The TL-4 crash rated aluminium-framed barriers feature two 2cm-thick acrylic walls 25cm apart with the outer wall extending above (and angled over) the inner one to increase airflow between the photocatalytic-coated walls. The action of sunlight on the catalytic coating breaks down NOx & VOCs into harmless by-products.

An independent six-month trial of a 6.5m high, 15m segment along Highway 401 near the Canadian city of Toronto, showed an average reduction of 49 per cent in NOx levels outside the barrier and during peak daylight hours the reduction increased to as high as 95 per cent.
www.grammbarriers.com

SMART CITY-READY TRAFFIC CABINETS

Traffic cabinets have been around for a very long time, but EDI's new smart city-ready traffic cabinets are streets ahead of anything that has gone before. Some 2,500 advanced traffic cabinets have been deployed with EDI technology.

EDI's new ATC Cabinet is an open architecture traffic control cabinet based on the ITE/NEMA/AASHTO ATC suite of standards. This new cabinet family offers significant improvements to conventional cabinet designs in modularity and compact size, motorist safety, technician safety, LED compatibility, and diagnostics. AC or DC are supported, and its modular rack-mounted, scalable design allows up to 32-channel configuration.

The ATC Cabinet is intended to update or replace all cabinet types; NEMA TS-1, NEMA TS-2, ITS Cabinet v1, and Caltrans 33X. All EDI ATC Cabinet components meet or exceed the requirements of ASHTO/ITE/NEMA Advanced Transportation Controller Cabinet Standard, ATC 5301 V02.02.
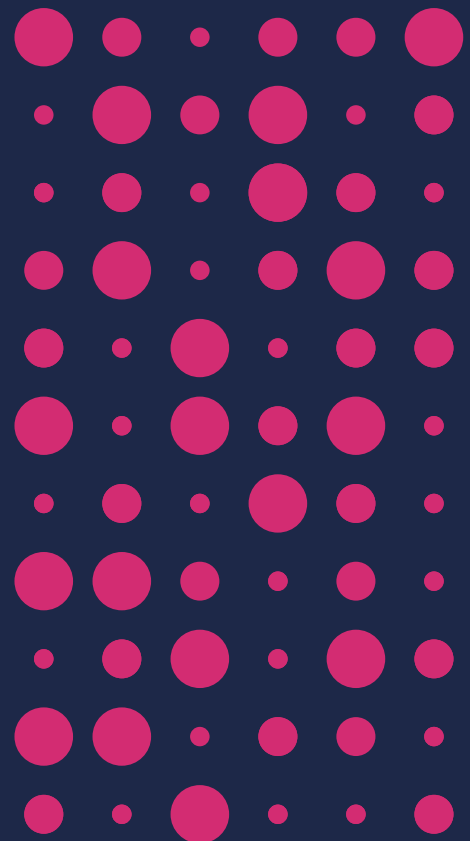**www.editraffic.com/ATCC**

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