VIMALUX

A member of the Felicity Smart Infrastructure Group

HIVE+ TRAFFIC SENSOR

APPLICATIONS, USE CASES AND SOLUTIONS FOR THE URBAN TRANSPORT EVOLUTION

VISUAL INTELLIGENT TRAFFIC SENSORS

-A NECESSITY FOR THE URBAN TRANSPORT EVOLUTION

The exponential urbanization growth of the world increase the challenged of our transport infrastructures. Fast and safe mobility is the corner stone of our continued growth, development and quality of life. At the same time, the urgency to reduce of CO2 emission for the sake of the future of our planet is equally har never been more critical.

To fulfil both these demands, fundamental changes in our transport approach and its underlying technologies is urgently required. The development of connected cars, self driving autonomous vehicles, ITS and similar technologies are all a result of these necessities.

However, at the core of the mobility evolution is data. We can only change the world if we know what it really looks like to start with and the precision, reliability and speed of this data will determine how much we can change.

New traffic data detection and collection technologies are being developed and tried in many places – everything from various radar types, crowd sourced meta data from mobile phones/WiFi, heat signature detection and much more. However, it is only the combination of camera sensors/AI that can provide the granularity and flexibility of current demands, while at the same time have the potential to adapt and evolve with the demands of the future mobility landscape

A visual sensor with AI, literally have the capability to see and understand the same as a human set of eyes, and in the same way, it is able to learn and rekognised new traffic objects, understand traffic scenarios, and resolve or react to conflict situations and incidents.

The vision for our future road networks and public areas, should be a 1:1 real-time digital twin of all major traffic modes, both historically and real-time. With HIVE+ Traffic Sensor, we are one step closer to the fulfilment of this vision.

THE “HIVE TOP FIVE”

1

TRAFFIC SURVEY DATA

Cost and quality improvement of data collection for general road and traffic planning , safety design tasks, tourism development and much more.

2

TRAFFIC LIGHTS AND STREET LIGHTING OPTIMIZATION

Mobility, air pollution and power consumption optimization by real-time adaptive traffic lights control and street lighting operation

3

TRAFFIC SAFETY INCIDENT DETECTION AND EMERGENCY RESPONSE

Real-time incident detection and notification for safety improvements and immediate emergency response

4

BICYCLE, PEDESTRIAN AND MICRO TRAFFIC INSIGHTS

Gain new actionable insights in people and bicycle movements on roads, in public transport and retail spaces.
- and increase the user experience of these vital transport classes.

5

PARKING SPACE MANAGEMENT AND GUIDANCE

Increase parking space efficiency and user experience for both open and closed parking spaces.

TRAFFIC SURVEY DATA COLLECTION

Cost and quality improvement of data collection for road traffic planning and design tasks

WHAT, HOW and WHY?

Traffic and road engineers in municipalities, road authorities and private consultant companies all over the world, delivers analysis, modelling and planning designs for decision makers in relation to investments in new road builds, road changes/improvements etc.

The traffic and road engineering professionals are today forced to rely on adhoc, short term data gathering, that is then statically transformed to determine supply and demand of traffic flows for roads, intersections, parking, safety measure and all the other elements that creates a sufficient and efficient road transport network. The current methods are both expensive and at best indicative due to the limitation of current data gathering methods.

With the fast advancement of camera sensors, Deep Learning, Artificial Intelligence and affordable edge processors, it is today a much more feasible, flexible and adaptable option to collect detailed traffic data using these technologies.

REAL TIME ADAPTIVE TRAFFIC LIGHTS

Improved travel time and reduced air pollution
by real-time adaptive traffic lights control

WHAT, HOW and WHY?

Each time a vehicle wait for a read light, it use 0,02 L of fuel in average. This equal 0,05 Kg CO2*. For a road network of just 1 mill. daily vehicles on the road, one less red light for each vehicle, would result in the savings of 7,3 mill L of fuel and 18,2 mill tonnes of CO2 emission.

This makes it easy to see why there is a huge potential in optimizing capacity and mange the flows precisely to the current traffic levels in traffic light intersections. The data collected real time from HIVE+ Traffic Sensor can easily be integrated as additional data input, as a virtual loop, to a central ITS or onsite Smart Traffic Light Controllers and applied to the optimization schemes/standards of choice.

HIVE+ Traffic Sensor provides open decoded data straight from the sensor, as well as a comprehensive Rest API for easy integration through our backend cloud platform .

REAL TIME ADAPTIVE STREET LIGHT DIMMING

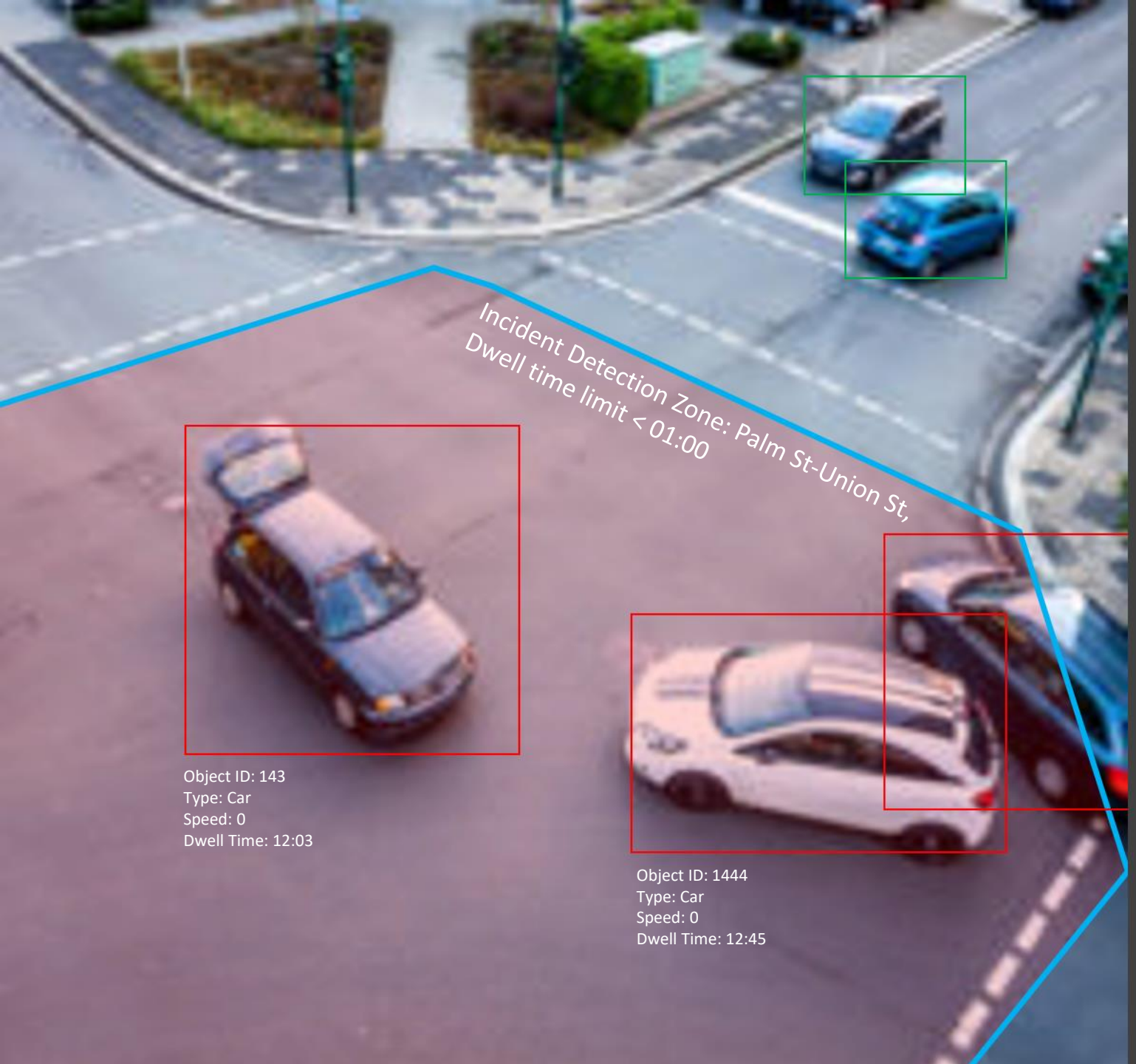
Reduced power consumption by dimming street lights based on the actual traffic density level at a given time.

WHAT, HOW and WHY?

Most modern LED Street light implementations includes the capability of dimming, typically through a Central Management System (CMS). However, typically the dimming schemes are set to fixed scheme and rarely adjusted. Hence, additional major power savings related to actual traffic levels are often missed.

With the vehicle quantity data from HIVE+ Traffic Sensor it is now possible to adapt the street lighting dimming levels according to the traffic level. Using the EU standard EN13201-5:2015, as an example, adaptive dimming setting down to a 20 minutes interval is allowed. I addition the Street Lighting dimming levels can be adjusted by predefined traffic incidents in order to improve safety as well.

Through integration through API or TALQ interface, the HIVE +Traffic Sensor will enable the adaptive dimming instructions to be definedin the CMS



TRAFFIC SAFETY INCIDENTS AND EMERGENCY RESPONSE

Real-time incident detection and notification for safety improvements and immediate emergency response

WHAT, HOW and WHY

Traffic Safety and the response to incidents and anomalies are at the center of any transport system. This is also one of the most exciting and new features that is only possible with a visual sensor.

Detection of stopped vehicles, wrong direction, rule violations, near misses, jay walking and much more are now a possibility to detect in real-time and alert to emergency response teams or to collect historic data for improved road design.

Detection of repeat safety incidents in conflict zones, and/or faster reaction to occurrences, potentially safe lives, clears up gridlocks and ultimately saves money.

BICYCLE and MICRO TRAFFIC COMMUTER NETWORKS

Gain new, detailed and actionable insights for bicycle and micro transport movements on roads and dedicated lanes/networks -and increase the safety, user experience and appeal of these vital transport modes.

WHAT, HOW and WHY?

In urban areas, the potential savings in CO2 emissions by converting commuters to bicycles, e-bikes etc. is enormous. For this reason many cities are upgrading their bicycle paths to Super Bicycle Highways and networks at a rapid pace.

With safer and more accessible bicycle infrastructure - and the availability of electrical micro transport options, these transport modes are for many commuters becoming a viable option.
With better traffic data and insight, this development can be further documented, supported and encouraged.

With a visual AI sensor is now finally possible and feasible to count traffic levels for full days/seasons as well as point to point travel times – all essential data for the assessment of this type of traffic mode.

PEOPLE AND CROWDS MOVEMENTS

With Visual Sensors and AI, it is finally possible to track and collect detailed reliable data for people movements. With edge processing this can be done completely anonymously without any breach of privacy

WHAT, HOW and WHY?

The anonymously collected data will quantify people, their travel direction and dwell times and it also possible detect gathering of crowds and events/incidents. Finally, demography data of age and sex of person detected is also a possibility.

The application of these insights are many and can be used for public transport insights, security alerts or retail purporses, outdoor advertising and much ,ore

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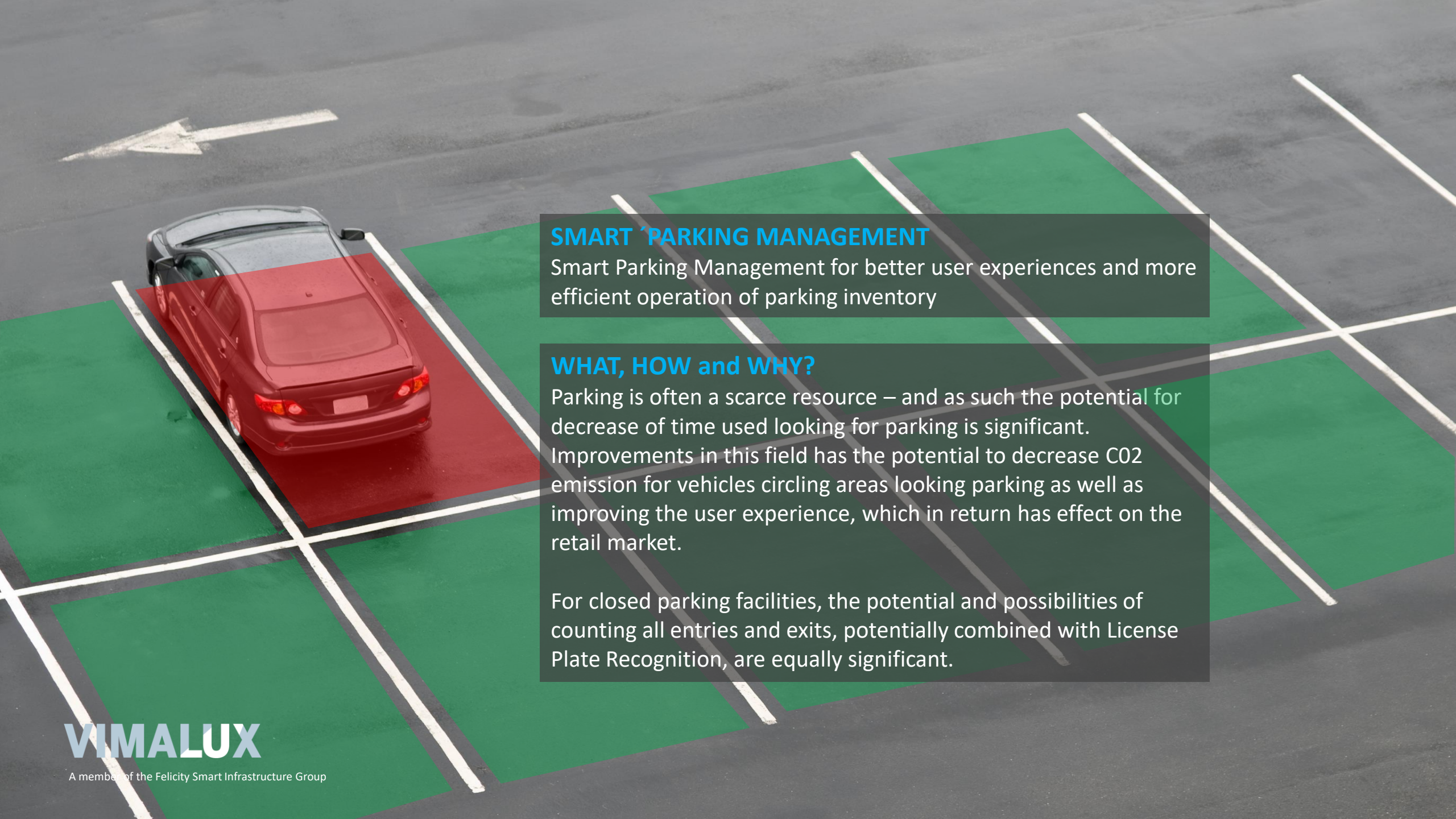

SMART ´PARKING MANAGEMENT

Smart Parking Management for better user experiences and more efficient operation of parking inventory

WHAT, HOW and WHY?

Parking is often a scarce resource – and as such the potential for decrease of time used looking for parking is significant. Improvements in this field has the potential to decrease C02 emission for vehicles circling areas looking parking as well as improving the user experience, which in return has effect on the retail market.

For closed parking facilities, the potential and possibilities of counting all entries and exits, potentially combined with License Plate Recognition, are equally significant.

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TRAFFIC MONITORING SERVICE

PLANS AND FEATURES

HIVE+/GYRO+ Traffic Sensor Unit	**1 Pcs.**
Project site evaluation (1 hour/site)	✓
Sensor Configuration Service (2 hours/unit)	✓
Real-time unencrypted data stream (MQTT/JSON)	✓
Standard 8/5 email support	✓
3 week HW Exchange Service	✓
Sensor and Platform Firmware Updates	✓
4G Data Connectivity (2GB/Month)	✓
Felicity Connect -Unlimited access	✓
Felicity Connect - User configuration and training	✓
6 months of data storage in Felicity Connect	✓

NO CAPEX

GDPR DOCILE

DATA ACCURACY
>90%

AVAILABILITY
> 0.9

DATA RETENTION
6M <

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About us…

Vimalux, a member of Felicity Smart Infrastructure develop, deliver and operate integrated LED streetlights and Smart City solutions for infrastructure owners, operators, integrators and communities.

The upgrade of streetlight technology to LED, not only saves energy and provides better lighting. It is also a not-to-be-missed opportunity for the acceleration of public lighting from a single purpose asset, into an open and futureproof Smart City infrastructure platform, servicing an ever changing urban challenge.

With its unique Scandinavian designs, Vimalux offers a range of modular Smart Node LED streetlights and standalone Smart Node enclosures for a clutter free and consistent outdoor urban appearance, as well as a range of vertical IoT platforms, networks and smart devices . Felicity Smart Infrastructure offers an end to end carefree solution and public/private partnership to bridge the public lighting, Smart City infrastructure, systems operations and services

We have in the last 3 years successfully delivered increasingly larger implementations of its products and concepts across both rural and urban cities and municipalities in Australia and New Zealand. The company is currently on a path to expand its client base in Europe and North America.

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