TVILIGHT

Smart Street Lighting for Smarter Cities

Zhaga RF Mesh (SkyLite Prime)

V06.02.2025

Why invest in Smart Streetlights?

60% - 80% Energy Savings

Dimming streetlights with pre-defined schedule and smart sensors significantly cuts energy waste.

Predictive Maintenance

Proactive alerts / notifications for faults, alarms or outages optimise maintenance and substantially reduce operational costs.

Total Infrastructure Control

Connected streetlights enable remote monitoring, management and control of complete citywide infrastructure.

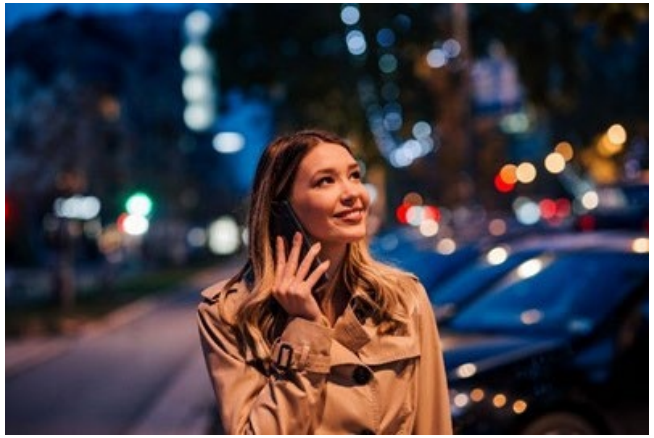
Why invest in Smart Streetlights?

Foundation for Smart City

Standardised interface and Open APIs support inter-connectivity with applications such as traffic lights, security systems, etc.

50% Lower Light Pollution

Dimming streetlights during off-peak hours or through motion sensors significantly cuts light pollution.



Improved Public Safety

Right light and right place and right time enhances citizens' sense of safety.

Why invest in Smart Streetlights?

Address Climate Change

Fine-tuning lighting levels on need-basis dramatically reduces carbon emissions.

Protect Flora and Fauna

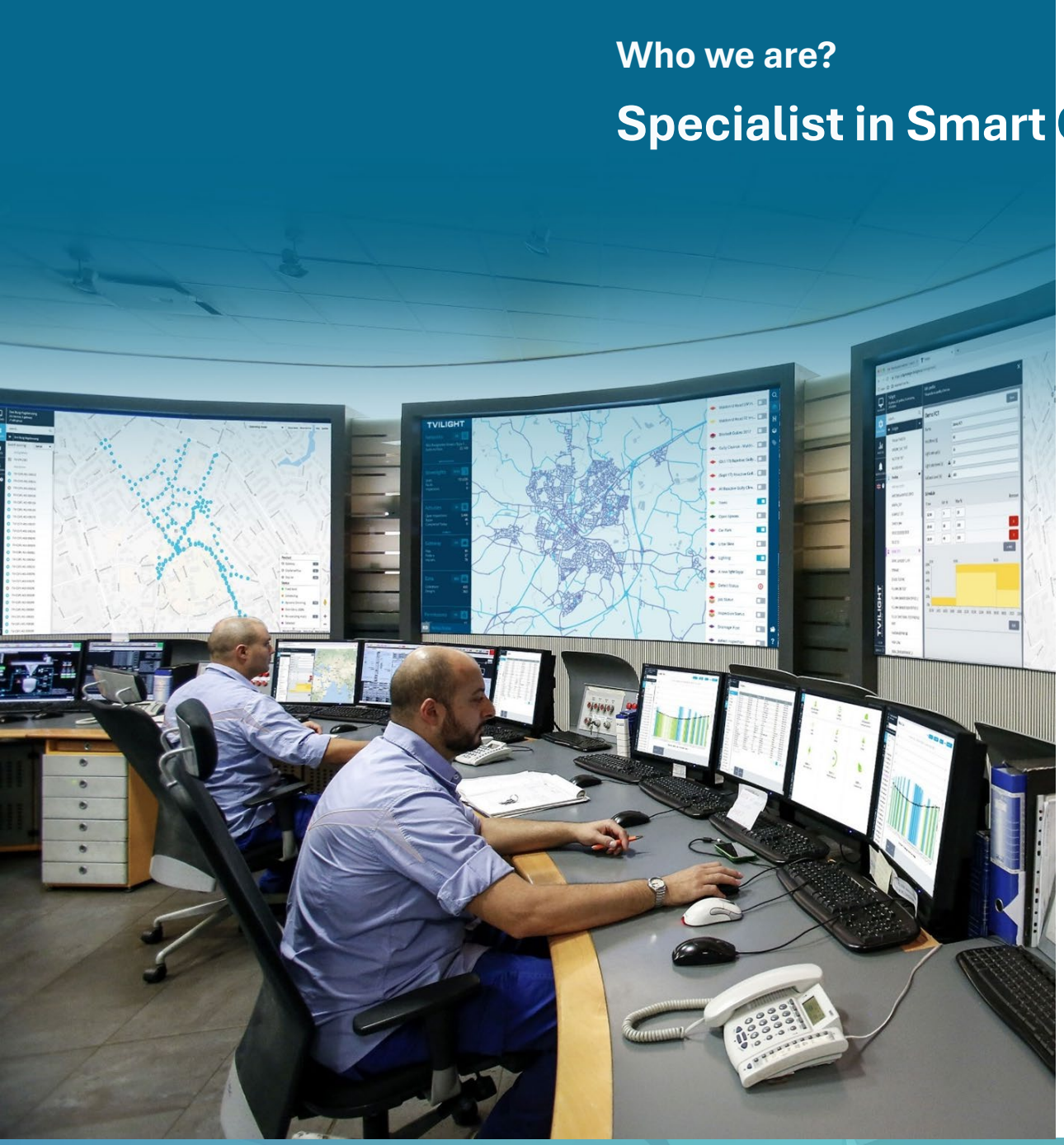
Autonomous dimming during off-peak hours lower lighting pollution and benefits local flora and fauna.

Benefits from Day One

Unlike other smart city solutions, deploying smart lighting deliver benefits from day one!

Who we are?

Specialist in Smart Outdoor Lighting



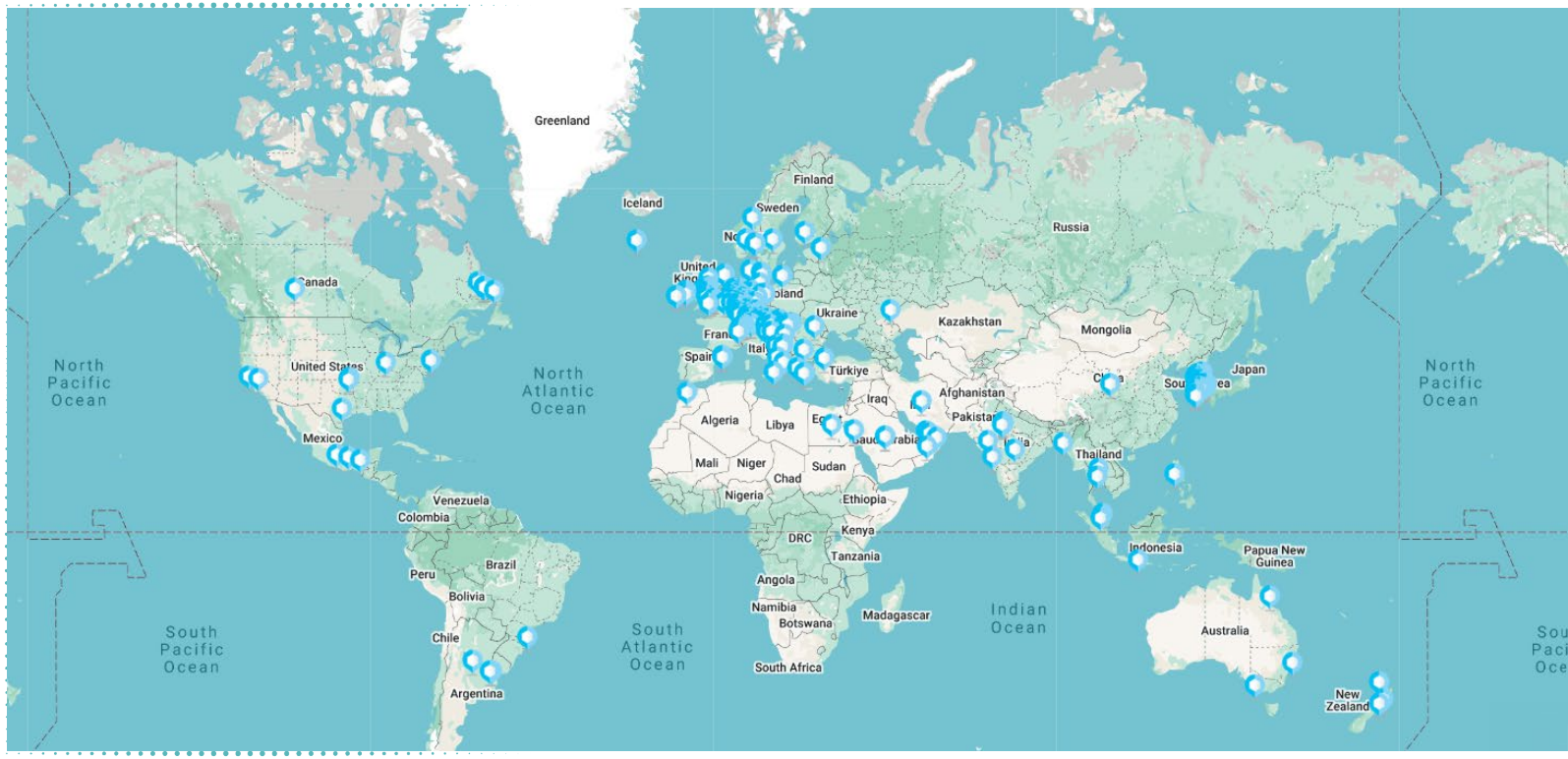
We enable cities to take full control of their Lighting Infrastructure based on Open Standards

Global Presence: Smart Streetlights Operational Across 1000+ Cities

Monitored & Managed by CityManager and Supported by Tvilight Service Desk

Selected Smart Street Lights Projects (individual level monitoring & control)

- Dortmund (DE) 44.000+
- Dutch Railways (NL) 10.000+
- Odos (GR) 10.800+
- Luxembourg City (LU) 9.000+
- Helmond (NL) 10.000+
- Jaipur (IN) 7.500+
- Chattogram (BD) 7.500+
- Seoul (KR) 4.000+
- Indonesia (ID) 2.000+
- Sohar Port + Muscat (OM) 1.500+



https://tvilight.com/case-study/

Urban Streets

Industrial Zones

Residential Areas


Train Stations /
Railway Lines
spoor
2
2
BORINCHEM


Ports / Sea Terminals

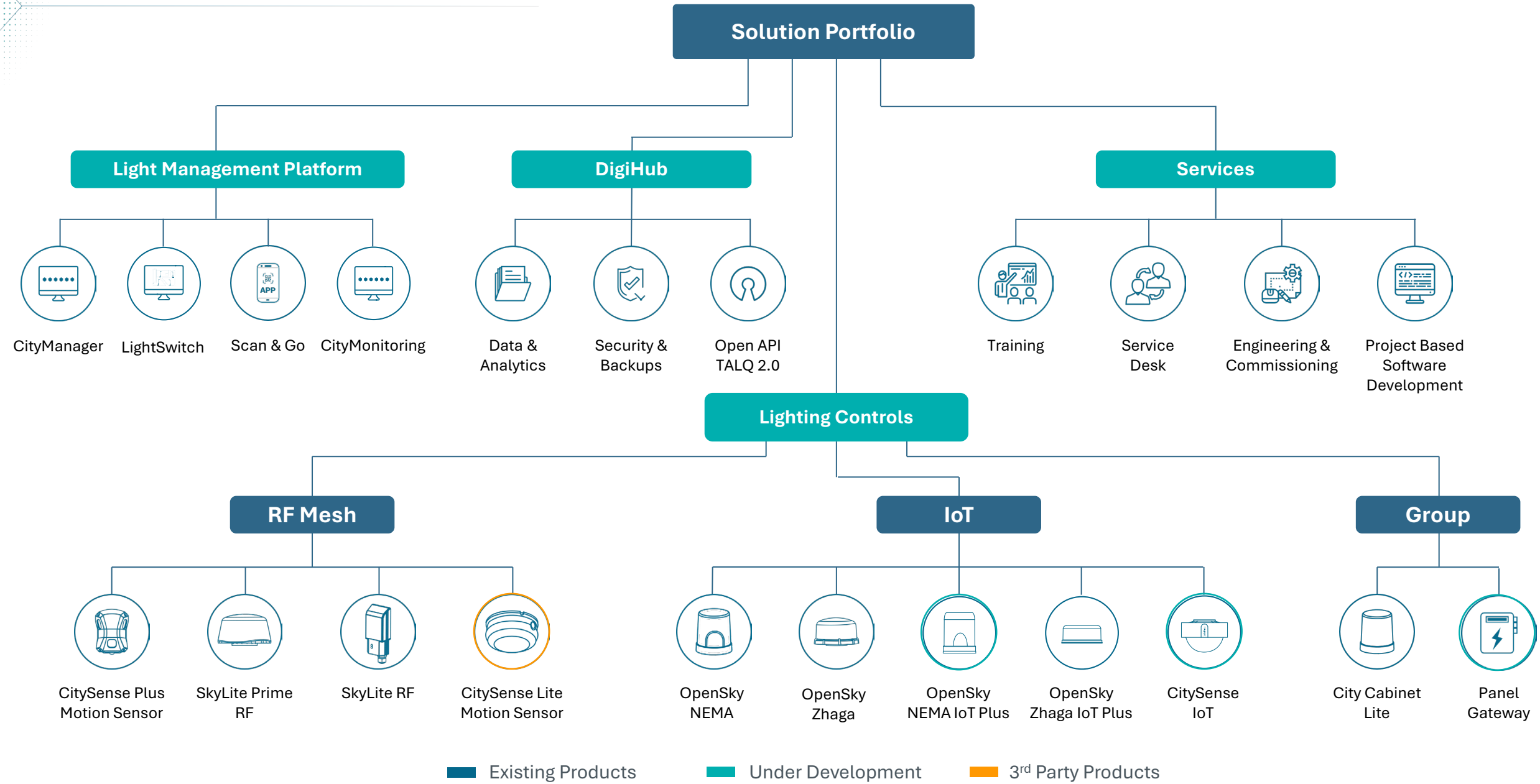

School / University
Campus

Bicycle Roads

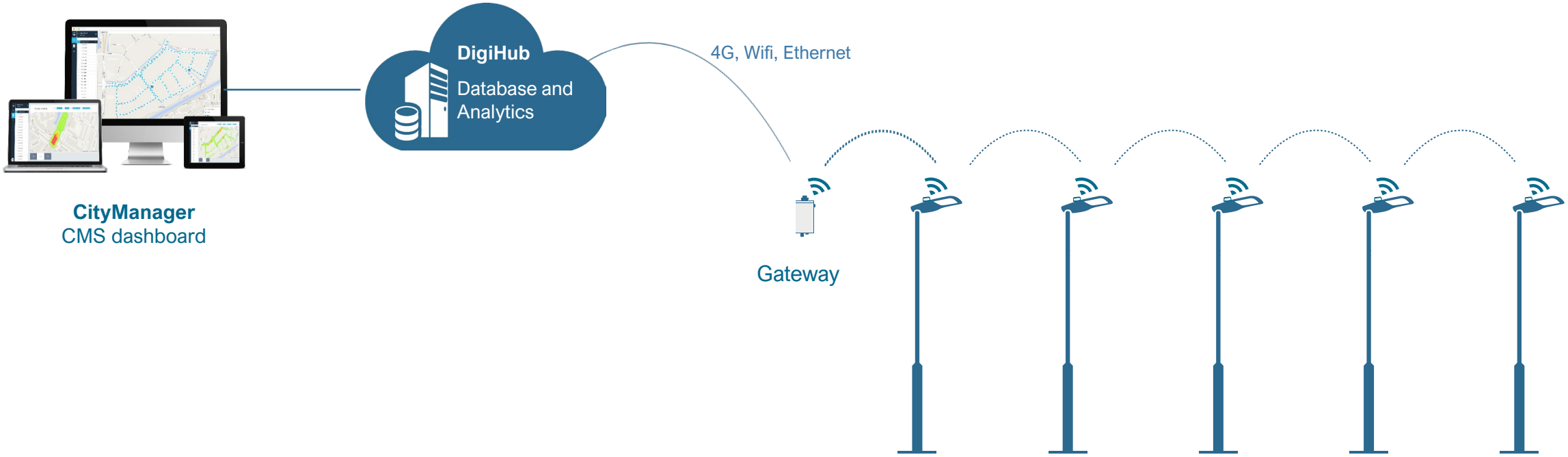
Outdoor Parking

Public Parks

Smart Lighting Solutions



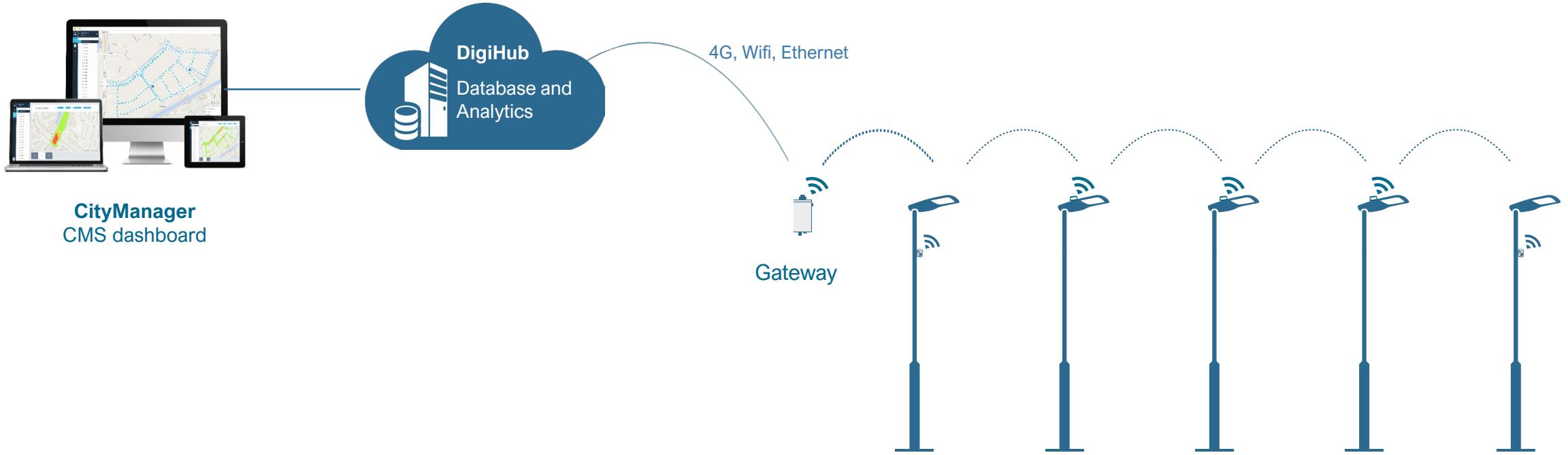
Smart Lighting with Secure Wireless Mesh Network



Wireless Smart Lighting

- 2,4 GHz network, 250 kbps
- High bandwidth, low latency
- Real-time RF Mesh network
- High security 128 AES encryption

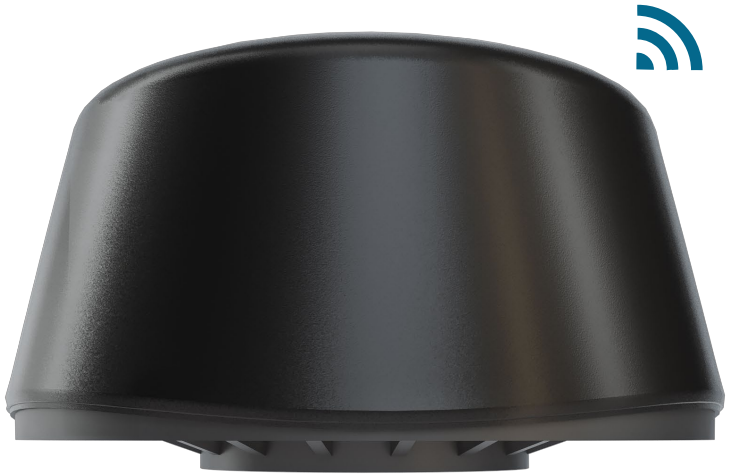
Smart Lighting Including Motion Sensor



Wireless Smart Lighting

- 2,4 GHz network, 250 kbps
- High bandwidth, low latency
- Real-time RF Mesh network
- High security 128 AES encryption
- Light-on-demand (140 km/h)

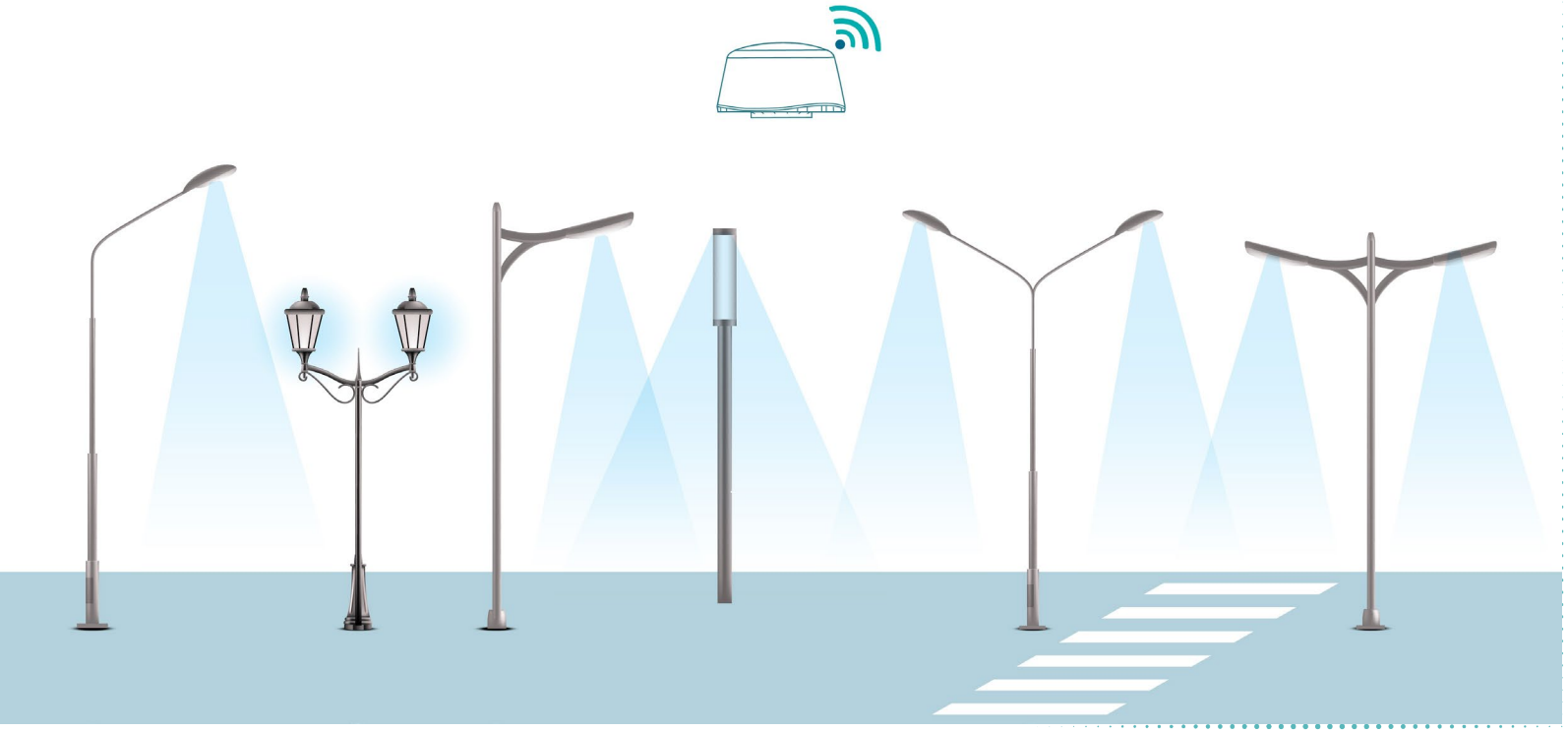
Zhaga RF Mesh Smart Street Light Controller



Zhaga RF Mesh IP65 DALI

- Remotely **monitor, manage** and **control** citywide streetlights
- **Plug & play installation** through standardised Zhaga book 18 socket and auto-commissioning system
- Uses self-forming, self-healing industry standard **RF mesh network**

Luminaire Agnostics, Vendor Neutral Solution



Freedom of Choice

- Select lamp fixtures from any suppliers / manufacturers.
- Prevent vendor lock-in. For example, fixtures from vendor 1 for main roads, while vendor 2 for the residential areas.
- Seamlessly connect and control any LED streetlight fixture / luminaire.

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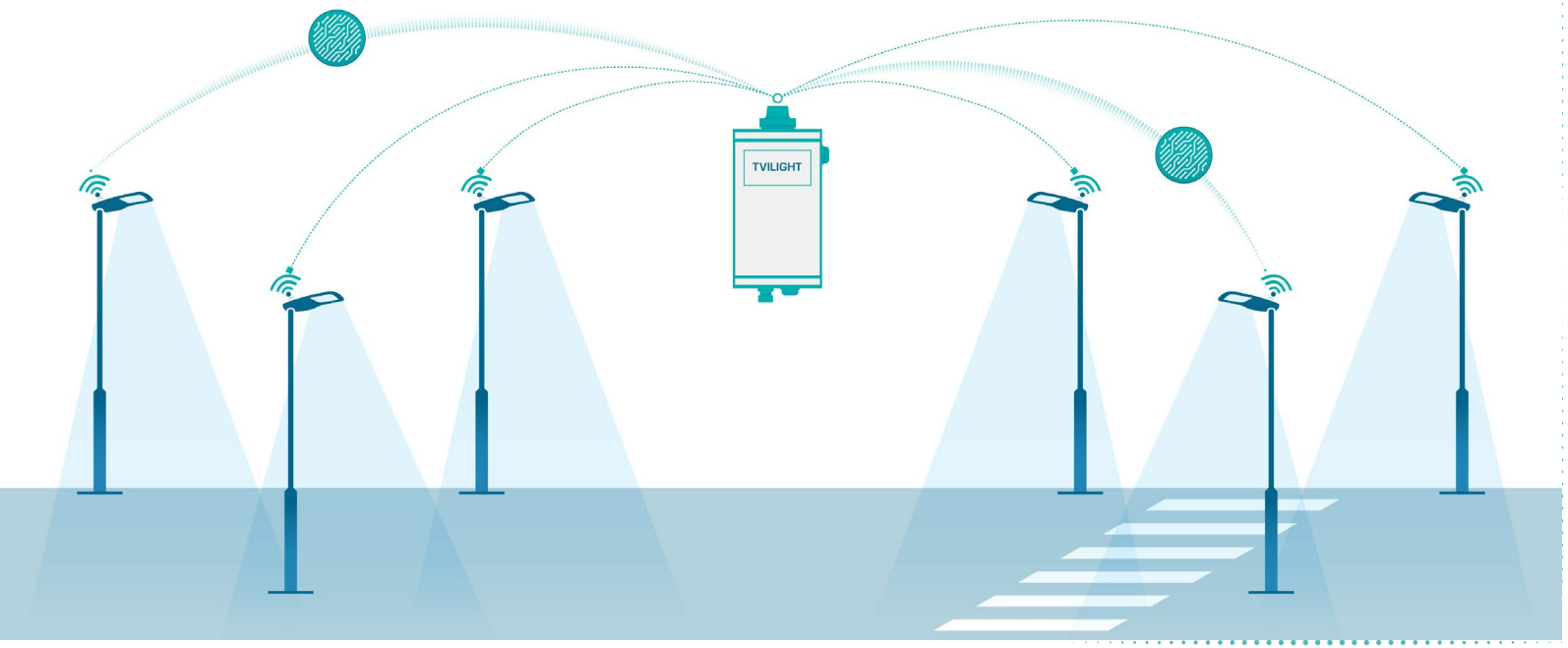
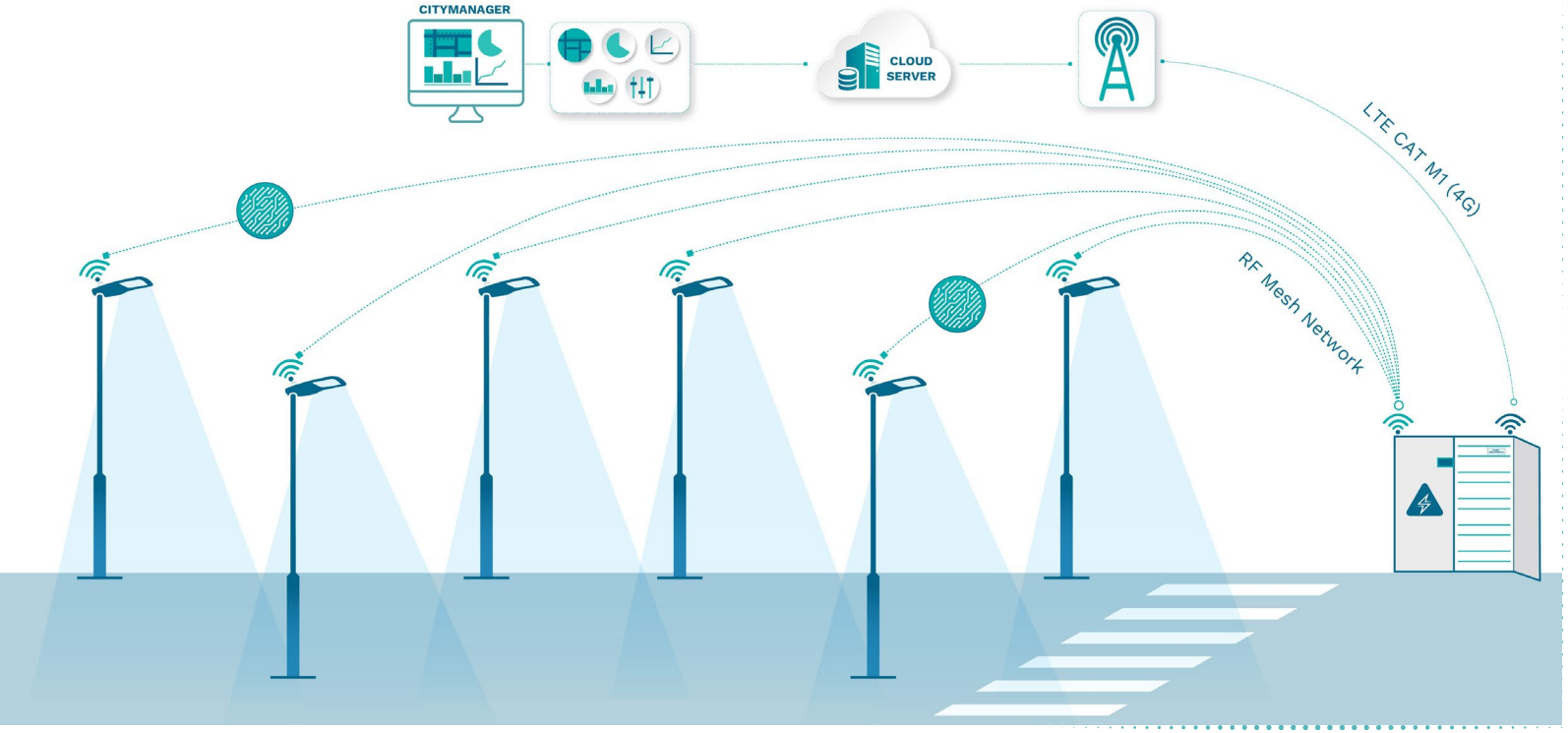
Secure Wireless Mesh Network



Secure communication over wireless network

- Self-forming and self-healing network
- Real-time communication
- Automatic Gateway connection
- Suitable for small and large areas alike
- IEEE regulated high encryption

Secure Wireless Mesh Network



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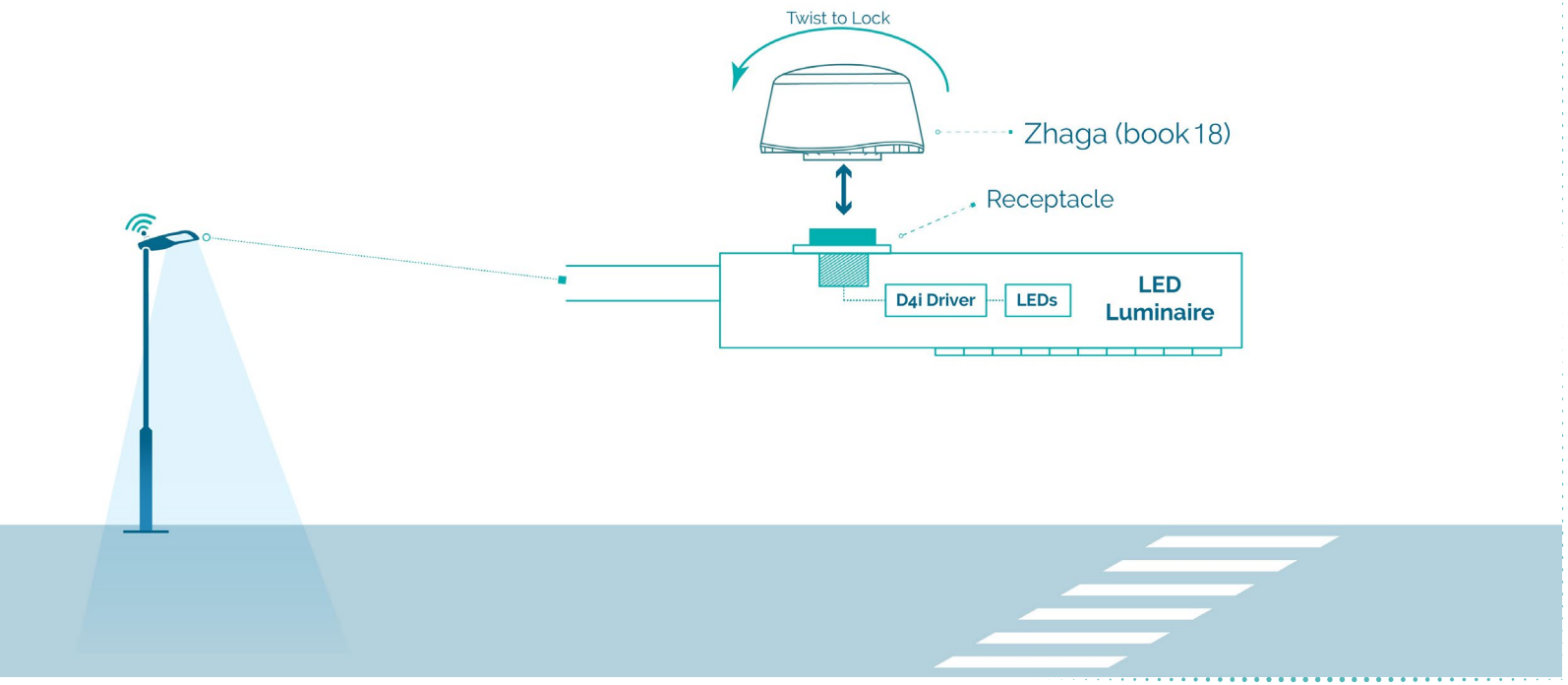
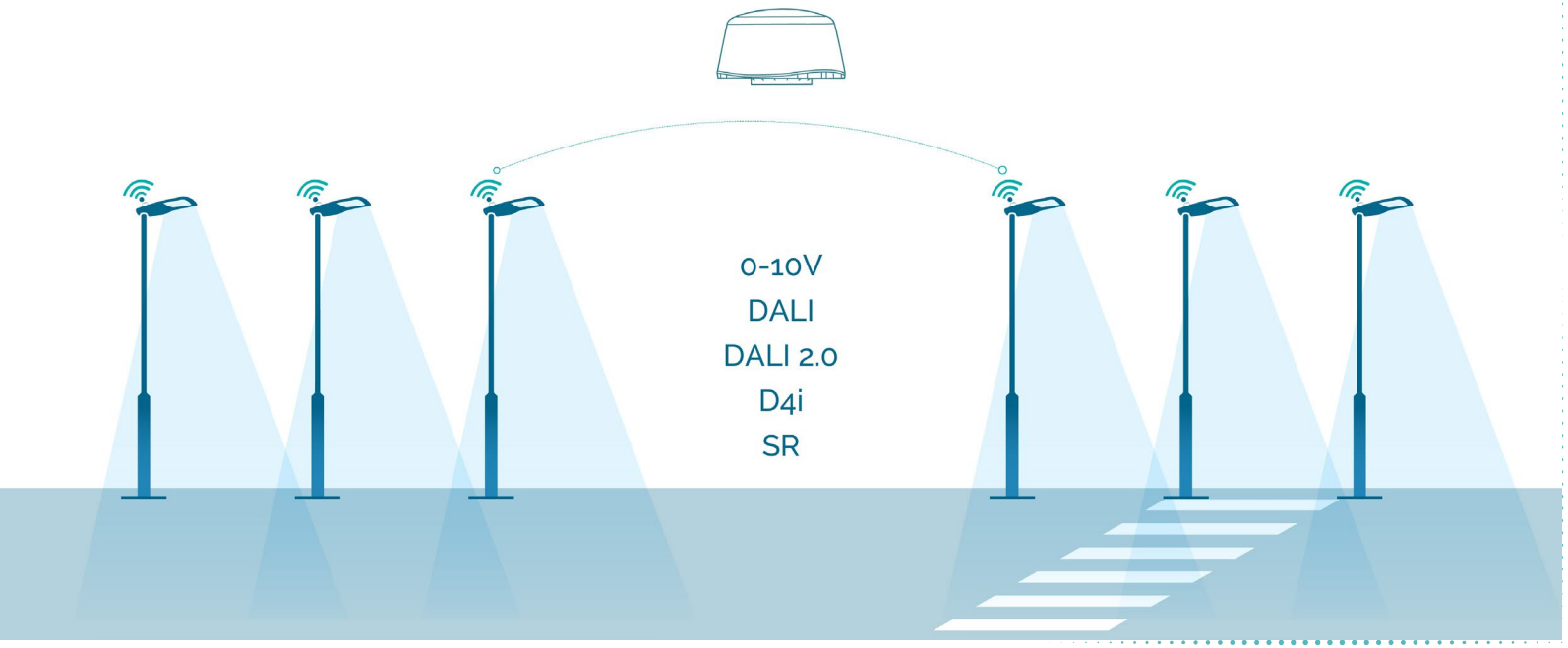
Quick and Tool-Free Installation



Standardised Zhaga Book 18 interface

- True plug-and-play installation
- No special training or tools needed
- Connects with any Zhaga-ready luminaire

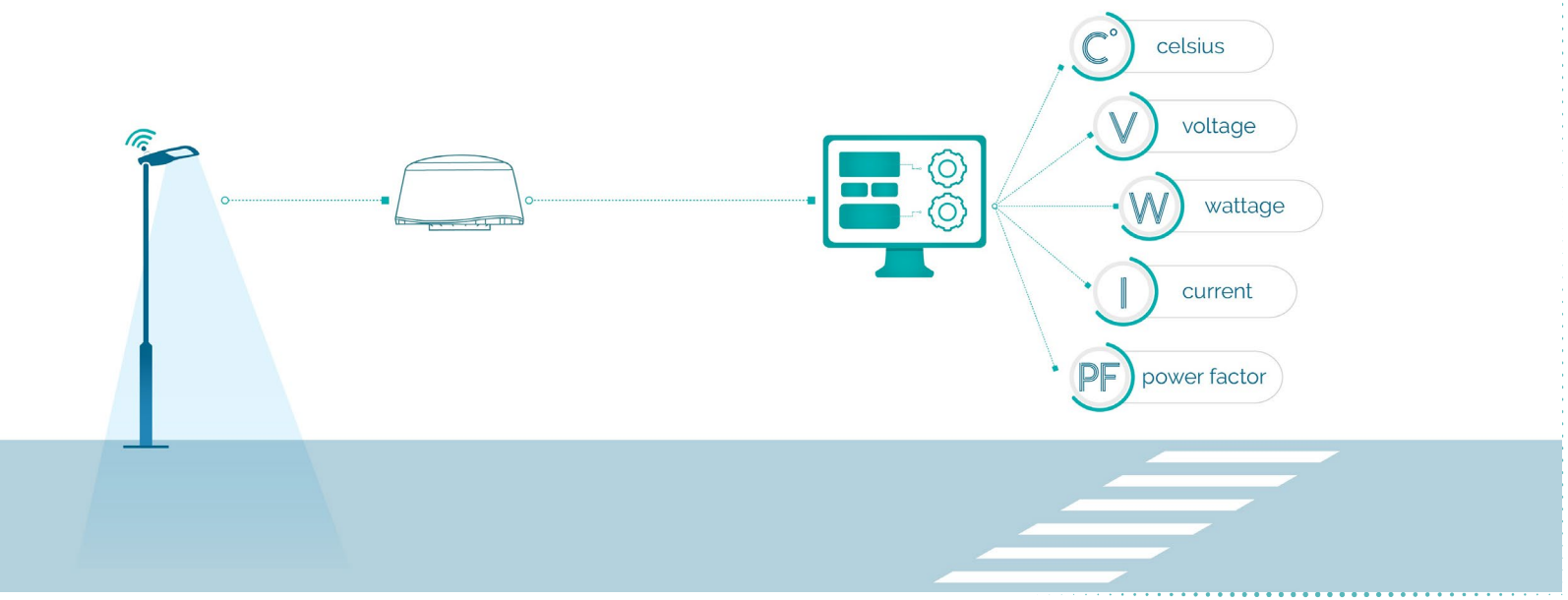
Flexible Dimming Control



Supports multiple dimming protocols

- 0-10V (analogue)
- DALI
- DALI 2.0
- D4i
- SR

Advance Health Monitoring Data



Achieve predictive maintenance

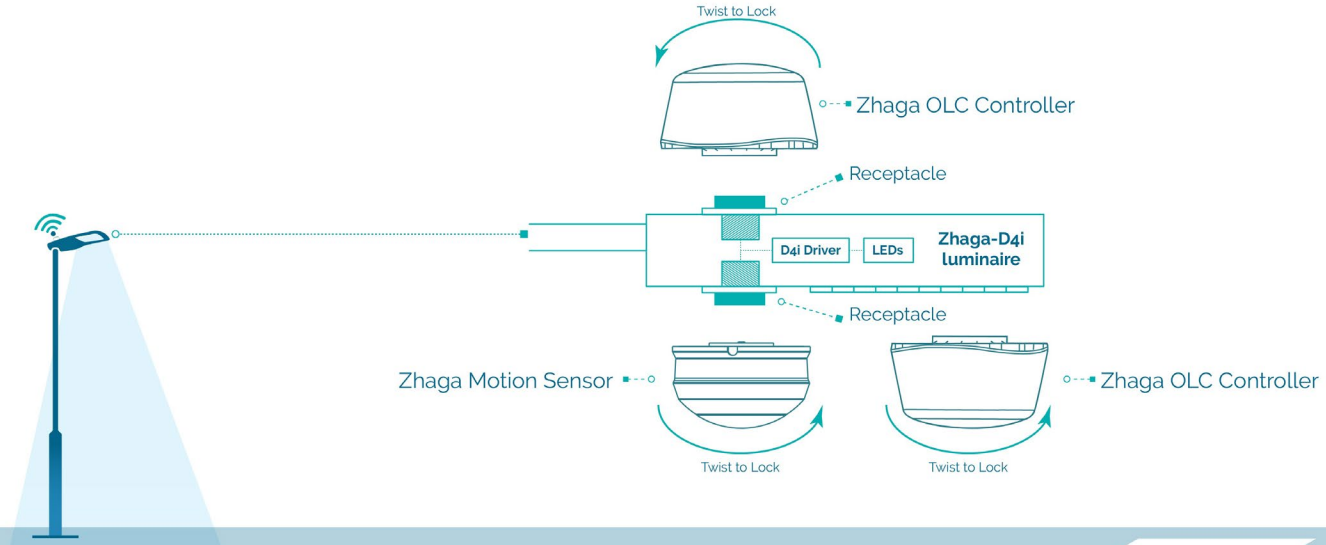
- Pairing Smart D4i Driver delivers advance luminaire, driver and power-grid data
- Data set includes driver temperature, input voltage/ power/ current/ power factor, etc.
- Notifications, alerts and error logs

Finer Control Over Dimming & Switching

Regulate light levels as situation demands

- Adaptive Lighting (Motion Sensor)
- Twilight (Photocell/ Ambient Light Sensor)
- Time-based Light Scene
- Autonomous
- AstroClock (Astronomical Clock)
- Calendar-based Schedules
- Central ALS (Photocells in City)
- Emergency (LightSwitch App)

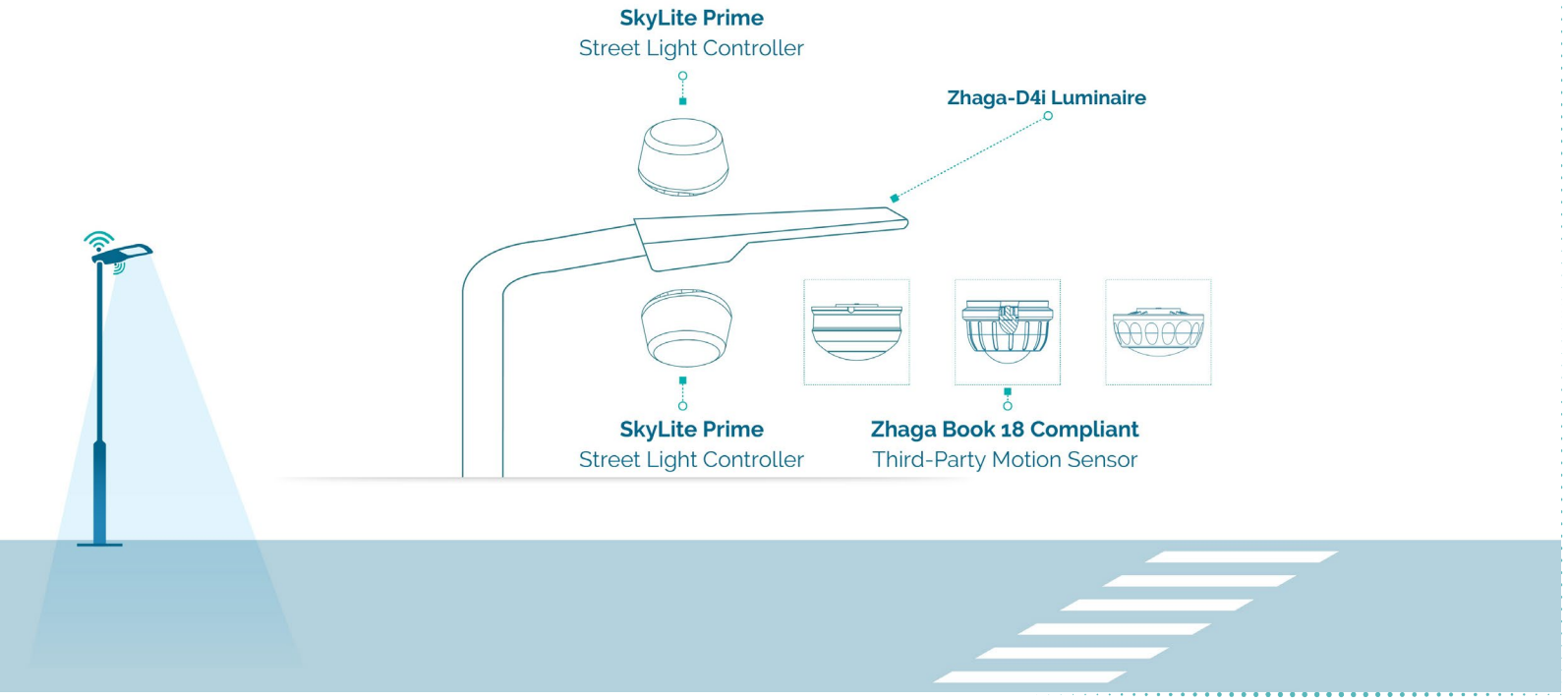
Zhaga RF: Top or Bottom Mounting



Easy setup

- For standalone setup, mount the controller as per your liking – top or bottom of the luminaire
- For the adaptive lighting configuration, mount the controller on the top and Zhaga motion sensor on the bottom

Zhaga RF: Top or Bottom Mounting



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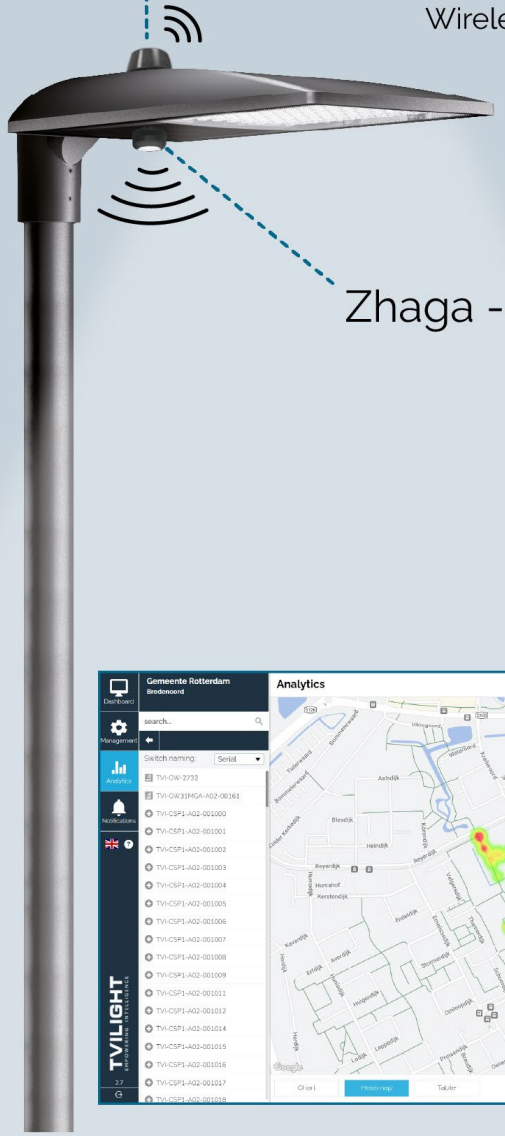
SkyLite Prime

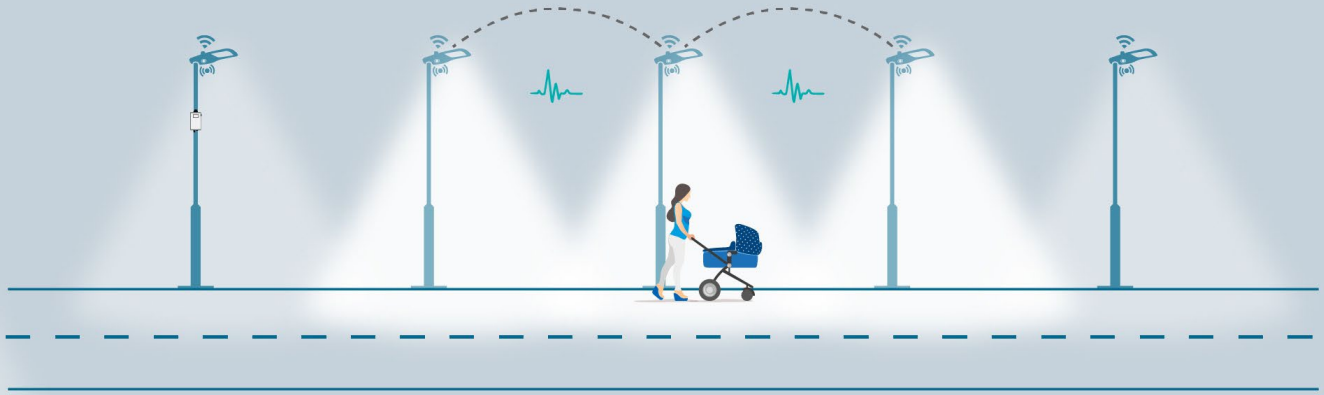
Wireless Zhaga Controller



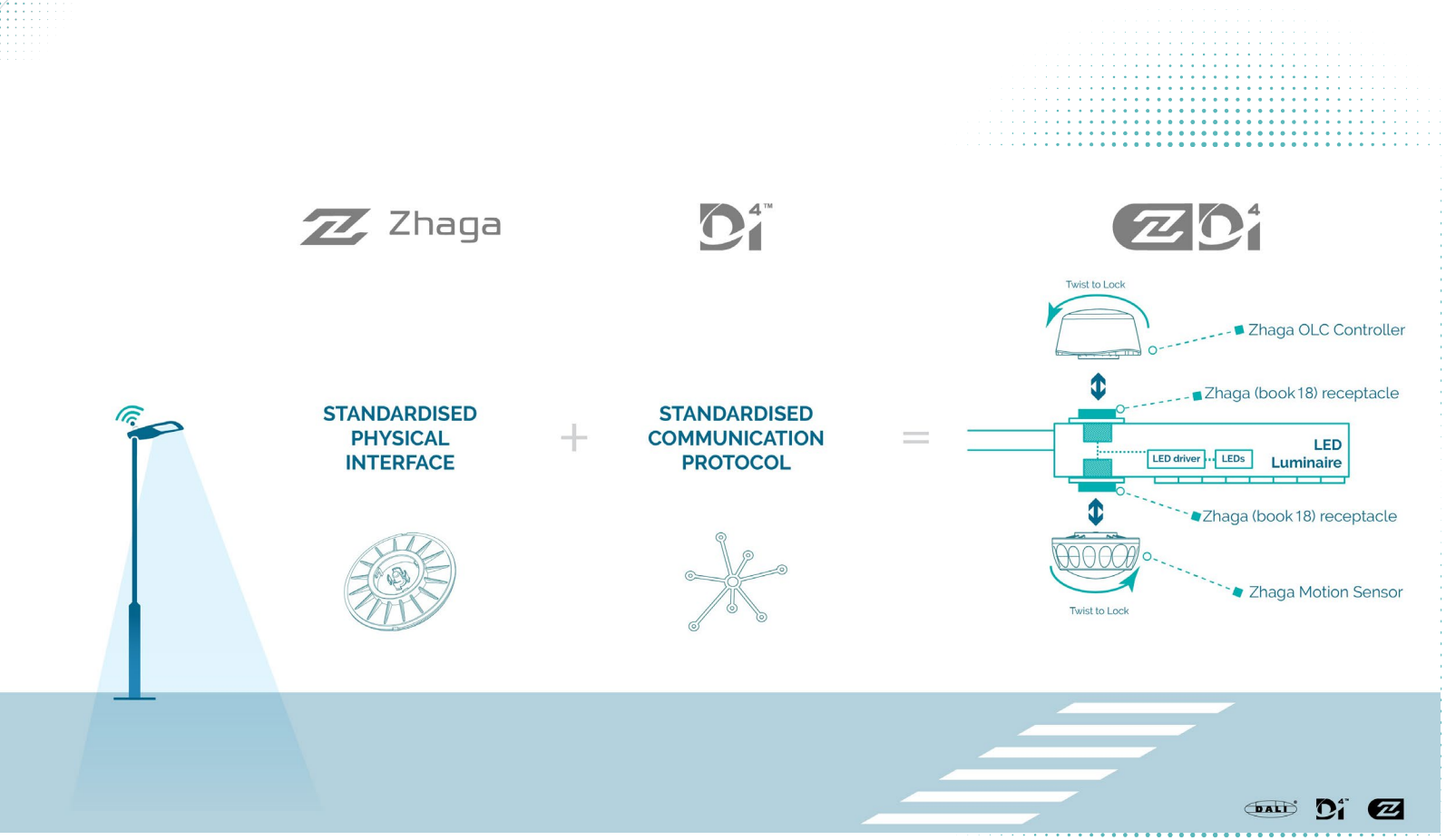
Zhaga - D4i Motion Sensor

CitySense Lite

- True Light-on-Demand
- Open API Interface
- Smart Heatmaps



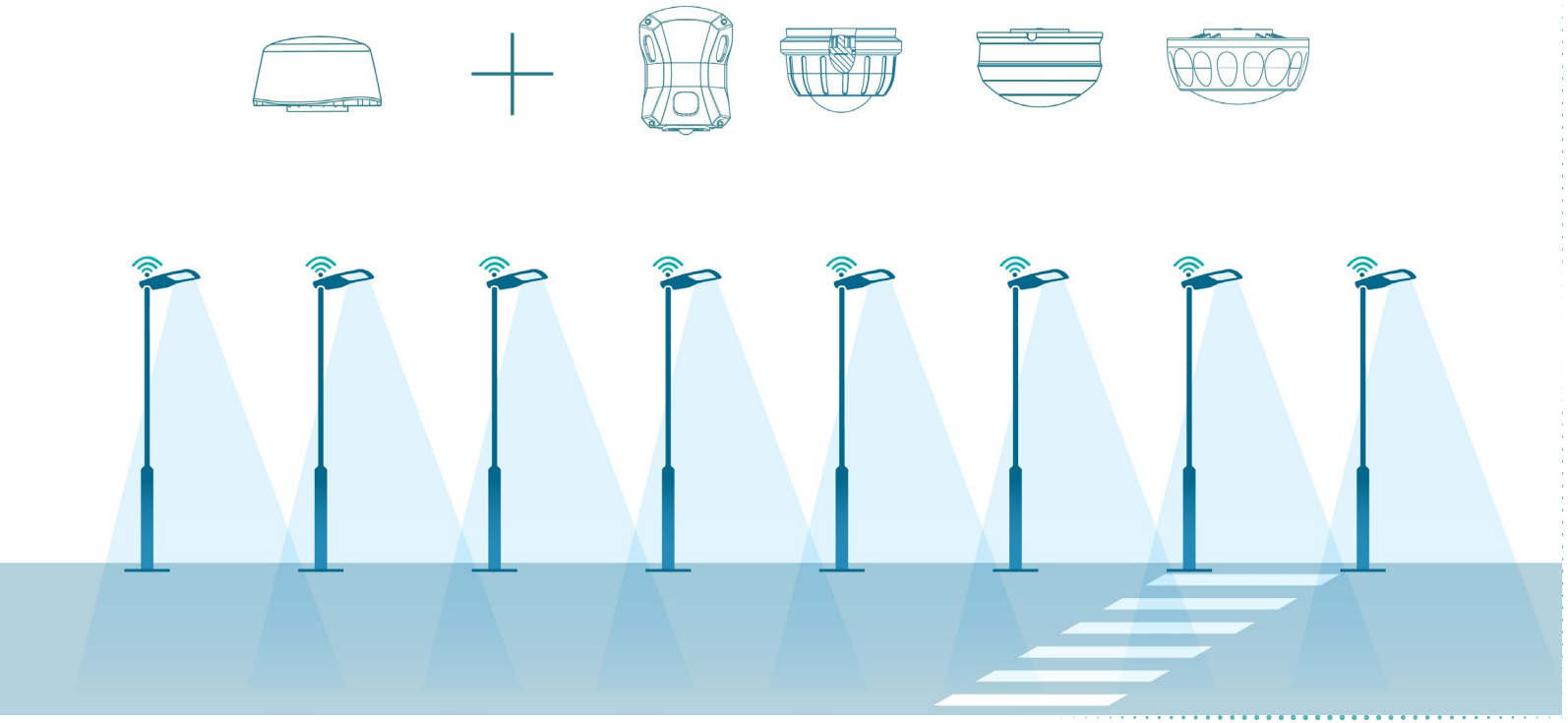
Interoperable – No Vendor Lock-in



Open architecture enables excellent interoperability

- Select any Zhaga street light fixture of your choice
- Use multiple vendors in a single project
- Integrate any D4i or LSI based motions sensors

On-Demand Adaptive Lighting



Connects with any DALI D4i and LSI-based motion sensor

- Motion sensors improve public safety perception
- Suitable for pedestrian, bicyclist and road traffic
- Swift communication over wireless mesh network enables real-time neighbour trigger / follow light

Safe Circle-of-Light – Automatic Neighbour Trigger

Experience true light-on-demand

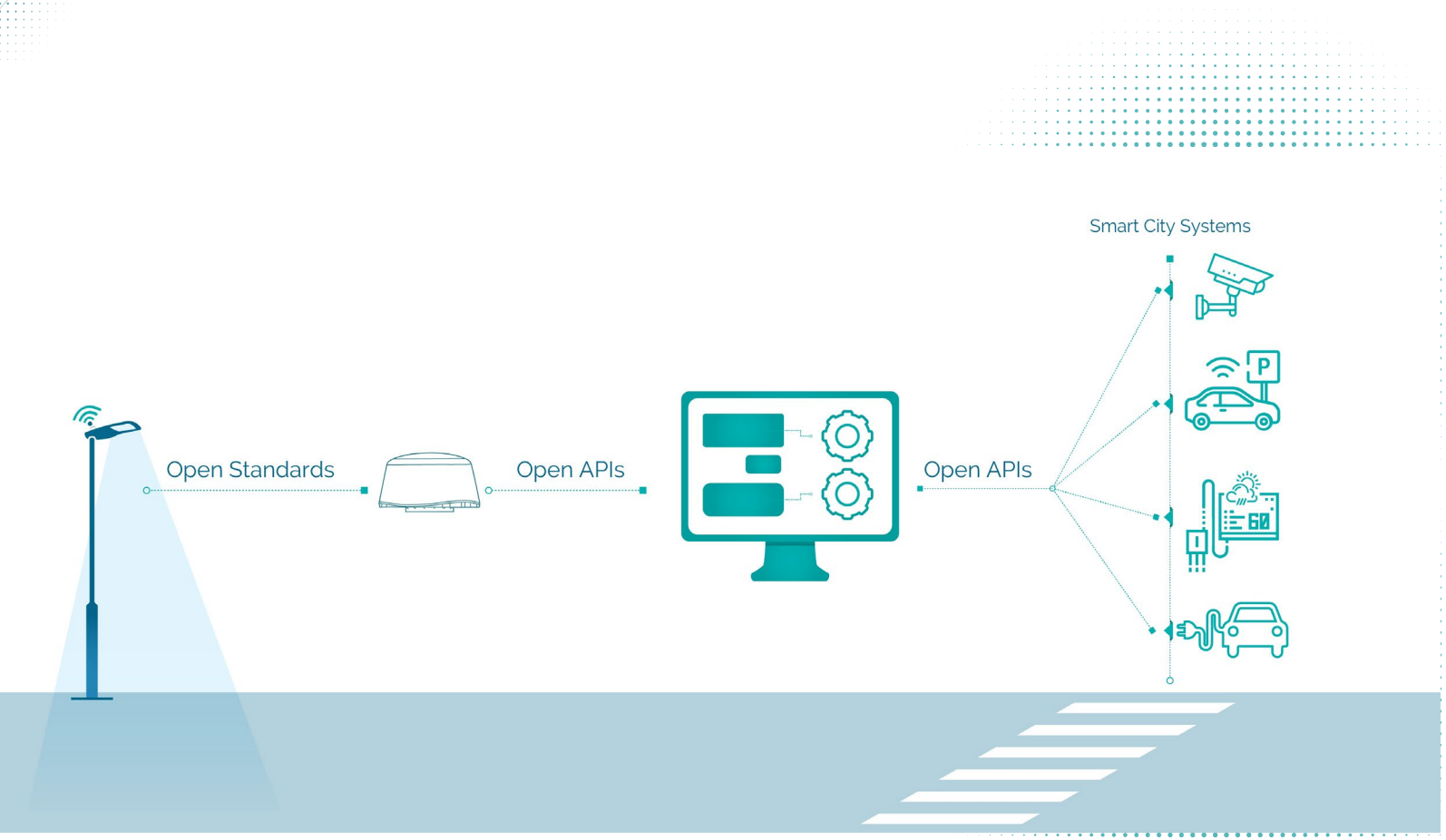
- Road users drive through a safe circle-of-light
- Motion sensing enhances public safety perception
- Achieves 60% - 90% energy savings
- Significant reduction in carbon footprint and light pollution
- Benefits local flora and fauna

Visualise Road Usage with Heatmaps

Understand how citizens are using the roads

- Pairing motion sensors helps generate heatmaps to:
  - Measure people's movement
  - Identify areas and spots that are popular at different times
  - Spot trends and patterns to adjust street lighting levels based on road usage data

Smart City Ready



Built on Open Standards & APIs

- Works with a range of IoT and Smart City systems
- Selected examples:
  - Cisco Kinetics
  - Siemens Atos
  - SixData luxData.light
  - Osram Lumldent

Features to Improve Day-to-Day Operations...

Automatic

Integrated photocell (twilight sensor) enables streetlight switching based on the naturally available ambient light

Programmable

Program streetlights as situation demands. Control when, where and how the streetlights turn ON or OFF

Timely Notifications

Receive all updates about your street lighting infrastructure via email and CityManager platform

Features to Improve Day-to-Day Operations...

Fail-Proof

Inbuilt multilevel backup system ensures lights go to their standard (predefined) mode in case of unlikely failure

Over-the-Air Updates

Thanks to the faster communication with the device, software updates take place in matter of minutes

IP65 + UV Stabilised

IP65 and UV stabilised housing protects the device in the harsh environment and ensures prolonged life

Business Case – Dortmund, Germany

Overview:

- Location: Germany
- Client: City of Dortmund
- Status: 44.000 full operational smart street lights

Major Results & Benefits:

- Energy Savings: An average 65% every night
- CO2 Reduction: 1757 tonnes in 6 months
- Enhanced Safety: Improved public and traffic safety with precise illumination
- Cost Efficiency: Reduced maintenance costs through proactive fault alerts
- Smart City Ready: Open standards and APIs allow easy integration and future expansion

Partners:

TRILUX SIMPLIFY YOUR LIGHT. LUNUX DEW21 SPIE

"I can wholeheartedly recommend this lighting system to other cities," **Mr. David Obenaus, DEW21**

"The system fully meets and exceeds the original vision and requirements," **Mr. Meinolf Pflug, Dortmund Civil Engineering Office**

Business Case – Olympia Odos, Greece

Overview:

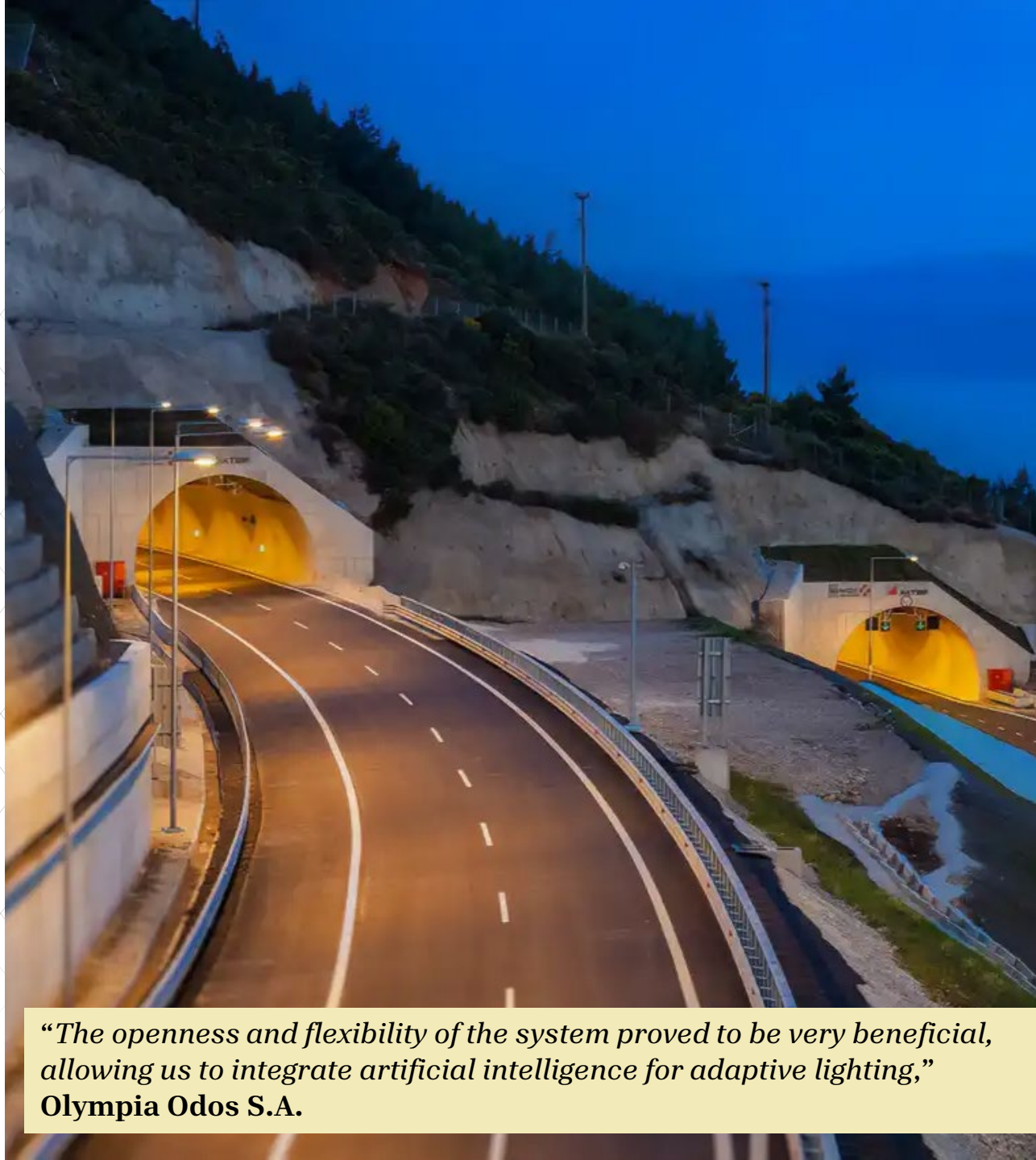
- Location: Greece
- Client: Olympia Odos
- Status: 215 km highway, connecting Athens and Patras, has smart AI-driven street lights deployed which adapt illumination based predicted traffic and weather conditions

Major Results & Benefits:

- Energy Savings: 54% energy savings
- CO2 Reduction: Over 1702 tonnes of CO2 reduced in the last 6 months
- Enhanced Safety: Artificial intelligence ensure optimal light levels based on predicted traffic and weather conditions, boosting safety for drivers
- Cost Efficiency: Remote monitoring and control capabilities from the Tvilight's light management platform enabled efficient maintenance practices, ensuring reduced downtime and overall associated costs
- Future Ready: Open API-based solution opens endless possibilities for the client to integrate various IoT systems to make the motorway safe and modern yet sustainable

Partners:

sielight VINCI



"The openness and flexibility of the system proved to be very beneficial, allowing us to integrate artificial intelligence for adaptive lighting," **Olympia Odos S.A.**

Business Case – Dutch Railways

Overview:

- Location: the Netherlands
- Client: ProRail
- Status: 10.000 platform lights, across 400 stations are equipped with motion sensors and are fully operational

Major Results & Benefits:

- Energy Savings: Over 40% energy savings
- CO2 Reduction: Nearly 94 tonnes in 6 months
- Enhanced Safety: Adaptive lighting increases safety for passengers and railway personnel
- Reduced Light Pollution: Positive impact on nearby residents and wildlife
- Cost Efficiency: Proactive maintenance with remote monitoring reduces costs

Partners:

Strukton van doorn LIGHTING

"We wanted to achieve a few things – lowering energy usage and lighting pollution while ensuring public safety. Tvilight's solution combined this beautifully," **Eelco Krakau, Contract Manager, Prorail**

"Motion sensor street lighting aligns perfectly with our sustainability goals. It's been instrumental in reducing our carbon footprint, making our stations eco-friendly." **Maurits Pigeaud, Systems Engineer**

Business Case – Münster, Germany

Overview:

- Location: Germany
- Client: City of Münster
- Status: All street lights on a 27 km bicycle path are equipped with motion sensors and are fully operational

Major Results & Benefits:

- Energy Savings: Over 70% reduction in energy usage
- CO2 Reduction: Significant decrease in carbon footprint
- Enhanced Safety: Optimal illumination for cyclists and pedestrians, when and where needed
- Environmental Impact: Reduced light pollution, benefitting nocturnal ecosystem
- Recognition: Winner of German Bicycle Prize for Infrastructure

Partners:

LUNUX

"The system is very sustainable, and we also have less light emission, which excellently results in protecting the animal world," **Andreas Groot-Kormelink, Office for Mobility and Civil Engineering of the City of Munster**

"I actually go jogging every other day – and I've stumbled quite a few times. At least now I can see where I'm running. That's really nice," **One of the locals**

Business Case – Helmond, the Netherlands

Overview:

- Location: the Netherlands
- Client: Municipality of Helmond
- Status: 10.000 controllers and sensors across main and secondary roads, pedestrian and bicycle paths, residential areas, university and automotive campuses are deployed and fully functional

Major Results & Benefits:

- Energy Savings: Nearly 70% energy savings
- CO2 Reduction: Over 310 tonnes of CO2 reduced in the last 6 months
- Enhanced Safety: Improved overall safety with optimal illumination
- Environmental Impact: Reduced light pollution, benefitting citizens as well as nocturnal ecosystem
- Smart City Ready: Open API enables the city to incorporate diverse IoT applications to support smart city needs
- Cost Efficiency: Reduction in operating and maintenance costs thanks to precise control over lighting infrastructure and automatic fault notifications and luminaire health data

Partners:

heijmans

"Motion-sensing street lighting helps, because it allows to have just as much or as little light as needed. With Tvilight, Helmond preserves citizen safety with maximum energy savings," **Alfred Groote, Public Lighting Manager at the Municipality of Helmond**

Business Case – Chattogram, Bangladesh

Overview:

- Location: Bangladesh
- Client: Chattogram City Corporation
- Status: 4.800 smart controllers operational and potential project extension for 20.600 light points

Major Results & Benefits:

- Energy Savings: Over 30% energy savings
- CO2 Reduction: Over 90 tonnes of CO2 reduced in the last 6 months
- Enhanced Safety: Smart profiles and built-in ALS sensors ensure the streets remain well-lit always, boosting safety for public
- Cost Efficiency: Reduced maintenance costs thanks to total control over the public lighting infrastructure and proactive fault alerts from the system
- Smart City Ready: Open API-based solution lays a solid foundation the municipality to move towards its Smart City goals

Partners:

Trademajestic Limited

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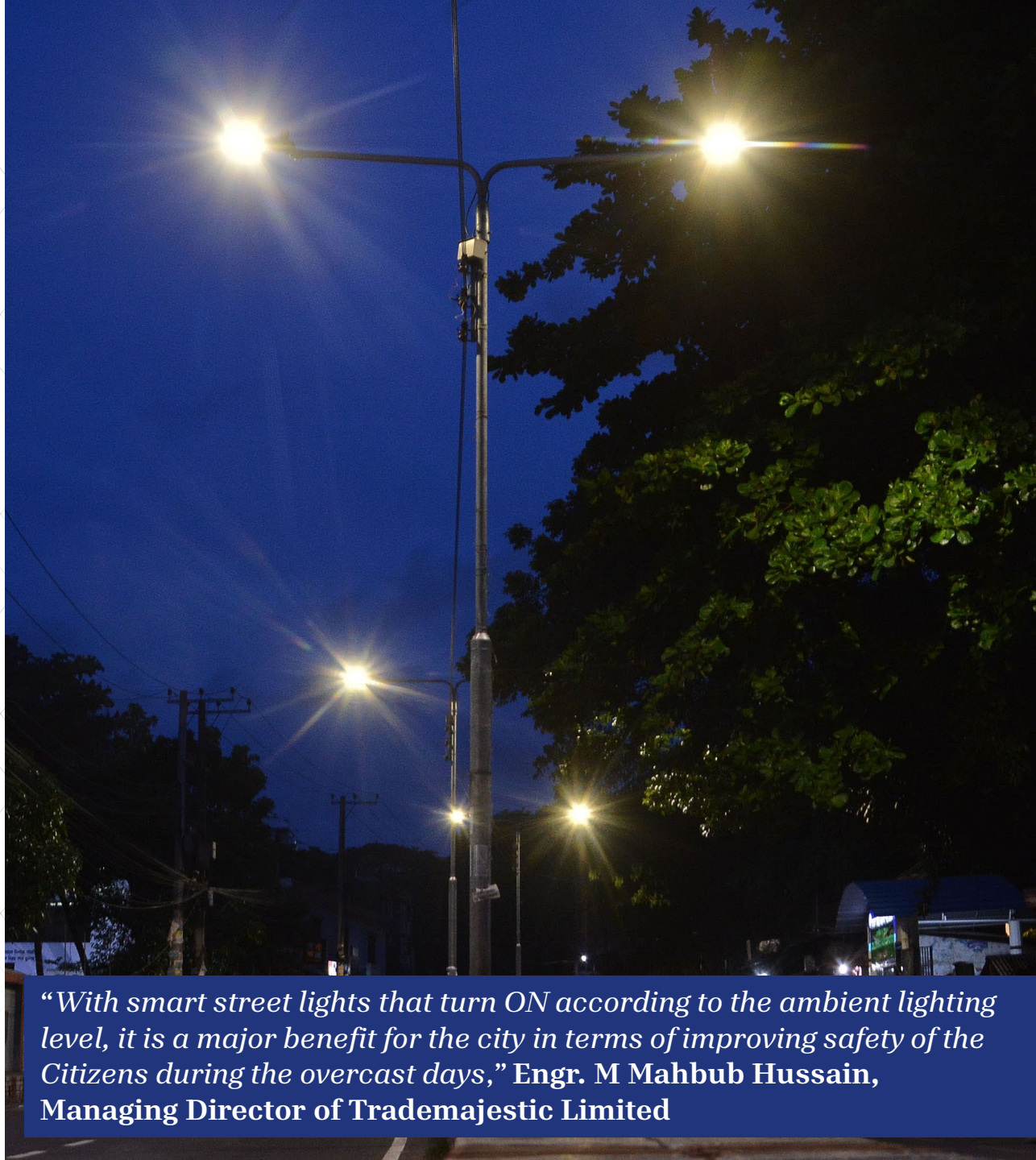

"With smart street lights that turn ON according to the ambient lighting level, it is a major benefit for the city in terms of improving safety of the Citizens during the overcast days," **Engr. M Mahbub Hussain, Managing Director of Trademajestic Limited**

Business Case – Jaipur, India

Overview:

- Location: India
- Client: Jaipur Development Authority (JDA)
- Status: 7500+ IoT and RF Mesh motion sensor-based smart street lights deployed across the city, including the urban and rural areas

Major Results & Benefits:

- Energy Savings: 55% energy savings
- CO2 Reduction: Over 487.8 tonnes of CO2 reduced in the last 6 months
- Enhanced Safety: The solution ensured consistent illumination, improving safety and deterring unwanted activities
- Cost Efficiency: CityManager and a special request Citizen App from Tvilight, streamed streetlight management, reducing frequent manual inspections and accelerating maintenance response, lowering operational costs
- Future-Proof Investment: Scalable solution enables Jaipur well-prepared for future growth, including total freedom to integrate other smart city applications

Partners:

"Our city is benefiting in every aspect – from safety and security, to easy access to information, to overall improvement of our image and a stepping into the "Smart City" arena.," **Shikhar Agrawal, Government of Rajasthan**

Selected Case Studies

Motion Sensor Smart Street Lighting in Belgium

Learn more

Light on demand at Sohar Port & Freezone, Oman

Learn more

Largest Sensor-based Smart Lighting Project in India

Learn more

Selected Case Studies

Starry Night on the Island of Texel, NL

Learn more

Intelligent Lighting at famous Van Gogh village, NL

Learn more

On-Demand Lighting in Park space, NL

Learn more

Selected Case Studies

Adaptive Street Lighting Across Dutch Train Stations

Learn more

Adaptive Lighting Enhances Cycling Experience, DE

Learn more

Solar Street Lights with Motion Sensors, Middle East

Learn more

Like it.

Why not give it a try?

Want to learn more?

Need datasheet?

Contact us at: sales@tvilight.com

Thank You

We look forward to working with you!

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