Capital Digital

MADRID

EUI Valdemingómez

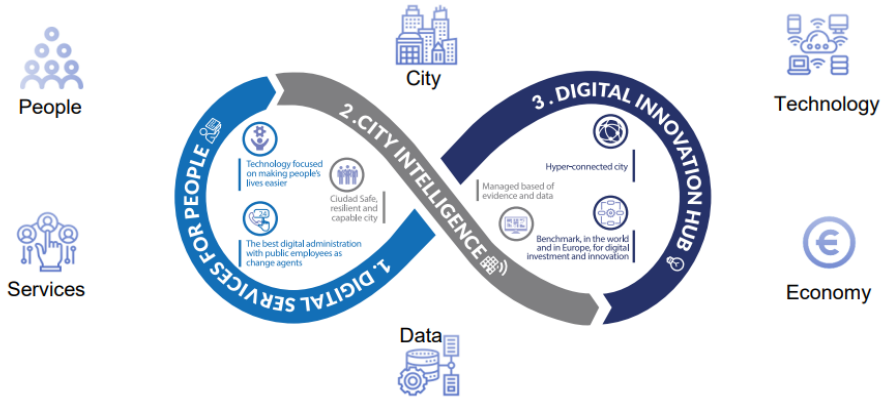
IoT para la Gestión Inteligente de Residuos Urbanos

Guillermo del Campo

IOTMADLAB TECHNICAL DIRECTOR
UNIVERSIDAD POLITECNICA DE MADRID

SMARTCITY
EXPO WORLD CONGRESS

MADRID, DIGITAL CAPITAL – CITY INTELLIGENCE



Strategic objective 2: *City Intelligence*

In order to boost this strategic objective, the City of Madrid has various enabling and driving projects for transformation, structured in the two strategic axes:

Strategic axis 3:

Safe, resilient and capable city

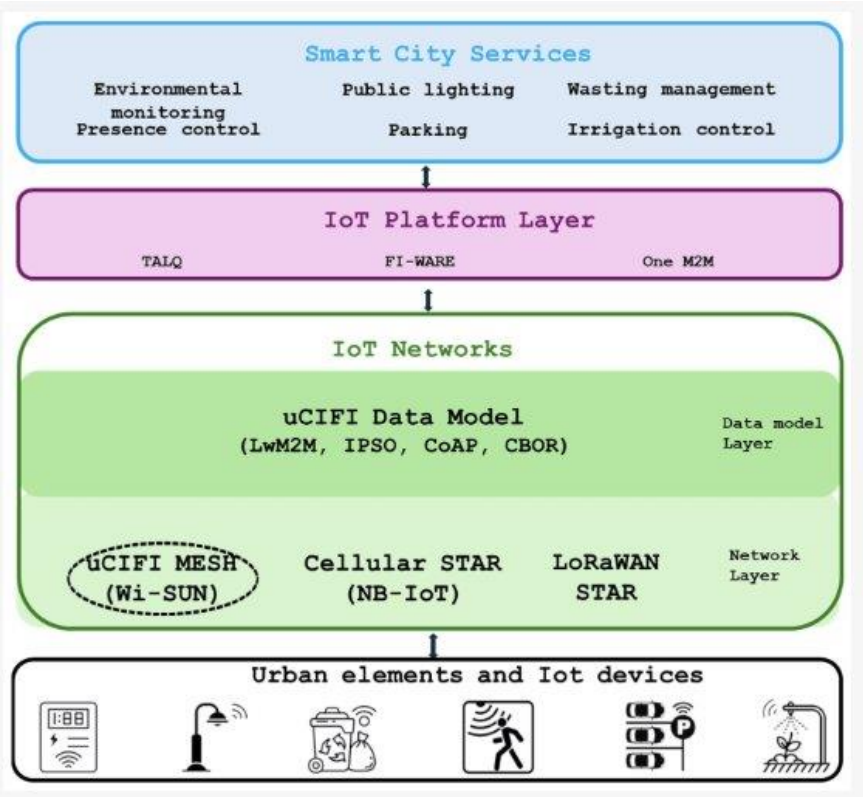
Program 5. *SUSTAINABLE AND DIGITAL INTELLIGENCE FOR MANAGEMENT*

★ Digital urban spaces

CONTEXT

- Valdemingómez Technology Park (PTV) is the main waste management facility of Madrid city.
- The Smart Urban Space (EUI) includes Visitors Center and Los Cantiles composting plant.
- Variable activities: truck traffic, waste unloading, compost handling, and public visits.
- Goal: energy-efficient and adaptive lighting that adjusts to real-time environmental conditions and human activity patterns

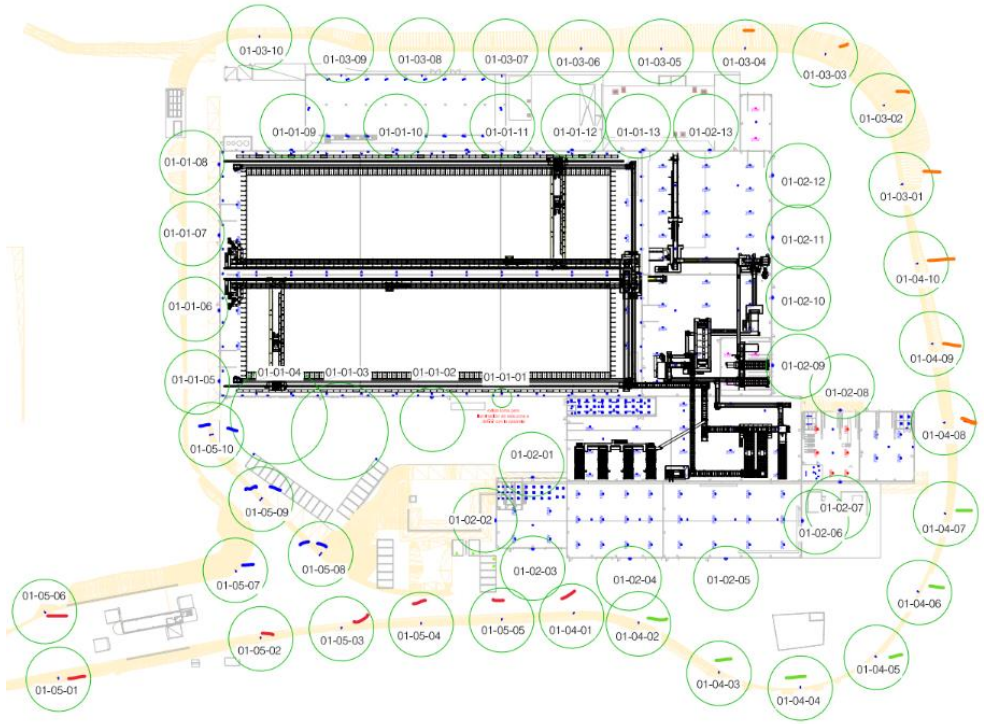
IOT NETWORK REFERENCE ARCHITECTURE



Object Name	ID	Instances	Object URN
Temperature Sensor	3303	Multiple	urn:oma:lwm2m:ext:3303

Resource	ID	Oper.	Mandatory	Type	Units	Description
Sensor Value	5700	R	Mandatory	Float	Defined by "Units" resource	Current measured sensor value
Min Measured Value	5601	R	Optional	Float	Defined by "Units" resource	The minimum value measured by the sensor since power ON
Max Measured Value	5602	R	Optional	Float	Defined by "Units" resource	The maximum value measured by the sensor since power ON
Min Range Value	5603	R	Optional	Float	Defined by "Units" resource	The minimum value that can be measured
Max Range Value	5604	R	Optional	Float	Defined by "Units" resource	The maximum value that can be measured
Sensor Units	5701	R	Optional	String		Measurement units definition e.g. "Cel" for celsius
Reset Min and Max Measured Values	5605	E	Optional	String		Reset the min and max measured values to current value

LIGHTING INFRASTRUCTURE



FABRICANTE	
Denominación Social:	Schréder
Dirección física:	SCHRÉDER SOCELEC SA Pol. Ind. El Henares – Av. Roanne 66 19180 Marchamalo (Guadalajara), España +34 9 49 32 50 80
Página WEB:	https://sp.schreder.com/es
Mail de contacto:	mailto://comercialspain@schreder.com
EQUIPO	
Clasificación:	Luminaria viaria > Luminarias Post-top
Denominación:	IZYLUM
Referencia comercial:	
Versión / fecha de comercialización:	
Imagen	
URL del producto:	https://sp.schreder.com/es/productos/iluminacion-led-exterior-izylum
Características:	Altura recomendada para la instalación: 4 – 15 m. Temperatura de funcionamiento: -40ºC a +55ºC. Módulo de LEDs: 40 LEDs.
Sensores:	Como miembro fundador del consorcio Zhaga, Schréder ha participado en la creación del programa de certificación Zhaga-D4i y en la iniciativa de este grupo para estandarizar un ecosistema interoperable.
ANEXO I: CHECKLIST LUMINARIA	
Conector Zhaga superior	Sí
Conector Zhaga inferior	Sí
Protocolo Dali4	Sí
Alimentación	220 – 240 V
Control con nodo IoT	Sí
Control con sensor PIR	Sí
Descubrimiento en Plataforma IoT	Sí
Apertura sin herramientas	Sí

IOT DEVICES

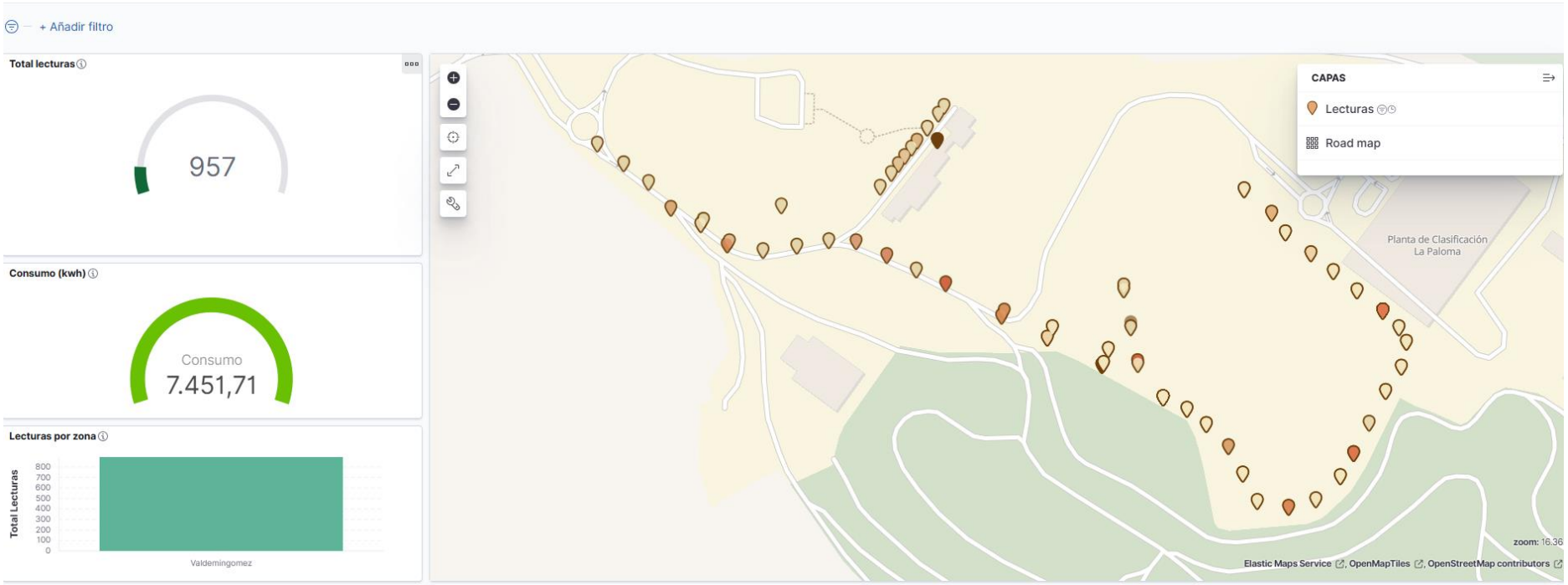
- 60 LED luminaire controllers, each capable of adjusting brightness levels dynamically.
- 10 PIR sensors for motion detection.
- 15 parking occupancy sensors for monitoring vehicle presence.
- Several environmental sensors, including noise, temperature, humidity, air quality, flood, rain, and UV radiation sensors.
- Electricity consumption meters to validate energy consumption as result of the smart lighting system.

SMART CONTROL LOGIC

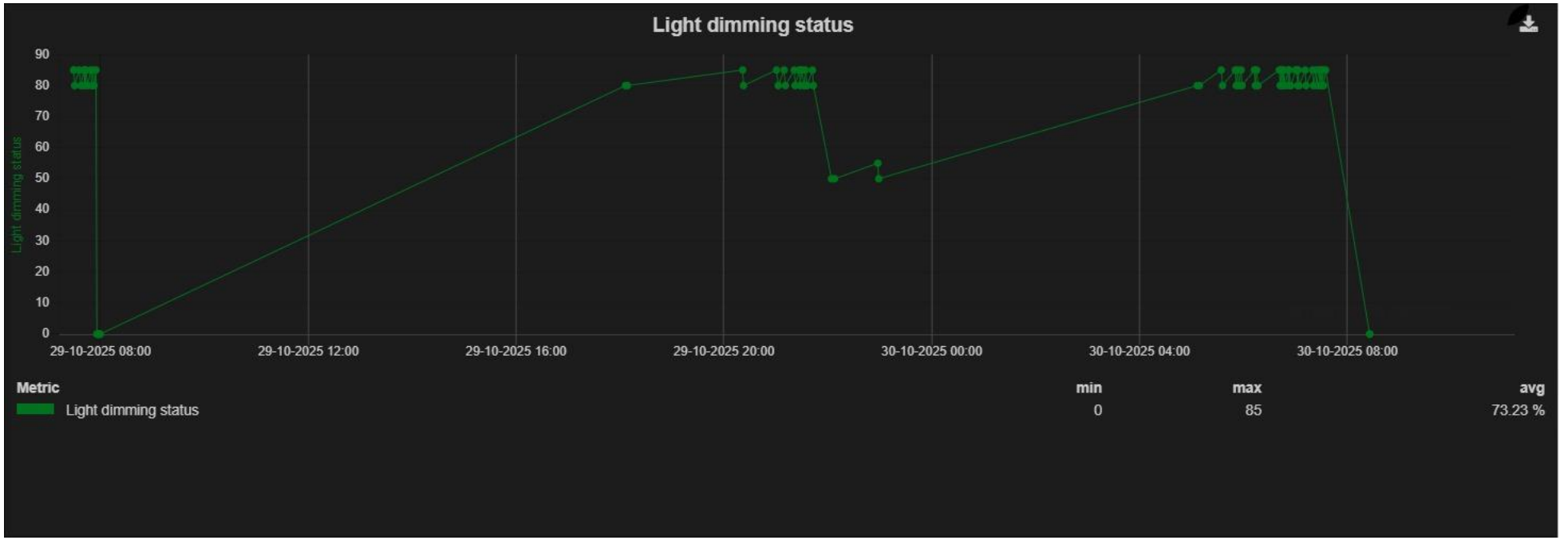
- **Adaptative lighting**
- Motion-based adaptation
- Environmental adaptation
- Parking optimization

- **Data driven platform:**
- Characterize the daily and nightly activity of the plant.
- Identify high-traffic zones and optimize illumination schedules accordingly.
- Enable predictive maintenance and energy-use optimization.

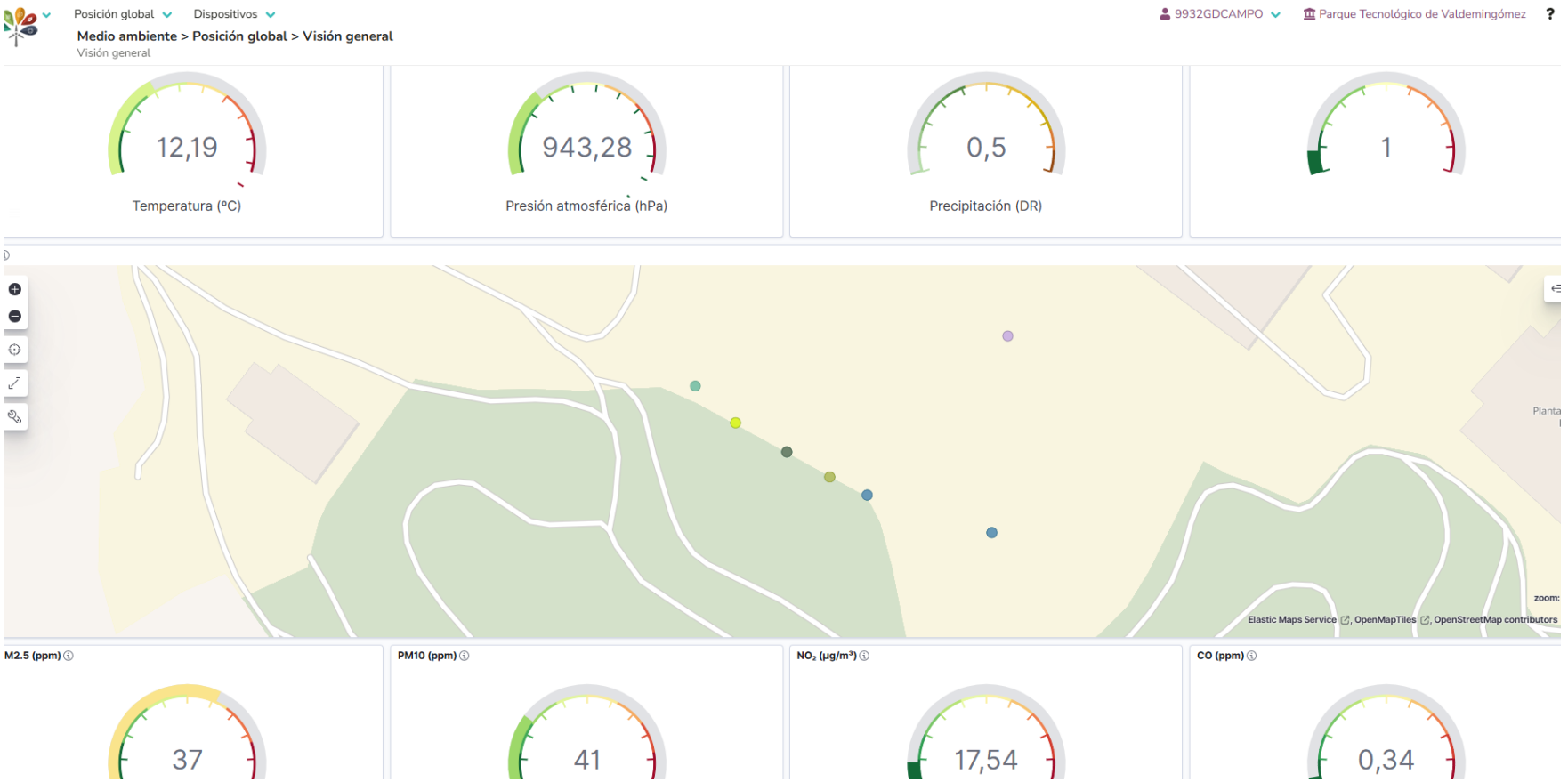
LIGHTING


+ Añadir filtro
Total lecturas
957
Consumo (kwh)
Consumo
7.451,71
Lecturas por zona
Total Lecturas
800
700
600
500
400
300
200
100
0
Valdemingomez
CAPAS
Lecturas
Road map
Planta de Clasificación
La Paloma
zoom: 16.36
Elastic Maps Service, OpenMapTiles, OpenStreetMap contributors

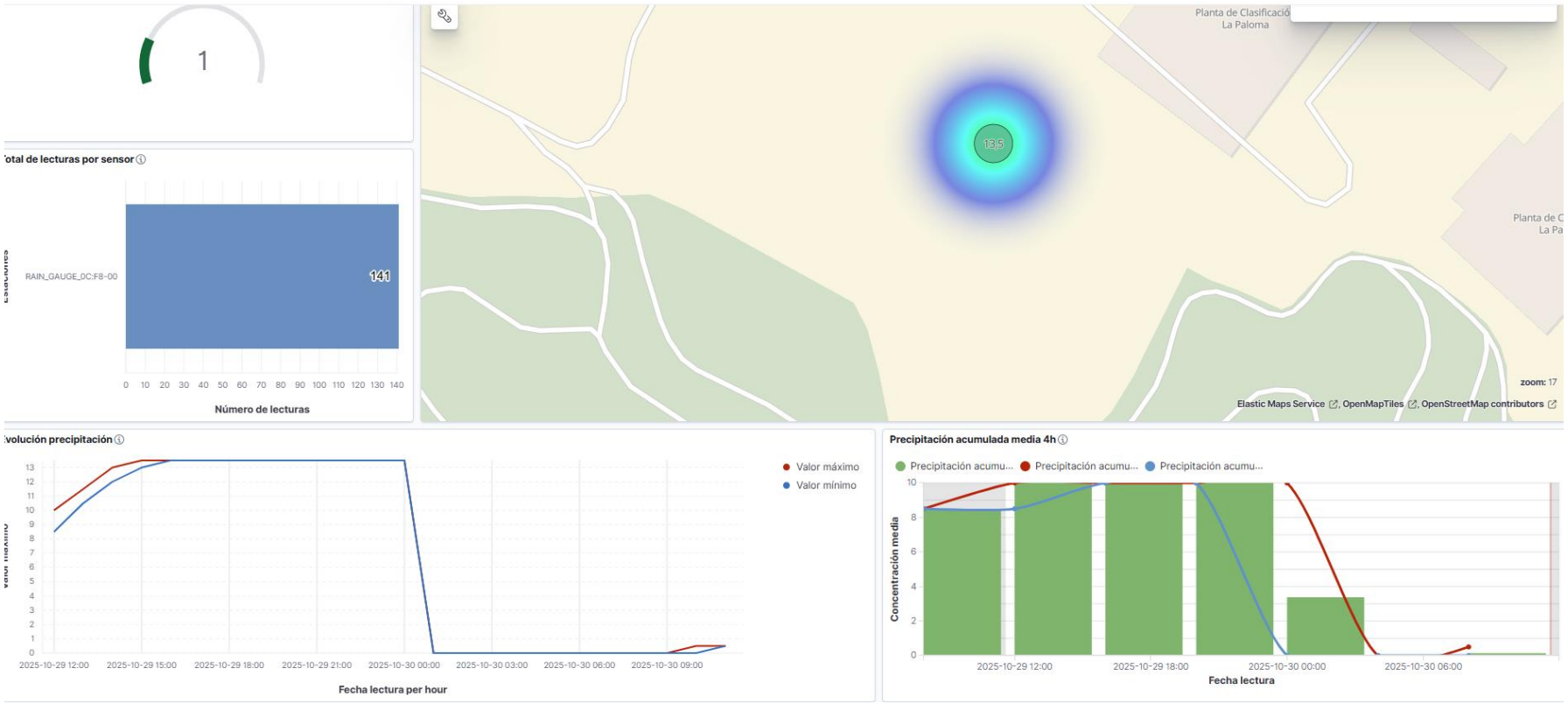
LIGHTING


Light dimming status
90
80
70
60
50
40
30
20
10
0
Light dimming status
29-10-2025 08:00
29-10-2025 12:00
29-10-2025 16:00
29-10-2025 20:00
30-10-2025 00:00
30-10-2025 04:00
30-10-2025 08:00
Metric
min
max
avg
Light dimming status
0
85
73.23 %

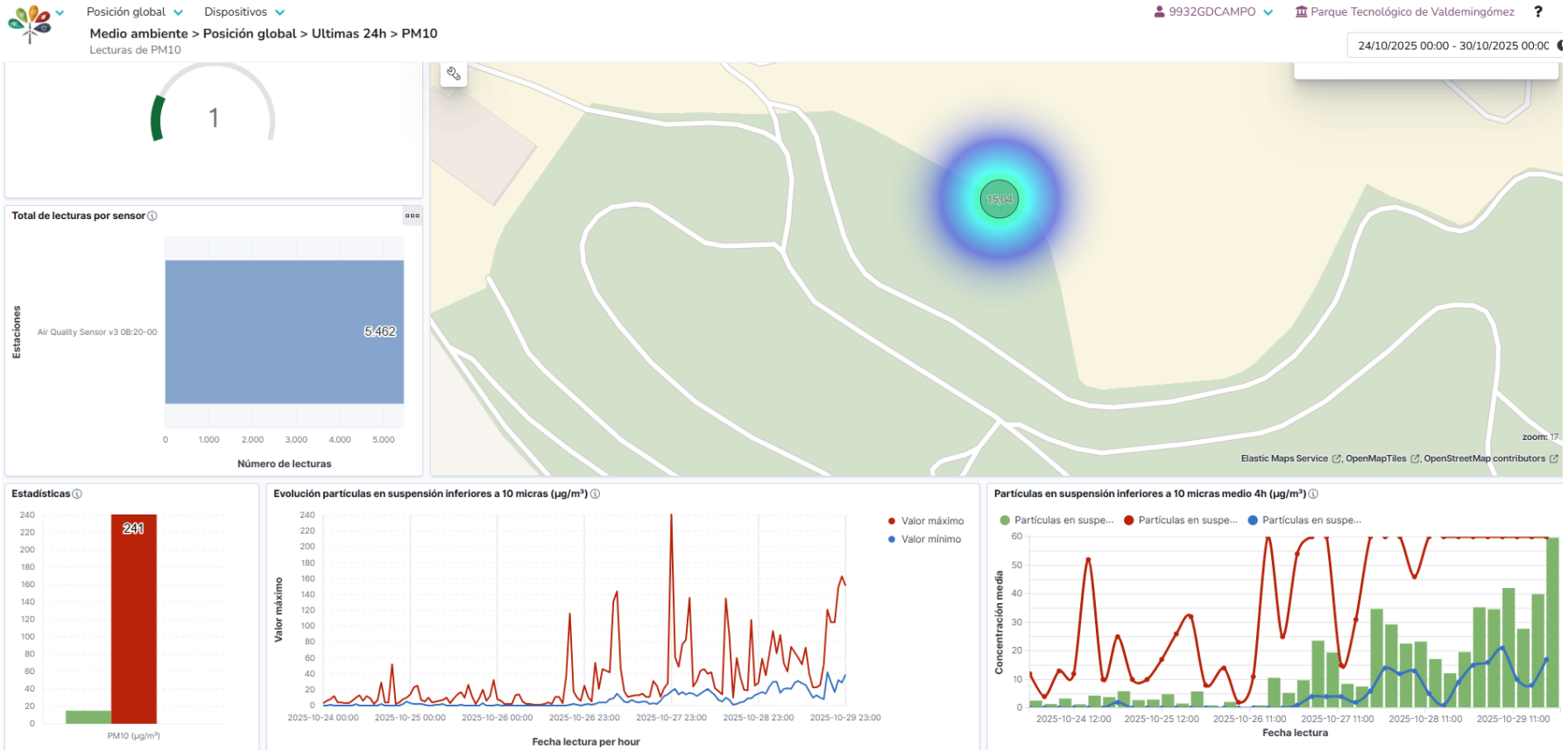
ENVIRONMENT



ENVIRONMENT



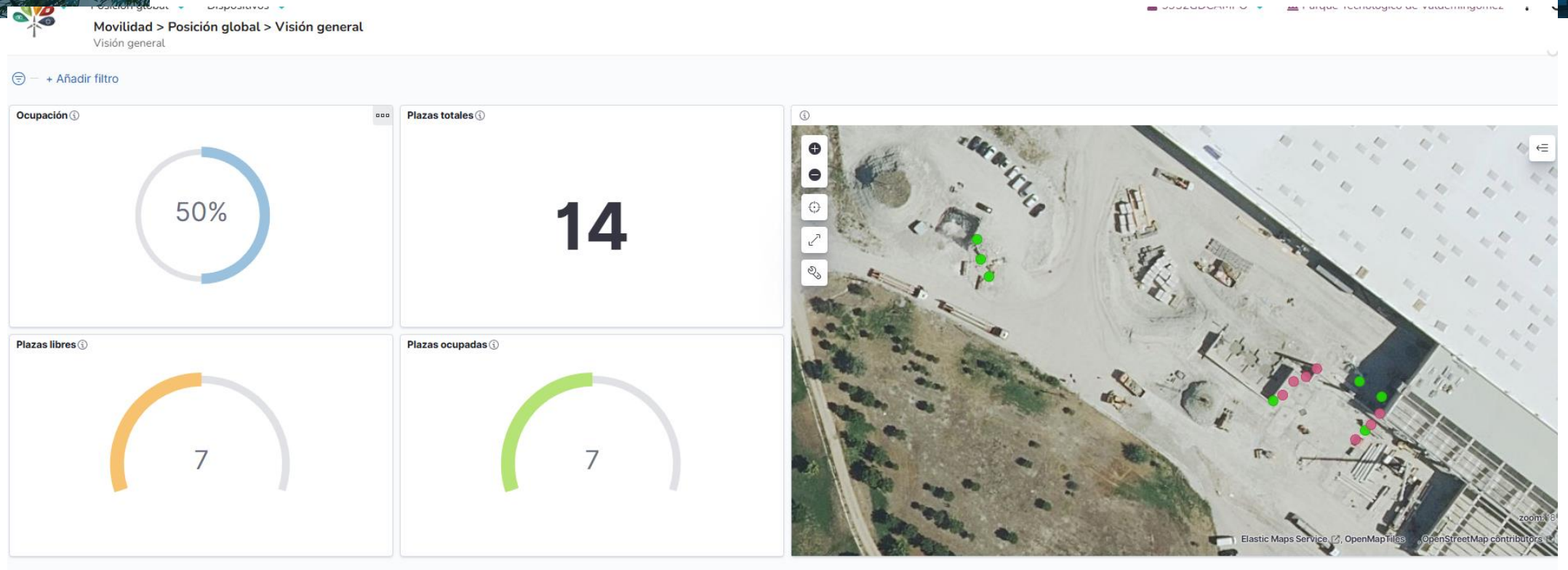
ENVIRONMENT



Capital Digital
MADRID

IoT MAD LAB
UNA CIUDAD CONECTADA

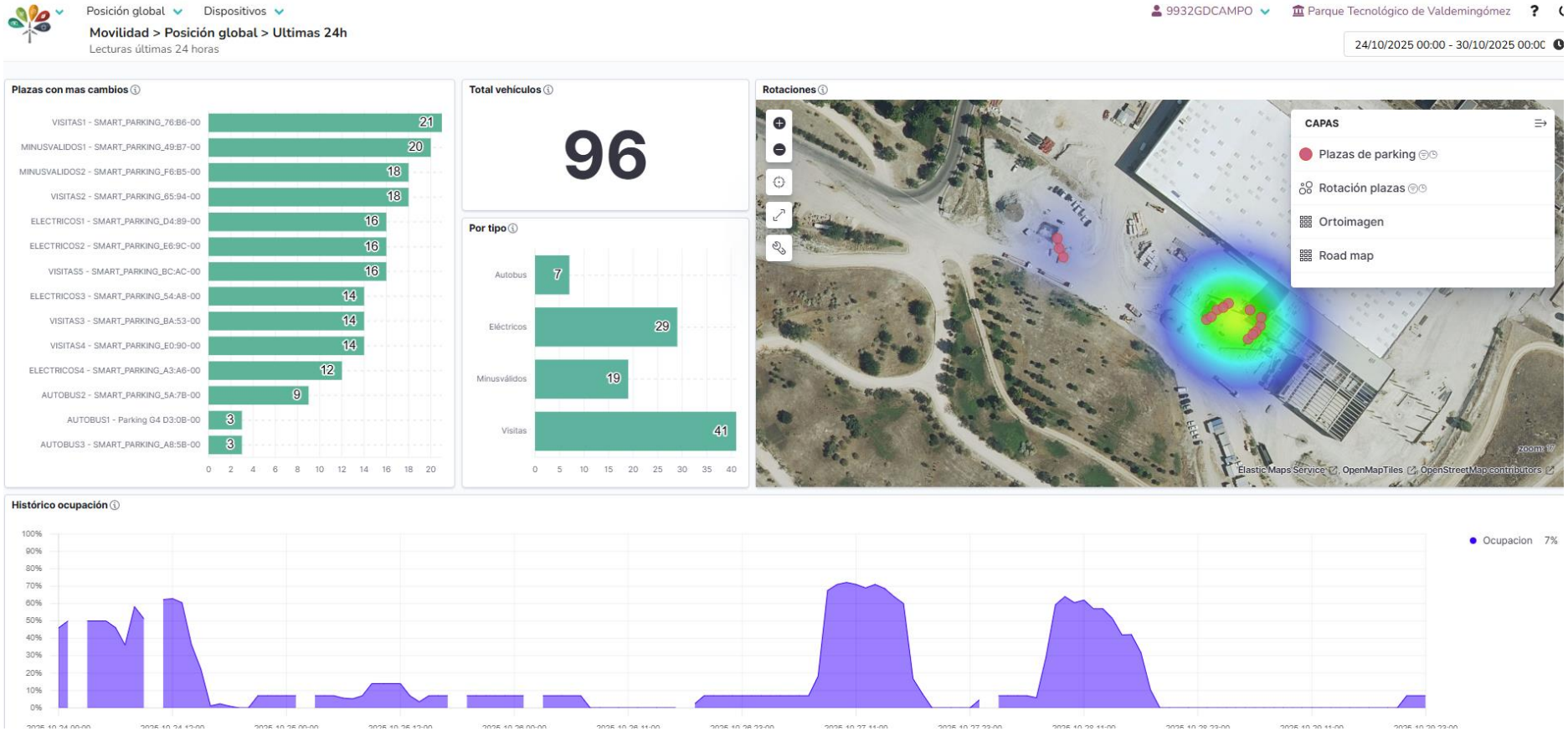
MOBILITY



eui

IoT MAD LAB
UNA CIUDAD CONECTADA

MOBILITY


Posición global
Dispositivos
9932GDCAMPO
Parque Tecnológico de Valdemingómez
Movilidad > Posición global > Ultimas 24h
Lecturas últimas 24 horas
24/10/2025 00:00 - 30/10/2025 00:00
Plazas con mas cambios
VISITAS1 - SMART_PARKING_76:B6-00 21
MINUSVALIDOS1 - SMART_PARKING_49:B7-00 20
MINUSVALIDOS2 - SMART_PARKING_F6:B5-00 18
VISITAS2 - SMART_PARKING_65:94-00 18
ELECTRICOS1 - SMART_PARKING_D4:89-00 16
ELECTRICOS2 - SMART_PARKING_E6:9C-00 16
VISITAS5 - SMART_PARKING_BC:AC-00 16
ELECTRICOS3 - SMART_PARKING_54:A8-00 14
VISITAS3 - SMART_PARKING_BA:53-00 14
VISITAS4 - SMART_PARKING_E0:90-00 14
ELECTRICOS4 - SMART_PARKING_A3:A6-00 12
AUTOBUS2 - SMART_PARKING_5A:7B-00 9
AUTOBUS1 - Parking G4 D3:0B-00 3
AUTOBUS3 - SMART_PARKING_A8:5B-00 3
0 2 4 6 8 10 12 14 16 18 20
Total vehículos
96
Por tipo
Autobus 7
Eléctricos 29
Minusválidos 19
Visitas 41
0 5 10 15 20 25 30 35 40
Rotaciones
CAPAS
Plazas de parking
Rotación plazas
Ortoimagen
Road map
Elastic Maps Service, OpenMapTiles, OpenStreetMap contributors
Histórico ocupación
100% 90% 80% 70% 60% 50% 40% 30% 20% 10% 0%
Ocupacion 7%

FUTURE ENHANCEMENTS

- AI-based vision systems for real-time object and vehicle recognition.
- Integration with renewable energy, e.g., solar-powered luminaires.
- Radiative cooling for LED durability and efficiency.
- Scalable deployment model for other municipal infrastructures.