Laboratorio de Inteligencia de Ciudad

(Colaboración Ayuntamiento–Universidad): IoT

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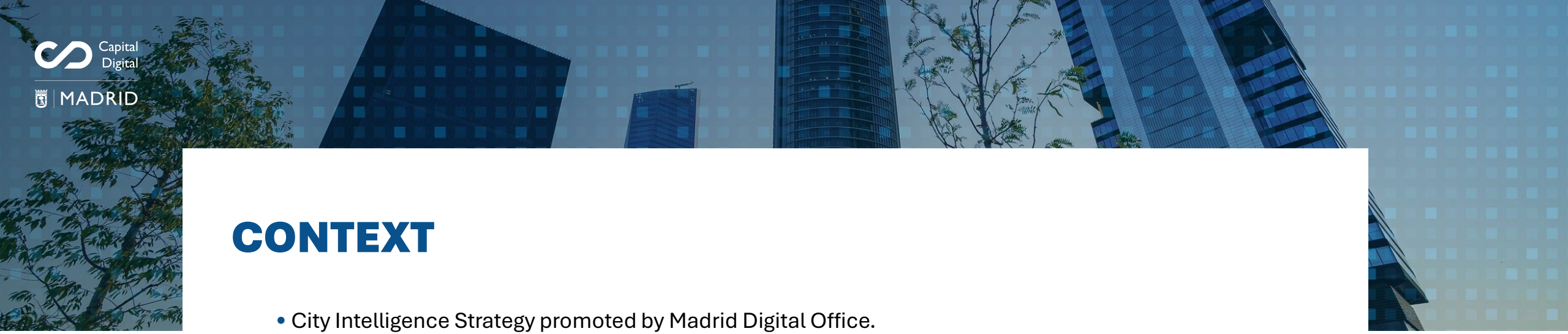
UNIVERSIDAD POLITECNICA DE MADRID

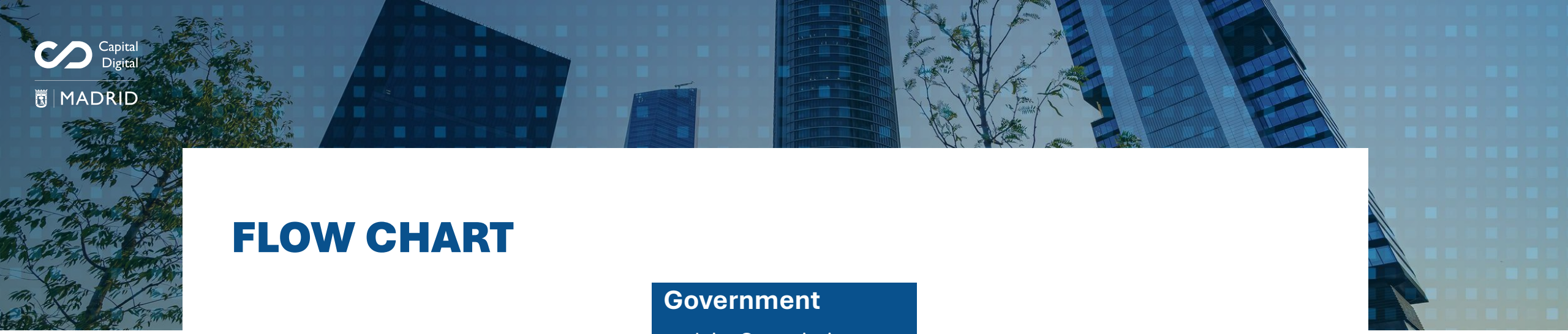
SMARTCITY
EXPO WORLD CONGRESS

AGREEMENT BETWEEN THE MADRID CITY COUNCIL AND THE UNIVERSIDAD POLITECNICA DE MADRID (UPM) FOR THE APPLICATION OF SMART CITY TECHNOLOGIES IN MUNICIPAL AND CITY SERVICES FOR THE PERIOD 2024-2028



CONTEXT

- City Intelligence Strategy promoted by Madrid Digital Office.
- Smart (sustainable, secure and equitable) cities are powered by technologies such as IoT, Digital Twins, 5G, Edge Computing, Big Data, AI and XR.
- Transversal approach to all the challenges of a large city: mobility, energy, economy, public services, employability and citizen participation.
- Based on appropriate security measures (blockchain, SIEM and IDS, etc).
- Disruptions and innovations demand prior analyses before scalability in the set of municipal services.
- Common and interoperable framework for sensors, actuators and other specific elements deployed in the city's infrastructures, equipment and facilities.
- Data Model and Data Spaces that guarantee the unequivocal interpretation and sharing of information, facilitating data management by the different municipal services in order to improve efficiency and service quality.



FLOW CHART

Government

- Joint Commission
- Executive Commitee
- Technical Office

Technology Working Groups

Internet of Things | 5G | Cybersecurity | Data/AI

Smart Urban Spaces

- Valdemingomez
- Cuña Verde
- Cuña Verde
- (up to 21 city districts)

City Challenges

- Connected vehicle
- Decarbonized cities
- Zero Energy Buildings
- Digital Twin
- Drones

Impact actions

- National and international projects
- Degree Awards
- Employment courses

Collaboration

- Industry participation
- Education and Research
- International network

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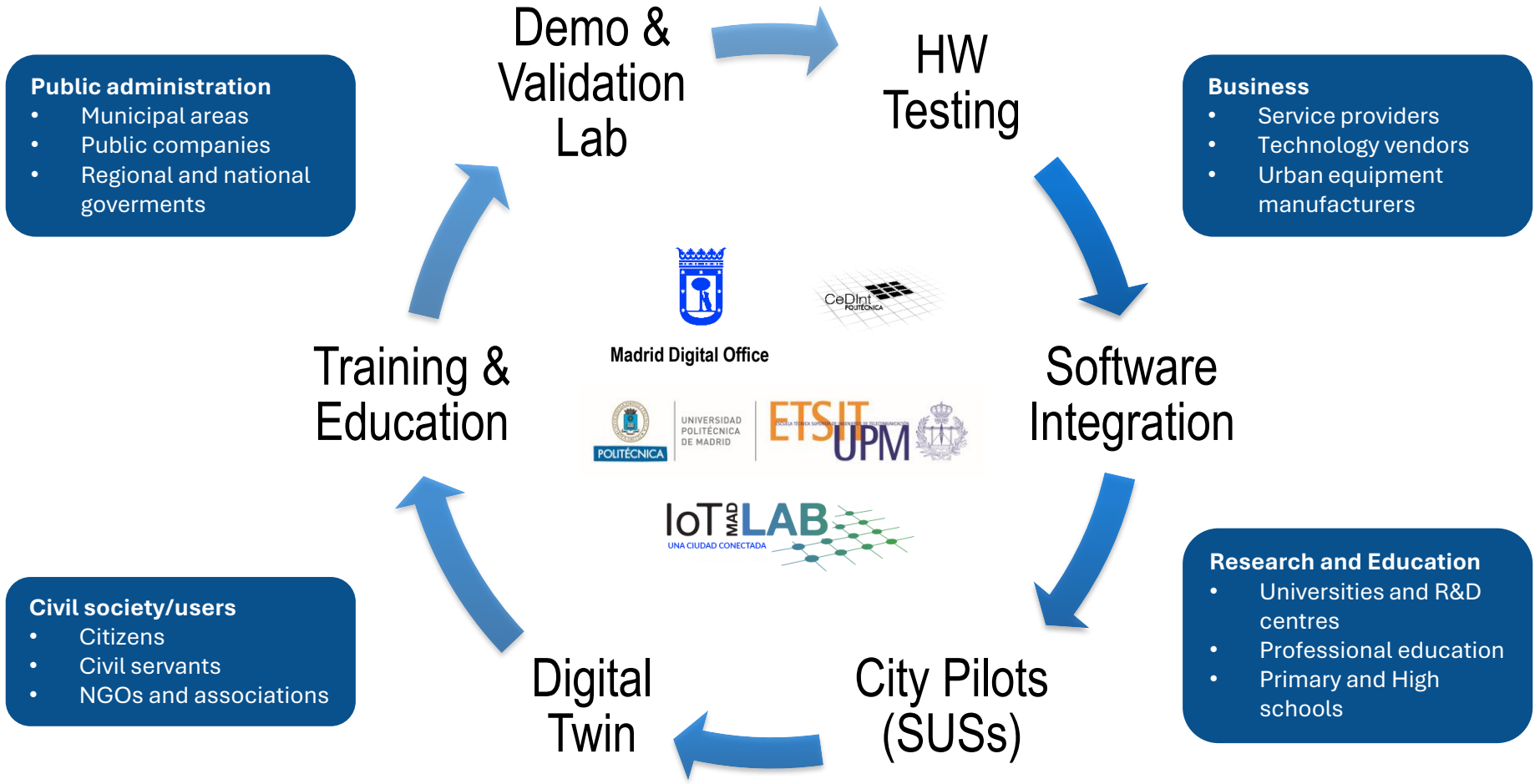

Public administration
- Municipal areas
- Public companies
- Regional and national goverments

Business
- Service providers
- Technology vendors
- Urban equipment manufacturers

Research and Education
- Universities and R&D centres
- Professional education
- Primary and High schools

Civil society/users
- Citizens
- Civil servants
- NGOs and associations

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IOT GROUP

• Harmonize future smart city implementations.

Identify open, neutral and interoperable IoT protocols and data models: technical requirements.

Enable interaction among municipal services.

• Boost Public-Private Innovation towards optimization and competitiveness:

Technological providers: devices, platforms, solutions, 5G operators.

Municipal services providers: management, applications, city platform.

Citizens: end user engagement & gamification.

Training and education: new skills for students and unemployed.

GovTech: digital government transformation.

• Smart Urban Spaces as living labs:

Laboratory environment (Phase 0).

University campus controlled environment (Phase 1).

Real urban environment (Phase 2).

Phase 0

Phase 1

Phase 2

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SCOPE - AREAS OF ACTION

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INDOOR LABORATORY: TESTBED AND CONTROL PANEL

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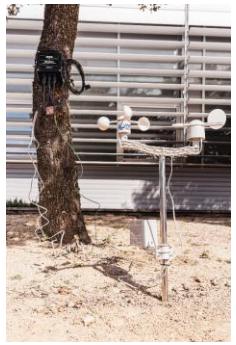
OUTDOOR LABORATORY: SMART SPACE IN A CONTROLLED AREA

IoT MAD LAB
UNA CIUDAD CONECTADA

CeDInt POLITÉCNICA







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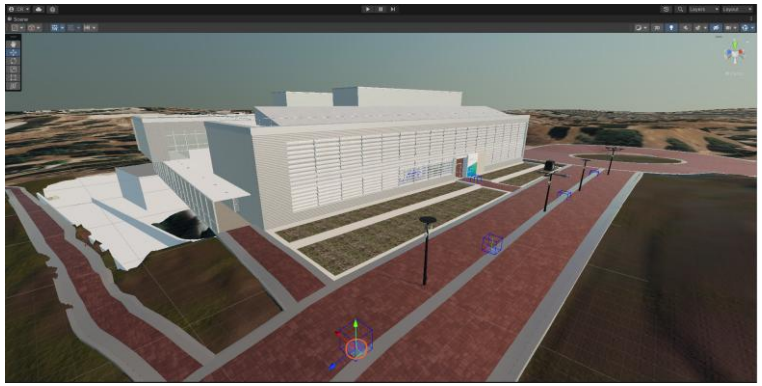
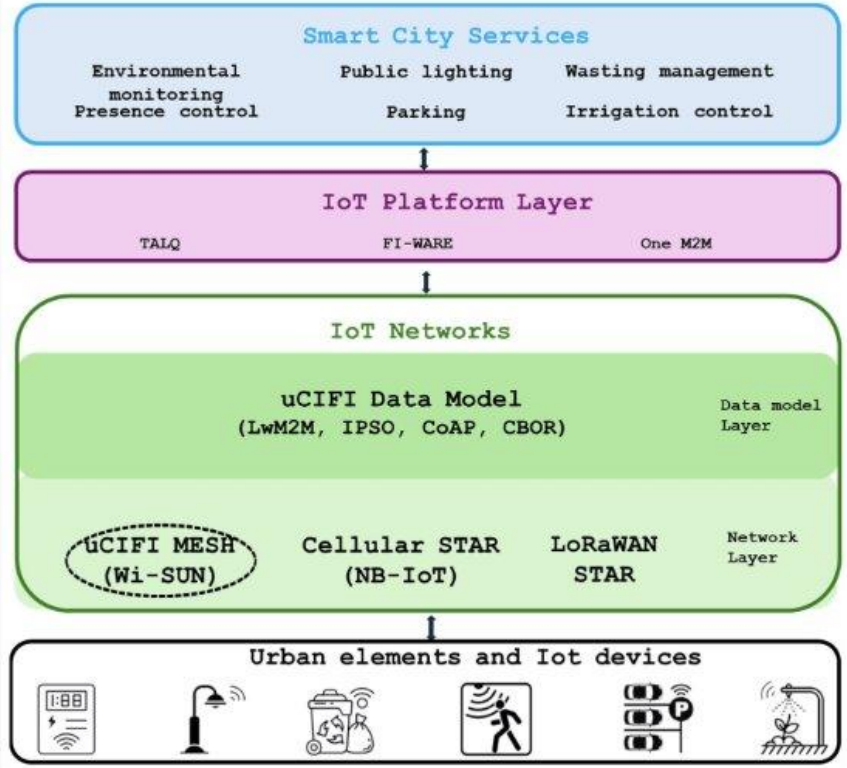
VR/AR LABORATORY: DIGITAL TWIN DEVELOPMENT



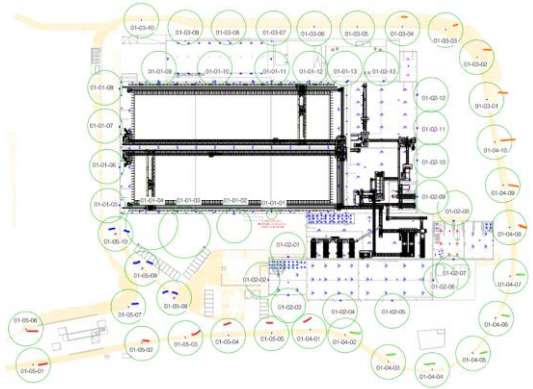
IOT NETWORK REFERENCE ARCHITECTURE



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

SUS#1 VALDEMINGOMEZ



IDE	ZONA/CM	LINEA ELECTRI	IDE LUMINA	MODELO LUMINARIA
01-03-01	1	3	1	VERA S VRS 60 ROAD III 500mA 4000K 60W - HISPALED
01-03-02	1	3	2	VERA S VRS 60 ROAD III 500mA 4000K 60W - HISPALED
01-03-03	1	3	3	VERA S VRS 60 ROAD III 500mA 4000K 60W - HISPALED
01-03-04	1	3	4	VERA S VRS 60 ROAD III 500mA 4000K 60W - HISPALED
01-03-05	1	3	5	LEDROAD-ST-P2- 4000k 80W - OPPLE
01-03-06	1	3	6	LEDROAD-ST-P2- 4000k 80W - OPPLE
01-03-07	1	3	7	LEDROAD-ST-P2- 4000k 80W - OPPLE
01-03-08	1	3	8	LEDROAD-ST-P2- 4000k 80W - OPPLE
01-03-09	1	3	9	LEDROAD-ST-P2- 4000k 80W - OPPLE
01-03-10	1	3	10	LEDROAD-ST-P2- 4000k 80W - OPPLE
01-04-01	1	4	1	ALFUM60 AE 4000K 60W - BENITO
01-04-02	1	4	2	VERA S 4000K 53,1W - CARANDINI
01-04-03	1	4	3	VERA S 4000K 53,1W - CARANDINI
01-04-04	1	4	4	VERA S 4000K 53,1W - CARANDINI
01-04-05	1	4	5	VERA S 4000K 53,1W - CARANDINI
01-04-06	1	4	6	VERA S 4000K 53,1W - CARANDINI
01-04-07	1	4	7	VERA S 4000K 53,1W - CARANDINI
01-04-08	1	4	8	VERA S VRS 60 ROAD III 500mA 4000K 60W - HISPALED
01-04-09	1	4	9	VERA S VRS 60 ROAD III 500mA 4000K 60W - HISPALED
01-04-10	1	4	10	VERA S VRS 60 ROAD III 500mA 4000K 60W - HISPALED
01-05-01	1	5	1	ALFUM60 AE 4000K 60W - BENITO
01-05-02	1	5	2	ALFUM60 AE 4000K 60W - BENITO
01-05-03	1	5	3	ALFUM60 AE 4000K 60W - BENITO
01-05-04	1	5	4	ALFUM60 AE 4000K 60W - BENITO
01-05-05	1	5	5	ALFUM60 AE 4000K 60W - BENITO
01-05-06	1	5	6	ALFUM60 AE 4000K 60W - BENITO
01-05-07	1	5	7	TECEO 1 30 LEDS 800mA 4000K óptica 5303 77W - SOCELEC
01-05-08 a	1	5	8	TECEO 1 30 LEDS 800mA 4000K óptica 5303 77W - SOCELEC
01-05-08 b	1	5	8	TECEO 1 30 LEDS 800mA 4000K óptica 5303 77W - SOCELEC
01-05-09 a	1	5	9	TECEO 1 30 LEDS 800mA 4000K óptica 5303 77W - SOCELEC
01-05-09 b	1	5	9	TECEO 1 30 LEDS 800mA 4000K óptica 5303 77W - SOCELEC
01-05-10 a	1	5	10	TECEO 1 30 LEDS 800mA 4000K óptica 5303 77W - SOCELEC
01-05-10 b	1	5	10	TECEO 1 30 LEDS 800mA 4000K óptica 5303 77W - SOCELEC

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

SUS#1 VALDEMINGOMEZ

- **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.

- **Adaptative lighting**

Motion-based adaptation

Environmental adaptation

Parking optimization

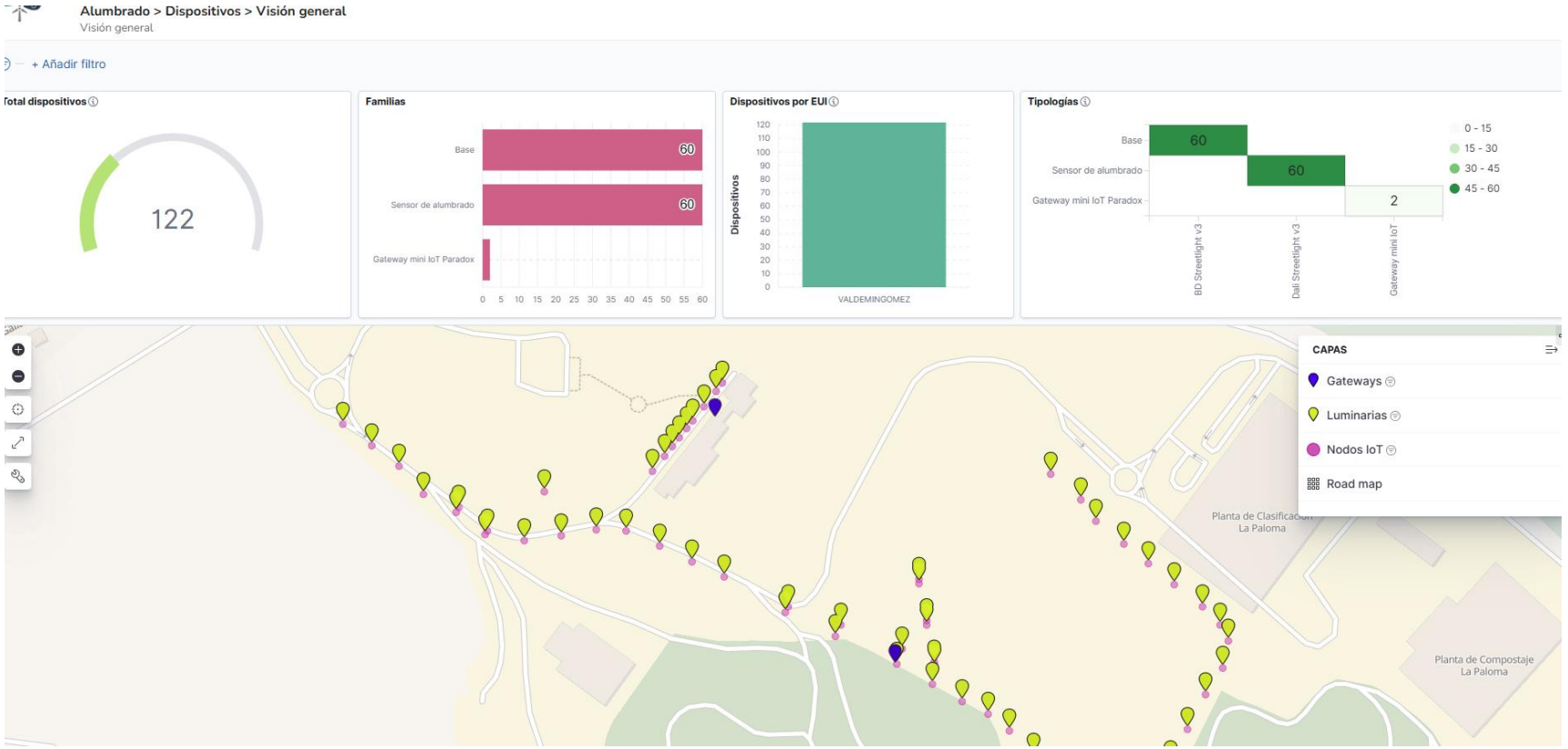
- **Data driven platform:**

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.

SUS#1 VALDEMINGOMEZ



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SUS#2 MERCAMADRID

MOBILITIES FOR EU

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SUS#2 MERCAMADRID

- **IoT devices**

40 LED luminaire controllers, each capable of adjusting brightness levels dynamically.

12 PIR sensors for motion detection.

25 parking occupancy sensors for monitoring vehicle presence.

Several environmental sensors, including noise, temperature, humidity, air quality, flood, rain, and UV radiation sensors.

14 Electricity consumption meters.

- **Adaptative lighting**

Motion-based adaptation.

Environmental adaptation and traffic signaling.

Parking optimization

- **Data driven platform:**

Characterize the daily and nightly activity of the market.

Integration with autonomous vehicles (regulation and signaling).

Enable predictive maintenance and energy-use optimization.

INDUSTRY AND INTERNATIONAL SUPPORT