INTEROPERABILITY in IoT

Application of eGovERA in Madrid's Smart Urban Spaces: ensuring the interoperability of digital public services in a context of city intelligence data spaces.

EUROPEAN COMMISSION DIGIT B2

Directorate-General for Informatics (DIGIT)

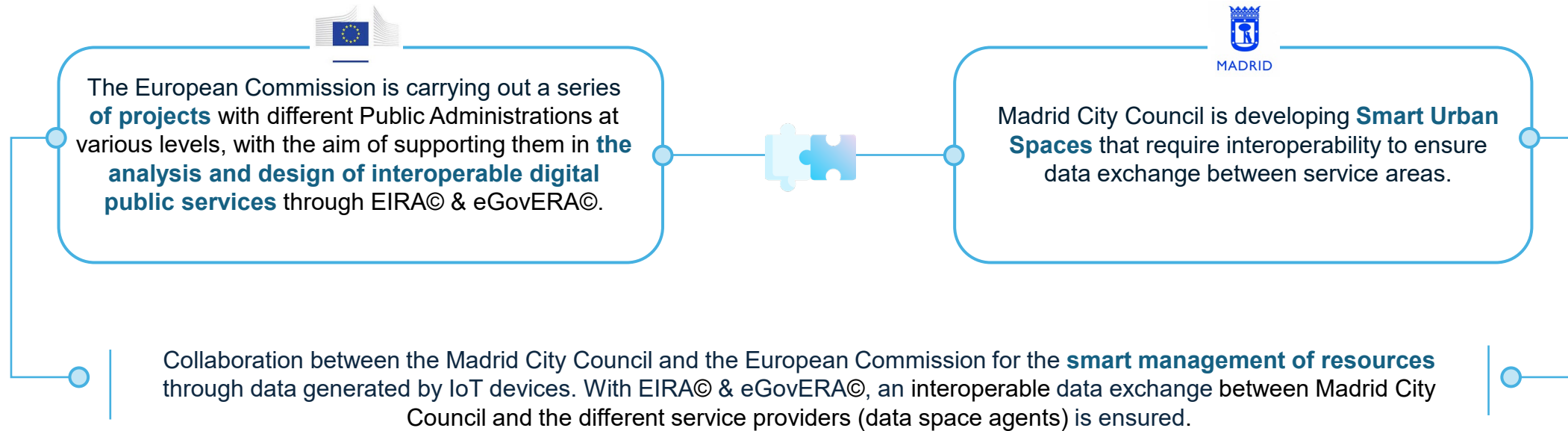Project Officer: Dr. Raul Abril

interoperable europe

Capital Digital

01.

CONTEXT

The opportunity for the intervention. Space for strategic collaboration

Strategic collaboration between the **European Commission** and the **Madrid City Council** in the field of data spaces and smart cities, identified through FEMP

The European Commission is carrying out a series **of projects** with different Public Administrations at various levels, with the aim of supporting them in **the analysis and design of interoperable digital public services** through EIRA© & eGovERA©.

Madrid City Council is developing **Smart Urban Spaces** that require interoperability to ensure data exchange between service areas.

Collaboration between the Madrid City Council and the European Commission for the **smart management of resources** through data generated by IoT devices. With EIRA© & eGovERA©, an interoperable data exchange between Madrid City Council and the different service providers (data space agents) is ensured.

ESPACIO URBANO INTELIGENTE
MERCAMADRID

Focus on the areas of **lighting** and **water**

Digital Transformation in Public Administrations

Information and Communication Technologies (ICT) have become the basis for new economic and social systems. The European Union has recognised the **fundamental** role **of digital transformation as a driver for development and growth.**

Digital transformation in the **public sector** has resulted in...

- **New forms of digital interaction between government and citizens**
- **Increase of the provision of digital public services by public administrations**
- **Significant increase in the volume of data generated and exchanged at EU level**

New need in the Public Administration, **INTEROPERABILITY**

*Ability of applications and systems to **exchange data securely and automatically**, regardless of geographical, political or organisational boundaries.*

The European Union is responding to the need for interoperability **with legislative and public policy efforts**, with an emphasis on the interoperability of digital public services. The latest of these is the *Interoperable Europe Act, a* regulatory and co-operative framework to promote interoperability in EU public administrations.

In Spain, the **National Interoperability Scheme** *(ENI*) came into force in 2010 and has been updated to reflect changes in context and subject matter. This text establishes the necessary conditions to guarantee the appropriate level of interoperability in public administration.
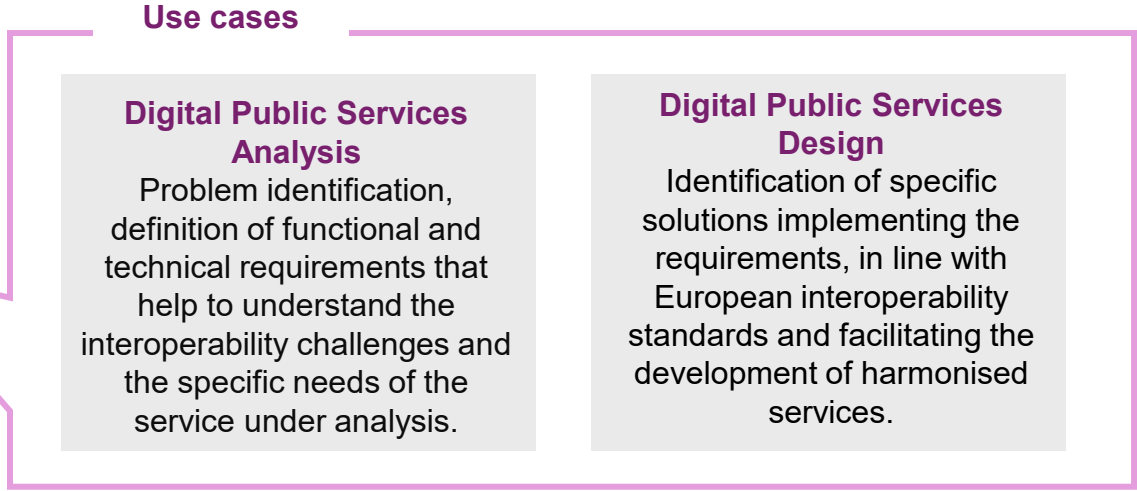
European Commission Interoperability Solutions

In the framework of the European Union's efforts towards an Interoperable Europe, the European Commission has developed solutions to **support Public Administrations** in the implementation of **interoperable digital public services.**

Use cases

EIRA
EUROPEAN
INTEROPERABILITY
REFERENCE
ARCHITECTURE

Reference architecture for the analysis and design of interoperable digital public services. Defines the capabilities needed to ensure that digital services are interoperable by design.

eGovERA
for eGovernment
and digital
transformation

Specifications based on EIRA© to support digital transformation in Public Administrations. It includes reference architectures for different sectors, as well as a diagnostic tool to support the construction of interoperable solutions.

Digital Public Services Analysis
Problem identification, definition of functional and technical requirements that help to understand the interoperability challenges and the specific needs of the service under analysis.

Digital Public Services Design
Identification of specific solutions implementing the requirements, in line with European interoperability standards and facilitating the development of harmonised services.

L Applicable legislation and legal requirements

O Organisational, business and organisational structure requirements

S Standardisation of data and vocabularies

T Technical protocols and interface for data exchange

Legal

Organisational

Semantic

Technical

Madrid as Digital Capital

One of the main dimensions of the Madrid City Council's Digital Strategy is **city intelligence** thanks to a greater intensity in the use of data. The ultimate goal, a city managed through data obtained in real time to advance in the automated management of public services.

INITIATIVE. Smart Urban Spaces

Selection of **key sites** as testing spaces for the **application of** cutting-edge **technologies** (**IoT** - 5G - or **sensor installation** in urban equipment).

Collection, analysis and use of data from the spaces themselves, enabling smarter and more sustainable management of the sites

Personas

- Limpieza y residuos
- Medioambiente
- Zonas verdes, parques y jardines
- Instalaciones urbanas
- Seguridad y emergencias
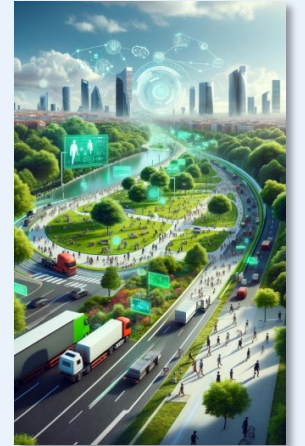- Espacio Urbano
- Movilidad
- Energía
- Alumbrado
- Network

ESPACIO URBANO INTELIGENTE CASA DE CAMPO

ESPACIO URBANO INTELIGENTE VALDEMINGÓMEZ

ESPACIO URBANO INTELIGENTE MERCAMADRID

The **success** of this initiative requires the need for integration and **interoperability** of various systems, technologies and platforms.

02.

COLLABORATION BETWEEN THE MADRID CITY COUNCIL AND THE EUROPEAN COMMISSION

Methodological approach

The **working methodology of** the project is based on **multidisciplinary teams** and **joint development**.

STAKEHOLDERS INVOLVED

- **Madrid Digital** Office
- **IoT MadLab**
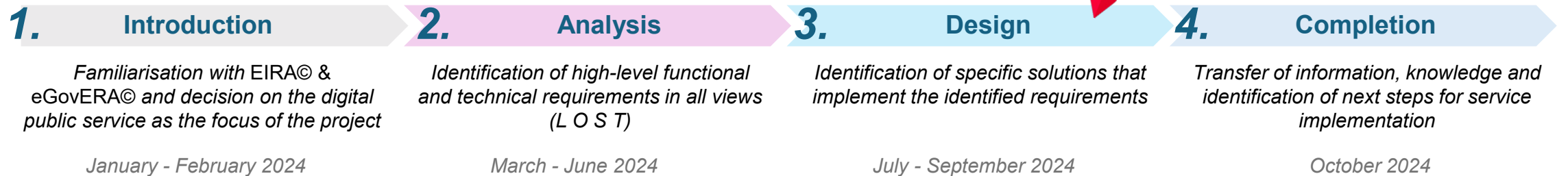- Responsibles **for lighting and water** areas

ACCOMPANYING TEAM

Importance of a **multidisciplinary** team
- **Legal** and **business** analysts
- **Semantic** experts
- **IoT device** experts
- **Solution** Architects

COLLABORATION PRINCIPLES

- Spaces for **ideation and co-creation**
- **Multiple interviews** to gather key information
- **Validation sessions** with the City Council and the different areas

PROJECT PHASES

1. Introduction

Familiarisation with EIRA© & eGovERA© and decision on the digital public service as the focus of the project

January - February 2024

2. Analysis

Identification of high-level functional and technical requirements in all views (L O S T)

March - June 2024

3. Design

Identification of specific solutions that implement the identified requirements

July - September 2024

4. Completion

Transfer of information, knowledge and identification of next steps for service implementation

October 2024

Main results

Digital public service models based on EIRA© & eGovERA©

Guidelines to finalise the models

Analysis model

Partial solution design model
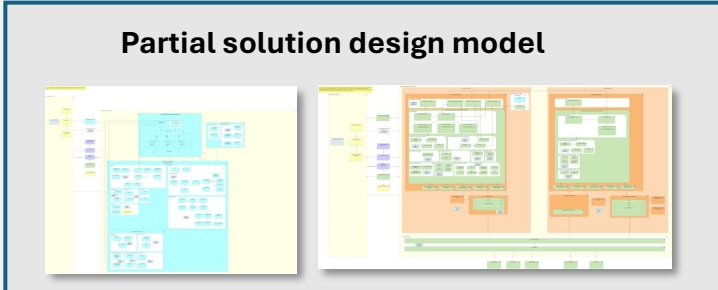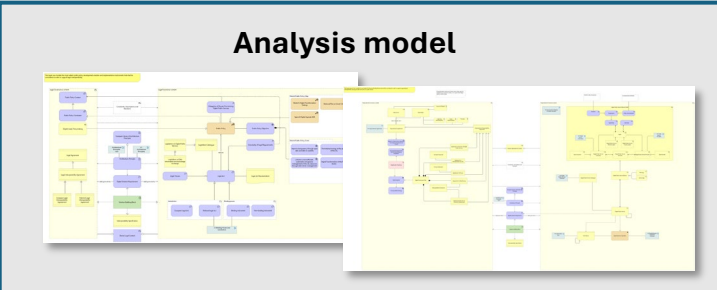
L O S T

Applicable legislation at EU, national and regional level

Service definition, identification of functional and technical requirements, digital capabilities and service delivery model

Data models, ontologies and vocabularies to standardise information. Syntax, formats, validation schemes and exchange protocols.

Technical architecture, including *back-end* and *front-end* services, cloud infrastructure, security, monitoring, and communication protocols

BENEFITS

Solution developed by the **European Commission**, in line with the latest European interoperability policies and compatible with compliance testing tools such as **TestBed**
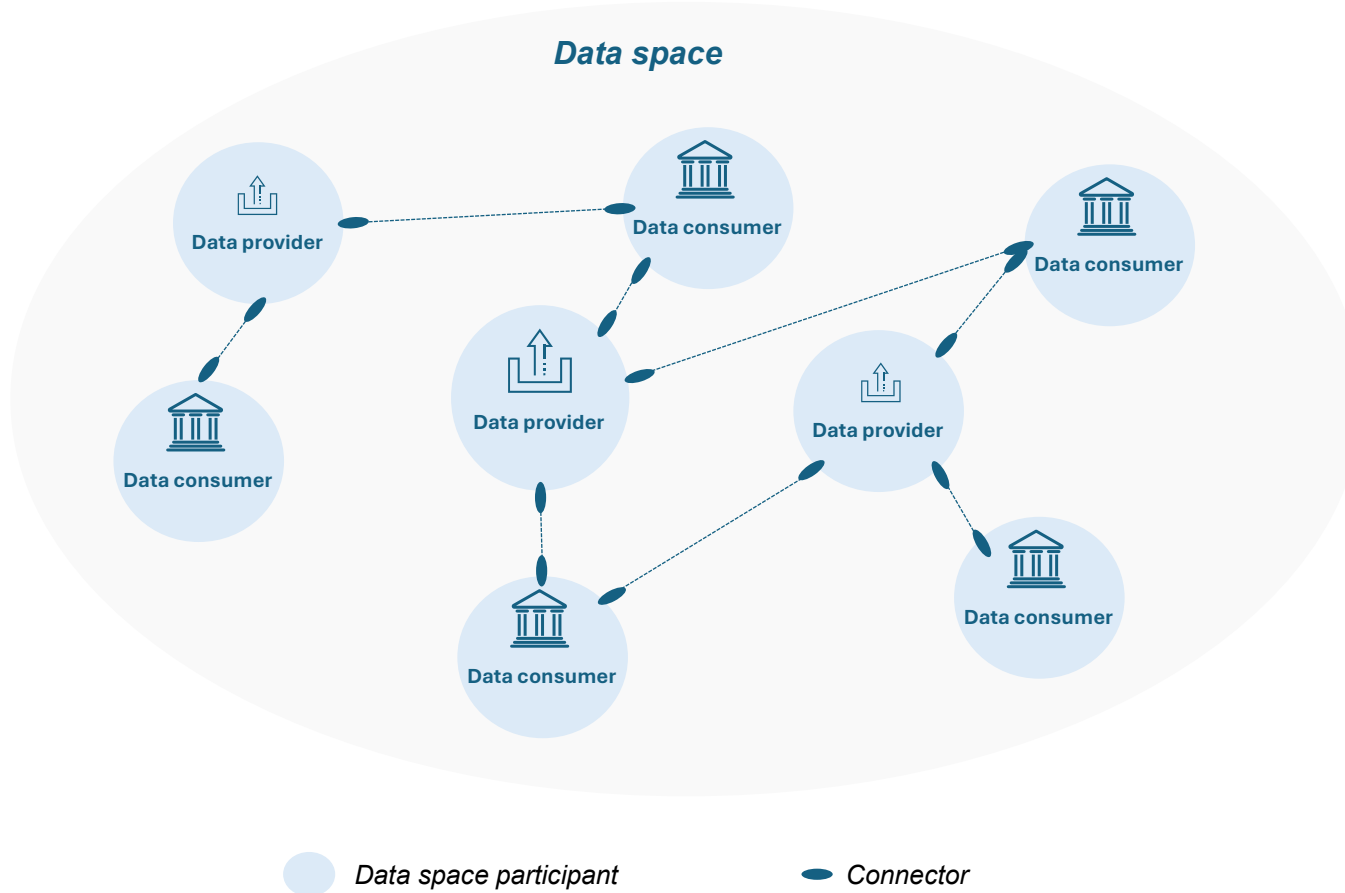
Scalable model **adaptable** to future needs and developments, including other **Smart Urban Spaces** and **service areas**

Innovative and **pioneering** efforts in smart city data space design

Interoperability in data spaces: European approach

Data space

Data provider

Data consumer

Data consumer

Data provider

Data provider

Data consumer

Data consumer

Data consumer

Data space participant   Connector

KEY POINTS

- The data space provides the necessary applications and infrastructure to **enable the exchange of data between providers and consumers**. Once communication between the parties is established, **data exchange takes place directly** between the provider and the consumer

- Within the data space **there are no intermediaries and no aggregation** of data (*data lake, data warehouse*)

- The **data provider has sovereignty over the data**, which implies that it has absolute control over the data. This allows it, among other competencies, to determine to which participants it grants access, to which specific data, and under what conditions or permissions such access is granted