Madrid Green & Digital Transition for a smart, sustainable and just city

Strategic Framework

Because Digital is Capital

Madrid, Capital Digital

October 2025

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Executive Summary

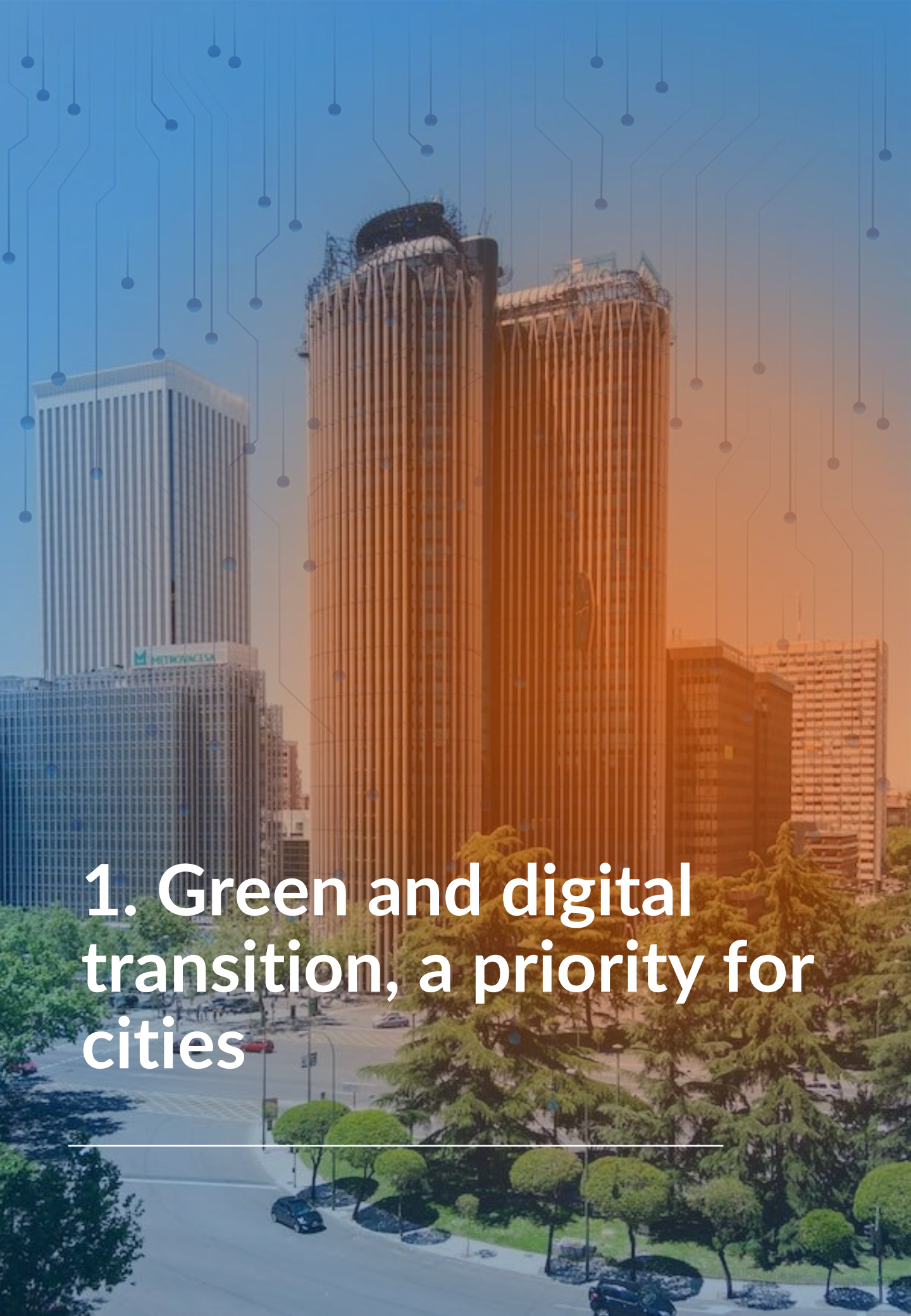
The **Madrid City Council's Green and Digital Strategic Framework** establishes the strategy to move towards a city that adapts to people, coherently integrating the sustainable transition with digital transformation.

This framework is aligned with the main international, European and national guidelines that promote the double green and digital transition as a driver of sustainable development. The **OECD** highlights its potential to build smart, inclusive and sustainable cities; the European Union has integrated it through the **European Green Deal**; The United Nations has promoted the **Declaration on Green Digital Action** to accelerate climate action through digital technologies and Spain includes it in the Recovery Plan, the PERTE projects, the Digital Spain Strategy 2026 and the National Integrated Energy and Climate Plan 2030, positioning it as a key opportunity for the country's economic and social progress. In this context, **Madrid is one of the Mission Cities of the European Union**, selected to achieve climate neutrality by 2030 and with the **Green and Digital Strategic Framework** it reinforces and enhances this commitment, placing itself at the forefront of these initiatives.

The framework is not limited to a technological or environmental vision, it rather **acts as a comprehensive strategy that articulates and enhances some of the city's main plans**: **Madrid 360**, focused on sustainability and climate neutrality; **Madrid Capital Digital**, a driver of technological modernisation and digital transformation; and ***Sueña Madrid***, which marks the urban planning of the future. The great contribution of the framework is to obtain **synergies between these three strategies**, aligning them under a single umbrella and extolling the **double green and digital transition as a joint process** that not only promotes environmental sustainability and technological innovation, but also **places people at the centre of the city**'s transformation. In this sense, data and data spaces, generative artificial intelligence, interoperable IoT, the deployment of 5G, autonomous and connected vehicles are particularly relevant. In short, it is committed to systems that respond to ethical, human and sustainable criteria.

For all these reasons, the **framework incorporates a transversal social dimension** that is reflected in digital inclusion, equity, citizen participation, digital innovation and co-creation. Digital talent is also promoted and a city that responds and adapts in real time to the needs of people and the environment is built. In this way, a **more equitable city is promoted, where technology and sustainability serve as tools that enable everyone to benefit from the twin transition**.

> Madrid is committed to a transformation that not only modernises the city, but also humanises it, making this transition a lever to build a more inclusive, digital, sustainable city that is prepared for the challenges of the future.



1. Green and digital transition, a priority for cities

The double transition, a fundamental element to build smart and sustainable cities focused on people

In recent years, the concept of the double transition, green and digital, has become increasingly important in international, European and national strategies.

While both transitions can be complementary in many ways, they are not always automatically aligned. Therefore, an integrated vision, known as "**twin transition**", is required, which seeks to proactively combine both to achieve positive impacts in each.

The **OECD** highlights that the convergence of both transitions is key to achieving **smart, inclusive and sustainable cities**, offering an opportunity to achieve climate objectives such as achieving a net-zero economy or reducing emissions in urban areas for example in buildings and transport.

Since 2019, the **European Union** has integrated the **twin transition** into its strategies to build a sustainable, fair and competitive Europe. **This integrated vision is proposed to enable its maximum potential and prevent negative effects** and is defined as a cross-cutting approach in different strategic initiatives:

- *European Green Deal 2019*
- *European Growth Model 2022*
- *Pathway to the 2030 Digital Decade*
- *European Commission´s Intelligent Cities Challenge*
- Misión *EU Climate-neutral and Smart Cities* Horizon Europe
- *Eurocities 2030 Strategy*

More recently, the interdependent relationship between the two transitions has brought the double transition to the heart of the United Nations, promoting in November 2024 the **Declaration on Green Digital Action** in which various actors commit to using digital technologies to accelerate climate action and promote sustainable digitalisation.

In **Spain**, both the ***Recovery, Transformation and Resilience Plan*** and the strategic **PERTE** projects are the main promoters of the double transition in the country. In addition, Spain has the ***Spain Digital 2026 Strategy*** and the ***National Integrated Energy and Climate Plan 2030***, placing the **green and digital transition as one of the main opportunities for the country's economic development and progress**.

Environmental **sustainability** is a complex challenge for cities as they contribute a high percentage of anthropogenic greenhouse gas (GHG) emissions. However, it is in cities where many of the solutions to the climate crisis can be generated, while contributing to improving the quality of life of those who live in them.

In this context, **digital technologies** are key to moving towards a **net-zero emissions economy and achieving environmental sustainability,** as they promote the creation of efficient and innovative solutions, focused on accelerating and enhancing the positive impacts of the green transition of cities for the benefit of their inhabitants. They allow, for example:

- Improve the efficiency of decarbonization technologies.
- Optimize smart grids.
- Intelligently integrate renewable energy infrastructure, electric vehicle charging, and smart buildings.
- Process more data efficiently.
- Monitor and follow up efficiently and in real time.
- Identify problems faster and test solutions virtually.
- Increase efficiency in the use of resources through the digitization of services.

However, these technologies also present **sustainability challenges**, as they can generate a considerable environmental footprint. The growth in the use of blockchain, machine learning and big data, together with the increase in data consumption, could significantly increase the carbon footprint in the coming years[1].

For this reason, it is important to accompany digital transformation with sustainable practices such as:

- Promote the selection of technologies or devices that ensure energy efficiency and minimize environmental impact throughout their life cycle.
- Ensure green algorithms: designed from the outset in the efficient use of the resource.
- Promote interoperable and modular architectures that seek greater efficiency.
- Increase awareness, focusing on behaviours related to the acquisition and use of technology that impact energy consumption and emissions.

1. Belkhir, L. & Elmeligi, A. (2018), 'Assessing ICT global emissions footprint: Trends to 2040 & Recommendations', Journal of Cleaner Production.

The twin transition initiated in cities

Cities have incorporated the double transition in the execution of projects that seek to use new digital technologies to generate positive impacts on the environment and on people's quality of life.

By putting people at the center of climate action and digital transformation, **cities can become healthier, more prosperous, and more inclusive places for their inhabitants,** with positive impacts, improving public service delivery, environmental indicators, public health, and jobs.

Examples of cities that have taken advantage of this twin transitions to become smart, sustainable, and inclusive places include:

Copenhagen, Denmark – Green Mobility Plan

Green mobility plan: Among other initiatives, the replacement of conventional transport with electric transport (buses, metro and private utility vehicles) stands out. In addition, it has a traffic management system based on real-time data that they use to optimize the flow of the city and, consequently, reduce the carbon footprint.

Klagenfurt, Austria – Digital Twin

Digital twin: This is a Smart city project that seeks, among other things, to improve the efficiency of the city's resources. In this case, it even calculates the effect of the shadows cast by each tree, in summer and winter, to provide an accurate calculation of the solar energy potential of each home and business in the city.

Mannheim, Germany – Hitachi Columbus campus

Neutral offices: consists of a public-private partnership project on the construction of a climate-neutral complex, using hybrid construction and employing smart technology to manage energy, ventilation, water consumption, etc., efficiently.

Amsterdam, Netherlands – Energy Atlas:

Energy map: consists of a multi-layered energy GIS tool with a software decision support system that allows providing what-if scenarios to improve urban energy planning.

Milán, Italia – Smart Lighting

Smart Luminaire: Milan has developed an initiative that consists of adding sensors and IoT technology in the lighting system, turning them into smart streetlights that enable new services such as adapting lighting according to environmental conditions or identifying faults or inefficiencies, promoting energy efficiency and reducing light pollution.

San Francisco, United States – STiR Program

Smart Garbage Collection: within the STiR program, the city of San Francisco implemented different sensors in garbage containers to monitor their capacity in real time, their temperature, if the waste is fermenting or rotting, if a container has been knocked over or destroyed, etc.

2. Green and digital transformation, a reality in Madrid

Madrid's Green and Digital Transition Strategic Framework

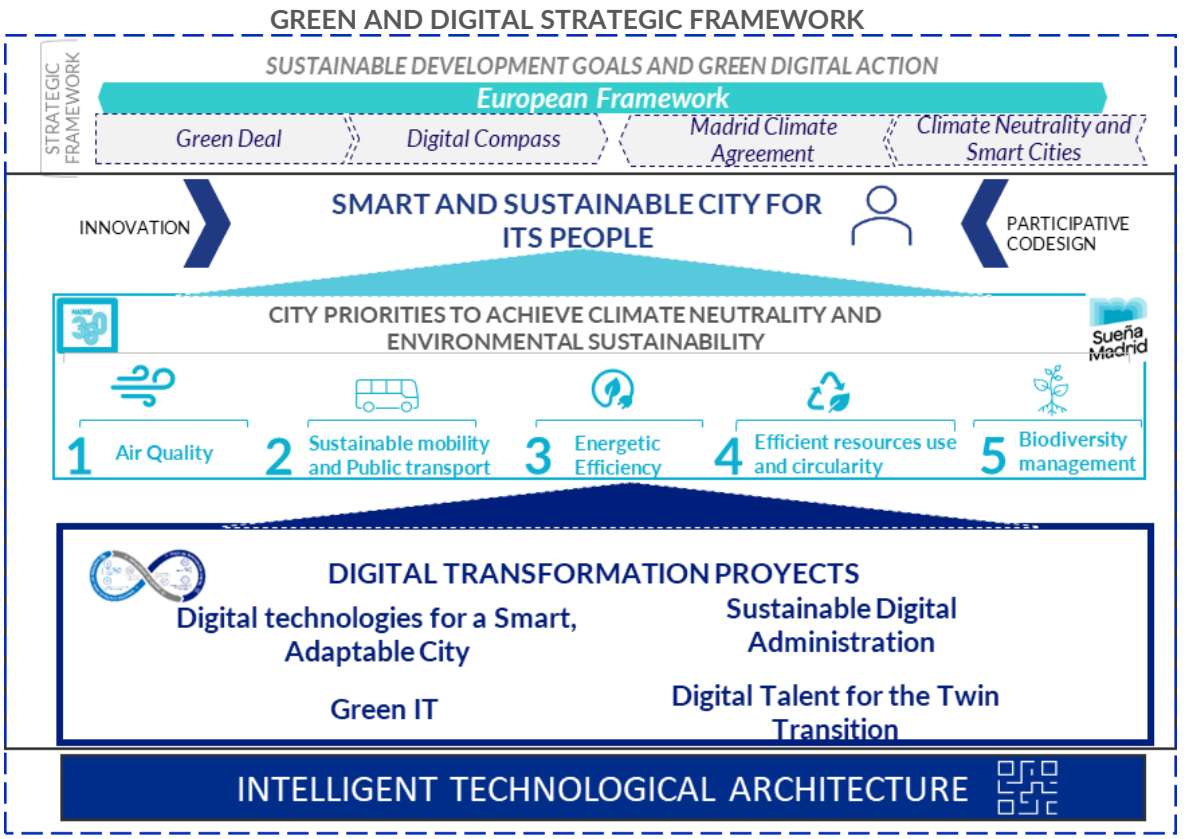
Madrid presents this **Strategic Framework** with the aim of **promoting digital transformation to accelerate the positive impact of the city's green transition and integrate sustainability into the digitalisation process**.

With this strategic planning document, the city moves forward with a vision of the future aligned with international trends, seeking to anticipate the needs of citizens **in order to consolidate itself as a smart, sustainable and just city**. It includes the progress and evolution of the city in terms of environmental sustainability and digital transformation, always putting **the citizen at the centre**.

The Framework identifies 4 dimensions of the digital transformation of the **Madrid Digital Capital Strategy ,** that support the city's priorities to achieve climate neutrality and environmental sustainability established in the Madrid 360 Strategy and aligned with the priorities of the *Sueña Madrid* Strategy

In a transversal way, it seeks to make the city's innovation ecosystem a fundamental ally to find the best solutions and ensure this acceleration of impacts, providing new technological solutions to complex problems and promoting social innovation as a valuable resource to **co-design** these solutions with the different actors present in the city.

All of this is supported by an **intelligent technological architecture** that facilitates efficient management of the city and allows progress towards the vision of a smart and sustainable city.



The different components of the Framework are defined as follows: it begins by identifying how **the priorities of both transitions – green and digital – are integrated to generate positive impacts** for the city and its inhabitants. Then, the **governance** of the Framework is detailed, and a set of indicators is proposed to measure the progress of this double transition. Subsequently, the **city intelligence architecture** that underpins the digital transformation is described. Finally, the **4 axes** of the Framework are presented, defined according to the impact dimensions explained above, together with the **projects of the Madrid Digital Capital Strategy** where the impact of the double transition in the city materializes.

A smart and environmentally sustainable city

Madrid today has powerful strategies that contribute to its strengthening as a **smart and environmentally sustainable city** and strengthen the **green and digital transition in the city**. Although the city is moving forward by articulating digitalisation and sustainability in a transversal way, this Framework includes 3 major strategies that catalyse the impact of the double transition:

Madrid, Digital Capital, is the strategy that the City Council has defined **to continue being a city** of reference in the digital sphere.

The **Madrid 360** Environmental Sustainability Strategy was created to reduce polluting emissions in the capital, consolidating it as a sustainable city.

Sueña Madrid is the city planning project for the urban development of the city of the future.

These strategies have advanced with various projects and initiatives, highlighting the following examples:

The ambitious commitment to climate **neutrality 2050** requires urban transformation and the cross-cutting integration of climate action into municipal policies.

Thus, and under the focus of innovation and climate collaboration, **Madrid** has presented (2022) its proposal to integrate the **European Mission for Smart and Climate Neutral Cities** (Horizon Europe 2021-2027) to support and promote the transformation of **100 European cities towards climate neutrality** by 2030 to turn them into centres of experimentation and innovation.

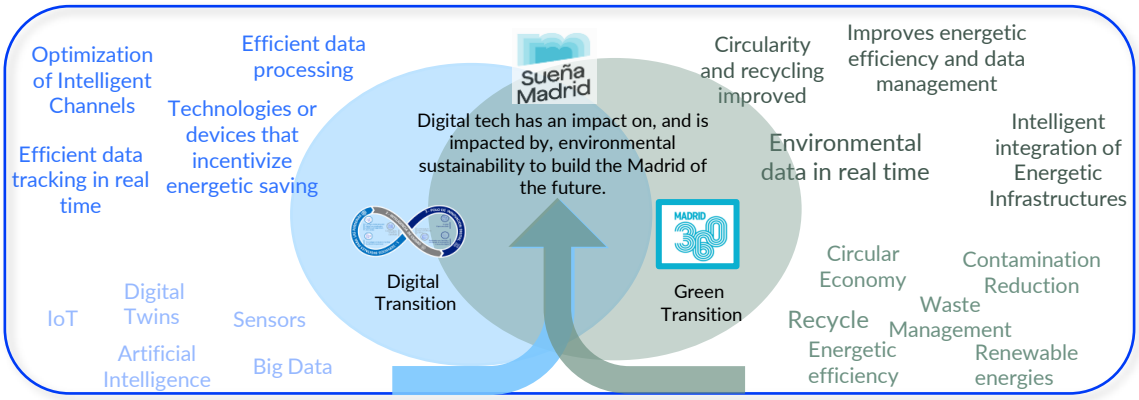
In this process, Madrid has been recognised in 2023 with the ***Climate Neutral and Smart Cities* seal** by the European Commission.
This recognition supports the successful development of the Madrid Climate Agreement, which defines the city's vision of climate neutrality and is accompanied by an action plan and investment strategy.
On the other hand, in 2023 the city launched the **Mobilities for EU** project, -funded by Horizon Europe. Led by the Digital Office and the Environment and Mobility Area of the city, it seeks to implement a smart urban system to promote mobility solutions towards climate neutrality. It includes connected autonomous electric vehicles, 5G coverage, renewable charging with artificial intelligence and digital twins.

The project developed in Mercamadrid integrates mobility, lighting and access solutions, together with an app to exchange surplus clean energy, seeking to alleviate congestion and add electric charging points.

Like these, the City Council promotes other projects supported by the national government and Europe, aligned with its Environmental Sustainability and Digital Transformation strategies.

These examples show that Madrid has already been making organic progress towards the ***Double Transition***, achieving environmental impacts based on the use of different technologies and digitalisation.

IMPACTS OF THE TWIN TRANSITION



The key elements of the **Madrid Digital Capital, Madrid 360 and *Sueña* Madrid** Strategies are presented bellow. These strategies drive the dual **green and digital transition**, maximising benefits for people, the environment and the city.

The Digital Transformation Strategy

Madrid, Digital Capital, is the strategy that the City Council has defined **to continue being a city of reference** in the digital sphere, **designed for people and companies** of Madrid, **for its neighbourhoods and districts, and for the City Council itself**, as a key driver of the city's digital transformation.

To make this a reality, different initiatives are being launched with an impact on all City Council Areas, with the aim of transforming the City Council's digital model through the incorporation of digital tools such as **artificial intelligence, automation, machine learning, IoT, 5G, etc.,** as well as **digital administration** projects that promote administrative efficiencies, or **inclusion and digital training**.

The elements of environmental impact are beginning to be included in the **Madrid, Digital Capital** strategy in two ways: firstly, by recognising the power of technology as **an enabling element** of the city's sustainability objectives **and a driver of the objectives of the green transition.**

Second, it represents an opportunity to **add sustainable aspects to the implementation of digital transformation**, ensuring that its effects and consequences are understood and controlled.

Thus, with the **update of the Strategy** (2025), work is being done on the definition of 6 new **digital strategic frameworks** as cross-cutting strategic planning instruments, aimed at collecting digital transformation trends and applying them to the reality of Madrid.

One of these itineraries is dedicated to the **twin transition** outlined in this document. It aims to maximise the potential of this dual relationship by incorporating it into the various digital transformation initiatives promoted by the city.

Likewise, in the update of the Strategy, the following axes that will be relevant for the city's double transition are strengthened:

Axis 1: The best digital administration with public employees as protagonists

Axis 2: Technology focused on making people's lives easier.

Axis 3: Safe, resilient and empowered city

Axis 4: Managed based on evidence and data

Axis 5: Hyperconnected city

Finally, and with the aim of **bringing citizens closer to this process of digital and sustainable transformation**, to understand how technology can improve their lives and environment, the City Council seeks to create interactive physical spaces, where the most relevant projects of the Digital Transformation Strategy can be presented. These **interpretation spaces** aim to bring technology closer to citizens, encourage their participation and promote the co-creation of digital services.

Accordingly, the **Green and Digital Transition Strategic Framework**, as part of the Madrid Digital Capital Strategy, aims to serve as a tool to enhance the positive impacts of both transitions and to mainstream its use in the different municipal interventions for which it is appropriate.

Madrid 360 Strategy

Madrid is undergoing an integrated transformation by betting on **green infrastructures** and modernising public action to improve the **quality of life of citizens** and create a **modern and enjoyable urban environment.**

The city has different initiatives focused on promoting **climate change mitigation and adaptation measures**, as well as making efficient use **of resources and protecting biodiversity**. The long-term goal is to transform Madrid into a more sustainable city from an environmental point of view, but also from a social, territorial and economic perspective.

The Madrid 360 Environmental Sustainability Strategy (2019) evolves over time, **combining the fight against climate change** with economic development and promotes the transition to city interventions as efficient air conditioning systems, fleet renewal and improvements in public transport and road safety based on innovation.

The **Roadmap to climate neutrality,** part of Madrid 360, has ambitious goals, such as reducing emissions by 65% by 2030 and achieving climate neutrality by 2050. This roadmap aligns municipal policies with the European Green Deal.

To address these challenges, Madrid has prioritised **air quality, mobility, the circular economy and waste management, and green and energy infrastructure.** Advances include the transformation of the entire city of Madrid into a **low emission zone (LEZ),** the implementation of the Traffic Complaints Alert System that alerts citizens of improper access to the LEZ, the promotion of public transport, the transition and new sustainable urban infrastructures that have led to results such as compliance with the European Air Quality Directive for the third consecutive year in 2024 and achieving historic lows of NO_2 in October 2024.

Madrid 360 is based on 6 strategic lines that complement each other: Sustainable Madrid, Efficient Madrid, Smart Madrid, Global Madrid, Healthy Madrid and Accessible Madrid.

"**Smart Madrid**" explicitly recognises technology and digitalisation as levers to achieve and accelerate the objectives set:

- Technology as a tool to promote public transport and intermodality.
- Monitoring of energy consumption of buildings and infrastructures to reduce them.
- Data and digitalisation to improve information and progress on air quality, regulations and the plan itself.

In addition, the **Strategy mainstreams digital tools** in the other strategic lines with initiatives of great relevance for the city such as:

- Increase the **efficiency of energy or material consumption** based on the use of data.
- Improve **efficiency in waste management** or the optimisation of mobility, *smartmobility and the mobility* 360 APP or the design of a predictive air quality system.
- Design and test **smart services** such as utility routes, traffic lights, park-and-rides, passenger mobility and freight loading. Smart and sustainable street lighting network, smart charging and unloading management.
- **More efficient and adapted use** of public services **by citizens**, with tools such as the reservation of parking spaces in the central district, *Mobility as a Service, Madrid Mobility 360 App.*
- Reduce travel and decongest spaces by promoting **teleworking**.

These positive impacts can continue to deepen as the double transition in the city is strengthened.

Sueña Madrid Strategy

In 2025, the city embarked on an ambitious integral planning project for the urban development of the city of the future. This project was based on a participatory process between the administration, companies, citizens and academia.

Sueña Madrid is the Platform to promote the **360 Urban Strategy**, the new planning framework that will replace the 1997 General Urban Development Plan. This initiative responds to the need to adapt the city to the great contemporary challenges: affordable housing, urban transformation and environmental sustainability.

It is structured around three main axes:

- **Affordable housing:** Promotion of new housing solutions that facilitate access to housing and attract talent.
- **Public space**: Transformation of the urban environment towards a greener, healthier and more accessible model.
- **Sustainability:** Integration of sustainability as a guiding principle of urban planning and its impact on quality of life.

These axes are developed through **nine urban challenges**, addressed through **thematic working groups**, among which those of **sustainability** and **innovation and digitalization stand out.**

The **Sustainability Roundtable** works on strategies for the following challenges:

- Achieve **climate neutrality**.
- Promote **energy efficiency** and **environmental regeneration**.
- Enhancement of blue **infrastructure**.
- Promote **sustainable, multimodal and intelligent mobility.**
- Improve **air quality.**
- Promoting the **circular economy**
- Integrating **sustainability criteria** into **urban design** and resource management

These actions are aligned with the **Madrid 360 Strategy**, which positions Madrid as a European benchmark in urban sustainability.

The **innovation and digitalisation** table has been key to imagining a city model based on **data, technology and innovation**, betting on a **smart, adaptable and people-centred city model.** It has included challenges around the following topics:

- **Open and real-time data** for urban decision-making.
- **Urban simulators**, **digital twins** and automated urban rules engines to anticipate future scenarios.
- **Interoperable digital infrastructure** and **data governance**.
- Application of emerging technologies such as **artificial intelligence, 5G** or **autonomous vehicles.**

This approach is articulated with the **Madrid City Council's Digital Transformation Strategy**, which includes projects such as: Digital Brain and Digital Twin of Madrid; Integral Citizen Platform; Madrid Móvil; Smart Urban Corridors or Cybersecurity Centers.

Beyond the specific tables, ***Sueña* Madrid** has identified projects and challenges that cross the areas of sustainability and digitalisation. Here are some examples:

- Interoperable digital mapping for urban planning.
- Single repositories of municipal data with clear governance.
- Urban laboratories to experiment with inclusive technological solutions.
- Smart and conversational GIS platforms for environmental management and mobility

These projects reinforce the vision of **Madrid as a collaborative city** and allow an effective alignment between ***Sueña* Madrid, the Madrid 360 Strategy and the Digital Transformation Strategy,** materializing the double transition of the capital.

Once the diagnostic phase is concluded, the strategy enters a stage that includes, among other things, the development of a Strategic Simulator with artificial intelligence and georeferencing to support urban planning. The initial approval of the new Plan is expected in 2027.

Intelligent Architecture Supporting Strategic Framework

The digitalisation and transformation of the city for the consolidation of a **smart and sustainable city** requires a **smart technological architecture of the city** that facilitates efficient management and allows responding to the changing needs of the city and its inhabitants.

The most relevant elements of the design of this architecture are outlined below:

Reference Intelligent Architecture Design:

A **comprehensive platform** to efficiently manage a smart and sustainable city must take into account several elements such as **data collection and analysis**, **system interoperability**, security and the dissemination of public information. The importance of **a modular and scalable infrastructure** that can adapt to the changing needs of a city by responding to the challenges of the **Smart and Climate Neutral Cities 2030 Mission** is also emphasized.

These elements will allow a **more efficient use of data and technology** seeking standardization, system integration, avoidance of duplication and adaptive scalability. Likewise, it allows the correct functioning of **high-impact digital solutions for the green transition** such as Smart Urban Spaces, the Digital Twin, Digital City Brain, among others.

Here are the **essential components and capabilities** that the platform must have to efficiently manage this double transition:

- **Sensorization and Data Collection:** Use of sensors to collect real-time information on various urban aspects.
- **Actuators for Automation:** Use of devices that perform automatic actions in response to the data received.
- **Big Data Management:** The ability to manage and analyse extensive data sets in real time.
- **Sensor Data Management:** Processes of storing, processing, and analysing collected data.
- **Automation and Intelligent Control**: Application of AI and machine learning technologies.
- **Support for Predictive and Prescriptive Analytics**: Tools to predict future trends and behaviours
- **IoT connectivity:** Implementation of networks of IoT devices that are interconnected, facilitating the monitoring and control of different aspects of the city in real time.
- **Semantic Data Models:** Use of standards to structure and share data, ensuring that information is consistent and understandable across different systems and services.
- **Network Connectivity and Communication:** Support for communication technologies such as IoT, 5G, 6G or WiFi.
- **Modular and Scalable Architecture:** Designed to adapt to growth and technological changes.
- **Security and Data Protection:** Implementation of strong security measures.
- **System Interoperability**: ability of systems and technologies to collaborate and share information through common interfaces
- **Maintenance and Continuous Updating**: Strategies to ensure that smart city infrastructure is kept up to date.
- **Accessibility and Citizen Participation:** ensure that technology is accessible to all citizens, promoting digital inclusion.

An **interoperable and modular architecture** that includes the elements described above will be a transcendental element insofar as it contributes to the objectives of this Framework by **optimising networks**, **intelligently integrating infrastructures** (for example, renewable energies, electric vehicle charging, smart buildings or sustainable mobility), contributing to the **efficient and unified processing of more data**, allow **real-time monitoring and follow up on environmental impact actions** in the city, among others.

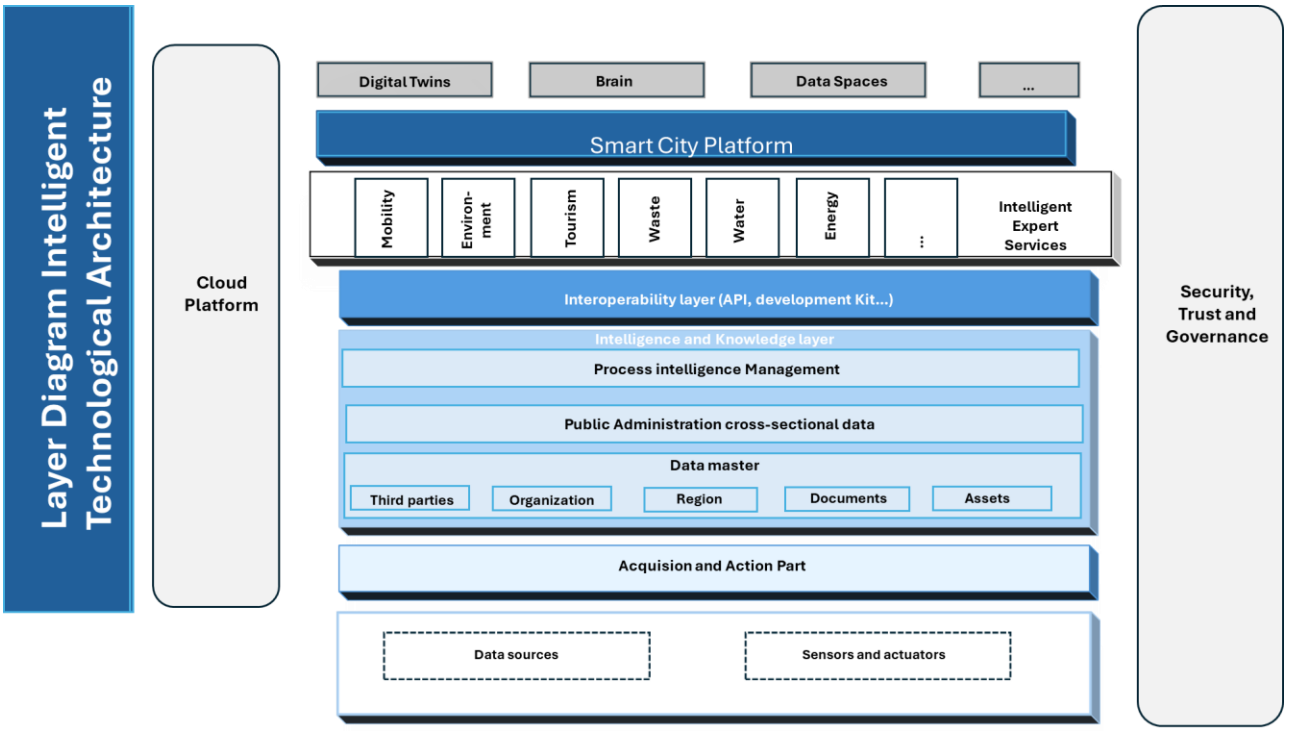
The City Council's Digital Office has proposed the City Intelligence Architecture structure in which the **necessary business layers, semantics and standardization are established, as well as** the definition of interconnection protocols between platforms, following the main standards and norms existing in the industry (UNE178104, EIRA (European Interoperability Reference Architecture), eGovERA,© Smart Data Models.)

This architecture seeks to respond to the different **challenges** of the city's systems and technologies:

- **Dispersed Systems Integration**
- **Adopt standards that enable interoperability between different platforms and services**
- **Maintenance and Scalability** to ensure that systems and technologies can adapt to the growth and evolution of the city.
- **Effective Governance Models** that allow efficient and participatory management of the smart and adaptive city.
- **Accessibility and Citizen Participation** to make technology accessible to all citizens, promoting digital inclusion.

Business layers of Smart City Architecture:

The city's intelligence architecture is structured in a **model of layers and subsystems** designed to facilitate the efficient management and operation of the city. It ranges **from data collection to the provision of intelligent services**, ensuring interoperability, information processing and security. Each layer fulfils specific functions, working in an integrated way to improve the quality of life of citizens and optimize urban resources

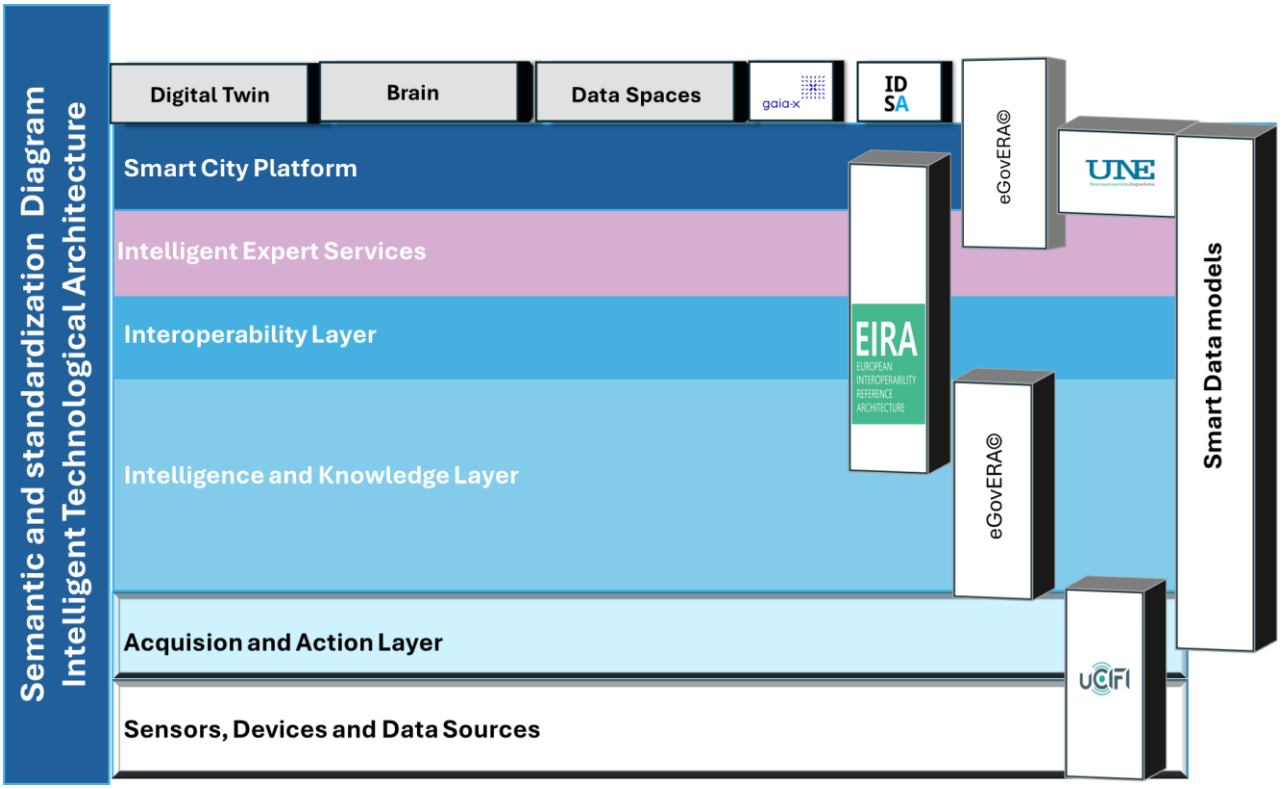


Semantics and standardization of Smart City Architecture:

Defining **semantics and standardization** in **Smart City Architecture** is essential to develop an **urban platform that is coherent, sustainable and efficient**. The adoption of **regulations and reference architectures**, including city semantics and the use of smart data contracts, makes it possible to build an advanced urban ecosystem where interoperability, governance, connectivity and sustainability are harmoniously integrated.

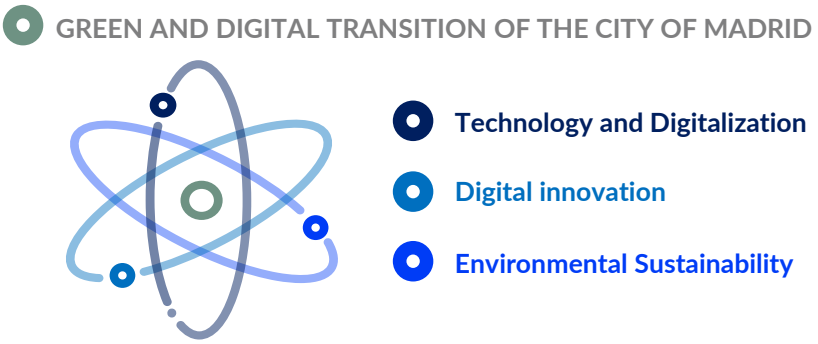
City **semantics**, by establishing a common language for the interpretation of urban data, facilitates interoperability between systems and reduces dependence on specific providers, promoting scalability and reducing the costs of integration and exchange of information. For their part, data smart contracts regulate and ensure the secure and efficient use of urban information, providing a reliable framework for data management.

Integrating these elements into the smart city platform not only optimizes its operability but also makes it more adaptable and able to respond to the changing needs of citizens. This approach ensures urban development that combines innovation and advanced technology with sustainability, aligning with the current dynamics and future demands of the urban environment.



Collaborative governance for the Strategic Framework

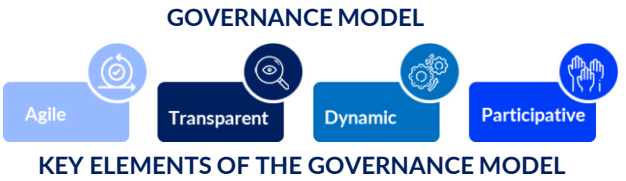
This Framework is built with a collaborative and cooperation perspective between areas: the **Digital Office**, as a promoter of the digital transformation of the city; the **IAM**, which manages actions related to information and communication technologies; the **Directorate-General for Innovation**, with the mission of establishing, developing and implementing policies to support innovation; and the **Government Area of Urban Planning, Environment and Mobility,** which, among others, has competence over the management of mobility, transport and parking, environmental control, green areas, waste management, environmental quality and sustainability. In the same way, the areas that are relevant according to the object of the projects to be developed will be linked. Each area contributes from its experience and the scope of its competence, enhancing cooperation to generate greater impact.



In this context, the proposed governance model is **agile, transparent and dynamic.** It allows contributions or suggestions to be included periodically from the different areas, following the European context and guaranteeing adaptation to different moments or events that take place during the implementation.

A group of inter-area experts is thus proposed to participate in the projects and establish their monitoring, to ensure the greatest possible efficiency for the benefit of citizens and the city itself.

This committee will take into account the following key elements for the double transition: **internal and external stakeholders, measurement of progress** with special emphasis on the double transition indicators proposed below, **incorporation of the needs detected** in the context of the double transition **and the emerging priorities** of the **areas of government,** the identification of **risks and deviations from the regulatory framework or the application of technology in projects**, the incorporation of **good practices** that are identified and dissemination at all levels (internal and interdepartmental and external to other public administrations, national and international).



KEY ELEMENTS OF THE GOVERNANCE MODEL

- **#01** Incorporation of Involved Agents
- **#02** Progress Measuring
- **#03** Incorporating the needs and priorities of government departments
- **#04** Identifying risks and deviations during implementation
- **#05** Incorporating identified best practices
- **#06** Disseminating information both interdepartmentally and to other public administrations

Indicators for the progress of the double transition

Both the green and digital transitions each have specific indicators that allow the impact and progress in their implementation to be measured and that must be included in the monitoring schemes of each project.

Green transition

The reduction of CO2 emissions, **use of renewable energies** or **energy efficiency**, percentage of **recycled or reused waste**, **water footprint**, **air quality**, etc., can be measured.

Digital transition

The level of digitalisation, **adoption of new digital technologies** (IoT, AI, Big Data...), reduction of **cybersecurity incidents**, **connectivity and internet access**, **process automation**, usability, etc. can be measured.

The **double transition** requires not only considering the **specific indicators** of both transitions for the assessment and monitoring of each project but also allows the incorporation of mixed indicators that allow the progress of a project to be measured through a joint vision that integrates this double perspective. For this reason, the following indicators will be incorporated in a complementary way to the above:

- **Impact of digitalisation on energy efficiency**: reduction of energy consumption and associated emissions thanks to the implementation of digital technologies in different processes, practices and activities.

  This impact can be related to the **reduction of energy consumption through efficient data management or virtual simulation**. For example, efficiency achieved through efficient and real-time monitoring and tracking, efficiency in processing large volumes of data, faster identification of problems and possible solutions or the possibility of testing solutions virtually through multiple digital technology solutions.

  These include server virtualization, infrastructure automation, migration to the cloud, sensorization for monitoring and management, etc., as well as efficiency improvements due to the **adoption of innovative alternatives that digitalization makes possible** (tools for remote work and coordination, awareness and empowerment of citizens in energy matters through applications for controlling energy consumption and generation, digital mobility tools as a service, digital solutions for sustainable logistics and product circularity, among others.
- **Reduction of the digital carbon footprint**: referring to the environmental impact and the amount of greenhouse gas emissions produced by the use of digital technologies and online activities, including the emissions generated throughout the value chain or life cycle of the implementation of technologies and devices, from their production and distribution to their use and disposal (use of resources in production and distribution, energy consumption of devices and servers, networks, data centres, etc.).
- **Incorporation of sustainability elements in digitalisation projects.** Integration of environmental data or inclusion of specific environmental objectives in each project. The City Council has an Environmental Public Procurement Catalogue with tools to support the incorporation of ecological criteria in the purchase of computer equipment and in physical interventions linked to digital projects. In addition, the IAM is making progress in the inclusion of performance and impact indicators in projects (e.g. % of devices with energy certification, average life of equipment before replacement, ratio of repairs to new acquisitions, % of equipment refurbished/reused, estimation of emissions avoided by life cycle extension).
- **Green and digital innovation:** number of projects or use cases that integrate digital innovations to improve environmental sustainability.
- **Adoption of sustainable practices in the use of devices or management of virtual information:** efficiency in data transmission and storage management, use of timers or sensors.

In addition, when incorporating monitoring and impact indicators in each of the specific projects for the development of this Framework, it is important to take into account elements of direct or indirect impact related to the **devices**, **network** or **cloud** necessary for **data** storage and processing. As a guide, the greatest impacts that technology and its value chain can have on the environment are presented as follows (JRC ICT Task Force study):

- Use of finite resources, including critical raw materials to produce devices.
- Energy consumption and GHG emissions from device production and use
- Air, soil and water pollution due to the extraction and processing of raw materials and hazardous substances used in production
- Generation of potentially hazardous electronic waste after its final disposal.

3.Structure of the Strategic Framework: Axes and Projects

Overview of the structure of the Strategic Framework

The **Strategic Framework for the *Green and Digital Transition*** is structured around **4 axes** that contain **23 digital transformation initiatives** with an impact on the city's green transition included in the **Madrid, Digital Capital Strategy**. These 23 initiatives represent only the starting point, and the development of the Framework will allow to continue strengthening the digital transformation of the city. For its part, the progress of the **10 transformative projects** of the **Madrid, Digital Capital Strategy**, integrating the principles of this Framework, will allow the definition of more projects or the adaptation of those with high potential to generate impacts aligned with the double transition.

4 AXES

23 INITIATIVES/ PROJECTS

10 TRANSFORMATIVES PROJECTS

4 AXES

E1. Smart and Adaptive Madrid

E2. Madrid Sustainable Digital Administration

E3. Madrid Green IT

E4. Madrid Talent and Collaboration for the Twin Transition

23 INITIATIVES/PROJECTS THAT MAKE THE FRAMEWORK A REALITY

#1. Smart and Adaptative Madrid

Digitalization for a viable, resilient and sustainable environment.

1. *Smart Lighting, Intelligent Services Enabler*
2. *Intelligent Management of Calle 30.*
3. *Smart urban spaces*
4. *Digitalization of air quality management*
5. *Digitalisation of green areas*
6. *Digital cleaning and collection management*
7. *Digital waste management*
8. *Intelligent traffic and mobility management*
9. *SMEs in the Twin Transition*

#2 Madrid Sustainable Digital Administration

Digital services for citizens that impact city efficiency.

10. *360 Sustainability Platform*
11. *Madrid is in your mobile*
12. *Digital Registry*
13. *Tax Digital Transformation*

#3. Madrid Green IT

Digital Infrastructure to evolve towards a digital and green model.

14. *Madrid's multicloud infrastructure*
15. *5G Madrid Agenda*
16. *Sensorisation of urban space and facilities*
17. *Data Governance*
18. *FabLab and SBN Lab of the Center for Innovation in Circular Ecoonomy of Madrid*
19. *Advanced workstation*

#4 Madrid Talent and collaboration for the Twin Transition

Training and collaboration for the appropriation of sustainable digitalization practices.

20. *Digital Talent Strategy of the Municipal Employee*
21. *Inclusion and Digital Training for All*
22. *Interpretation Centre: Digital Transformation in Action*
23. Madrid en Red *for Green and Digital innovation*

10 TRANSFORMATIVE PROJECTS OF THE DIGITAL TRANSFORMATION STRATEGY : on which the future evolution of the Framework is leveraged.

- Intelligent process management
- Integral Platform for the citizen
- Data Intelligence
- Digital Twin
- Artificial intelligence
- Smart urban spaces
- Digital Brain
- Inclusion and Digital Competences for All
- GovTech
- Cybersecurity

4 Axes on which the Strategic Framework and its projects are structured

Each of the **axes of the Framework** and the **projects or initiatives** of the Madrid Digital Transformation Strategy that make them a reality are presented below.

4 AXIS

- **E1.** Smart and Adaptative Madrid
- **E2.** Madrid Sustainable Digital Administration
- **E3.** Madrid Green IT
- **E4.** Madrid Talent and Collaboration for the Twin Transition

AXIS 1: Smart and Adaptive Madrid

Sustainable urban management is promoted **through digital solutions** in key areas such as mobility, waste management, natural conservation and climate monitoring.

The aim is to reduce environmental impact through disruptive technologies that optimise urban services and adapt to the needs of citizens and companies in the management of green areas, pollution and lighting.

Digitalization for a viable, resilient and sustainable environment.

PROJECTS

1. *Smart Lighting, Intelligent Services Enabler*
2. *Intelligent Management of Calle 30*
3. *Smart urban spaces*
4. *Digitalization of air quality management*
5. *Digitalisation of green areas*
6. *Digital cleaning and collection management*
7. *Digital waste management*
8. *Intelligent traffic and mobility management*
9. *SMEs in the Twin Transition*

AXIS 2: Madrid Sustainable Digital Administration

It focuses on offering **digital services for citizens and companies**, promoting digital administrative management in the City Council and reducing the need for face-to-face procedures. This reduces energy consumption, paper use, and emissions generated.

The aim is to guarantee digitally accessible municipal services, improving efficiency and agility and reducing environmental impact. In addition, the creation of interconnected and efficient services is supported, promoting interoperability and data management to optimize processes and resources in a sustainable way.

Digital services for citizens that impact city efficiency.

PROJECTS

10. *360 Sustainability Platform*
11. *Madrid is on your mobile*
12. *Digital Registry*
13. *Tax Digital Transformation*

AXIS 3: Madrid Green IT

This axis promotes **sustainable digitalisation** through efficient and environmentally friendly infrastructures and technologies, promoting the adoption of solutions that improve energy efficiency, reduce consumption and minimise environmental impact throughout their useful life, from manufacturing to disposal.

The aim is to influence implementation decisions, prioritising **technologies with a low carbon footprint**, as well as **green, circular and modular infrastructures** that support the City Council's services. The Framework also promotes **interoperable architectures and green algorithms** that optimise the use of resources for more efficient and sustainable management.

The ultimate goal is to reduce the energy consumption and carbon footprint of the equipment and ensure an efficient digital infrastructure that also improves services for the city.

This axis is complemented by axis 4, which raises awareness among those responsible about the environmental impact of technologies.

Digital Infrastructure to evolve towards a digital and green model.

PROJECTS

14. *Madrid's multicloud infrastructure*
15. *5G Madrid Agenda*
16. *Sensorisation of urban space and facilities*
17. *Data Governance*
18. *FabLab and SBN Lab of the Centre for Innovation in Circular Economy of Madrid.*
19. *Advanced workstation*

AXIS 4: Madrid Talent and collaboration for the Twin Transition

It promotes a **culture and digital talent aware of the challenges of sustainability**, with the aim of making the city and the City Council more sustainable, while working to close the digital divide and ensure that all citizens can fully participate in the digital society, leaving no one behind.

The axis focuses on **ensuring that citizens, companies and municipal employees adopt sustainable digitalization practices**. It seeks to increase awareness of the environmental impact of digital services, encourage more responsible use and support decision-making towards a more conscious digitalization.

In addition, it seeks to promote **collaboration** between the Madrid City Council and European, national and local entities to accelerate the green and digital transition through the exchange of good practices and participation in strategic initiatives to consolidate Madrid as a city of reference in sustainable digital transformation, learning from and adopting experiences shared by other cities.

Training and collaboration for the appropriation of sustainable digitalization practices.

PROJECTS

20. *Digital Talent Strategy of the Municipal Employee*
21. *Inclusion and Digital Training for All*
22. *Interpretation Centre: Digital Transformation in Action*
23. *Madrid en Red for Green and Digital Innovation*

The details of each of these projects can be consulted in the last point of this section "Detail of the 23 projects that develop the 4 axes".

10 transformative projects of the Madrid, Digital Capital Strategy

Within the **Madrid Digital Transformation Strategy,** at least **10 transformative projects** are identified, which are positioned as **levers** to **promote Madrid's development** towards its goal of being **a climate-neutral and environmentally sustainable city.**

These projects promote, on the one hand, **digitalisation as an enabler of positive impacts on the green transition**, since the different technologies allow greater efficiencies and accelerate the progress of actions thanks to the following uses:

- **Efficient, real-time monitoring and tracking**.
- **Efficiency** in **processing** large volumes of **data**.
- **Faster identification** of **problems** and possible solutions.
- **Simulation and forecasting**. Test solutions virtually improves efficiency.

On the other hand, during its implementation, it seeks to take into account the element of **sustainability to mitigate the effects in terms of energy consumption and carbon footprint** that digital transformation may bring. Thus, during the implementation of these projects, digital technologies and efficient and circular equipment will be promoted**, the implementation of green algorithms, and an interoperable and modular city architecture will be sought**.

These projects have been selected and defined with the aim of **comprehensively addressing the set of economic, social and environmental dimensions** with the aim of maximising the benefits that can be reverted both to citizens, companies and to the City Council itself in order to ensure an **efficient, effective, sustainable and especially equitable transition**

Due to their **scope**, these projects affect **all the Government Areas of the Madrid City Council in a transversal way**.

Thus, **the City Council's roadmap towards the *Green and Digital Transition* is strengthened with elements of these 10 projects** to face future challenges in terms of sustainability and aims to strengthen the inventory of the **23 projects or initiatives** initially identified as part of this Framework.

The 10 projects are listed below, emphasizing their ability to promote a comprehensive and sustainable change in municipal management, in order to position the Madrid City Council as one of the benchmarks in terms of the digital and green urban transition:

TRANSFORMATIVE PROJECTS

Intelligent Process Management

Integral Platform for the Citizen

Data Intelligence

Digital Twin

Smart Urban Spaces

Digital Brain

Inclusion and Digital Competences for All

GovTech

Cybersecurity

Artificial intelligence

Detail of the 10 transformative projects

This projects are the driving force behind many of the 23 projects in this Framework and have the potential to generate greater impacts on the green transition according to their application in different initiatives of the City Council.

#01. INTELLIGENT PROCESS MANAGEMENT

DESCRIPTION

Modular digital administration solution for City Councils, which offers integrated management of procedures in an efficient and automated way. Its objective is to provide the City Council with an integral platform to design, configure and implement administrative processes quickly and centrally. Intelligent process management helps reduce energy, paper and emissions consumption, while optimizing processes and improving the efficiency of digital infrastructures through integration and interoperability.

#02. INTEGRAL PLATFORM FOR CITIZENS

DESCRIPTION

A single point of access to municipal information and services, so that omnichannel can be developed from there and is reinforced with the Digital Wallet. The creation of these spaces reduces consumption, emissions and enables predictive maintenance of services, based on data, which allows the number of incidents and interruptions in services to be reduced/mitigated, leading to smarter, more efficient and sustainable municipal management.

#03. DATA INTELLIGENCE

DESCRIPTION

Evolve the Madrid City Council towards a data intelligence Administration, one that understands its data as a strategic asset for decision-making, with the aim of positioning itself as a smart city and serving for decision-making in favour of sustainability, as well as improving the monitoring and follow-up of the city's actions.

Optimising energy consumption in buildings, efficiently managing public transport, reducing emissions through data-driven urban planning and optimising waste management are examples where comprehensive data-driven management can have a significant impact on the city's green transition

#04. DIGITAL TWIN

DESCRIPTION

A crucial tool for modern urban management. These virtual representations of the city will allow the City Council to carry out precise and detailed planning, helping to ensure efficient and effective management of the territory. It allows simulating the environmental impact of urban projects before their execution, identifying designs that reduce emissions or resource consumption. For example, it can help shape vehicular circulation, optimize the energy efficiency of buildings, manage water resources, monitor air quality, and predict infrastructure maintenance, among other uses.

#05. SMART URBAN SPACES

DESCRIPTION

Design and construction of more connected, sustainable and citizen-centred urban environments in the city of Madrid. The specific objectives that guide this vision are the creation of hyper-connected spaces, intelligent and sustainable management of urban spaces, providing valuable services for citizens and municipal services, improving coordination and response to people's needs.

#06. DIGITAL BRAIN

DESCRIPTION

Monitoring and Follow-up Centre, in real time, of the operation of the City and municipal services, which integrates the set of command centres of the different services of the City Council to ensure their efficiency. It helps to manage the city more efficiently, sustainably and resiliently by promoting the optimization of resources by integrating the different command centres, improving the capacity to carry out real-time environmental monitoring or strengthening prediction.

#07. INCLUSION AND DIGITAL COMPETENCES FOR ALL

DESCRIPTION

Strengthening the digital skills of citizens and public employees, incorporating sustainability as a principle to be taken into account in Digital Training actions, to raise awareness of the sustainable use of ICTs and the opportunities of technology for sustainability.

#08. GOVTECH

DESCRIPTION

To promote in Madrid the sector of digital technologies applied to the search for solutions to the challenges of the City, to the improvement of public services and municipal modernization whose improvements impact the sustainability of the city. To this end, through different initiatives, the innovative potential of Madrid's digital startups and SMEs, the capabilities of the City's technology companies, and the knowledge and experience of municipal staff will be combined. Govtech's approach in Madrid can transform the city into a model of environmental sustainability, combining technology, innovation and collaboration to create solutions that improve efficiency, reduce ecological impact and promote greener and more responsible urban development.

#09. CYBERSECURITY

DESCRIPTION

Protect citizens and the administration from those risks derived from digitalisation in the Digital Transformation Strategy of the Madrid City Council. To this end, digital interconnection and process automation are promoted, improving efficiency and quality of life. In addition, cybersecurity promotes digital efficiency by building trust in systems that optimize municipal services. It protects these systems, ensuring continuity of operations, security of sensitive data, and protection of critical infrastructure, such as power grids, public transportation systems, and traffic management.

#10. ARTIFICIAL INTELLIGENCE

DESCRIPTION

Promote the transformation of the urban management model through the adoption of artificial intelligence, as a key tool to improve digital services and attract investment, innovation and talent. To this end, it is essential to promote its use both in companies and in the Public Administration. The City Council seeks to ensure that AI systems are developed with safety and sustainability criteria, assessing the value of the investment in the cloud in terms of speed, cost and quality. In addition, the use of more efficient models that reduce computing capacity is promoted, thus contributing to energy and environmental sustainability. AI can also generate positive impacts by predicting energy consumption patterns, optimizing traffic, facilitating environmental monitoring, or supporting sustainable urban planning.

23 projects that develop the 4 axes of the Strategic Framework

Axis 1: Smart and Adaptive Madrid

Digitalization for a viable, resilience and sustainable environment

#1. SMART LIGHTING, ENABLER OF INTELLIGENT SERVICES

DESCRIPTION

Incorporate technology and digital services into the lighting infrastructure, which allows coverage for the deployment of an IoT communications network that, complemented by elements such as actuators and road presence sensors, allow the hyperconnectivity of the entire city, facilitating the energy transition and building a new energy model for the city.

#2. INTELLIGENT STREET 30 MANAGEMENT

DESCRIPTION

Consolidation of the digitalisation of the M-30 as an infrastructure with referenced technology in terms of safety and resilience, mobility, energy, sustainability, efficiency and innovation, through the incorporation of new broadband services in tunnels, 5G, IoT, edge computing, artificial intelligence, etc.

#3 SMART URBAN SPACES

DESCRIPTION

Advanced management of municipal buildings through the installation of sensors and actuators, as well as the application of technology to improve energy efficiency and the holistic management and maintenance of building facilities, their security and access control. A new model of governance of municipal buildings resulting from the use of the opportunities of the application of technology. The creation of a virtual replica of municipal buildings is contemplated to carry out simulations between scenarios and predictions of the impact of projects for the adaptation of uses and installation of equipment, facilitating the identification of the best alternatives. This initiative will be supported by the Digital Twin for the representation of buildings, the City platform, the IoT network, etc.

#4. DIGITALIZATION OF AIR QUALITY MANAGEMENT

DESCRIPTION

Full digitalisation of the Integral Air Quality Monitoring, Prediction and Information System through its integration into corporate platforms for the management of electronic assets distributed throughout the City and the standardised use of artificial intelligence and advanced analytical techniques for the simulation of measurements, monitoring and improvement of air quality. Reuse of integration with the neutral, open and interoperable Internet of Things network and with the City platform.

#5. DIGITALISATION OF GREEN AREAS

DESCRIPTION

Optimisation of the management of municipal woods and gardens and reinforcement of maintenance and cleaning services through IoT and City management platforms, which allow the improvement of the service (SmartPark & SmartTree). Configuration of spaces in the parks for citizen experimentation with the digitised services of the City: lighting, installations, equipment, furniture, etc.

#6. DIGITAL CLEANING AND COLLECTION MANAGEMENT

DESCRIPTION

Incorporation of digital solutions that allow the modernization of the complete management of urban cleaning and collection with the aim of making the current cleaning and waste collection processes more efficient, improving the quality of the environment and increasing the well-being of all citizens. It will incorporate solutions based on emerging technologies (IoT, AI, 5G, etc.) as well as robotization and automated management, or the use of autonomous vehicles and equipment.

#7. DIGITAL WASTE MANAGEMENT

DESCRIPTION

Improvement of the whole management of urban waste with the aim of optimising recycling processes, improving the environment and guaranteeing the well-being of all Madrilenians. It can be achieved through solutions based on emerging technologies (IoT, AI, 5G, etc.) and progressively incorporating robotization and automated management, as well as autonomous vehicles.

#8. INTELLIGENT TRAFFIC AND MOBILITY MANAGEMENT

DESCRIPTION

Application of emerging technologies to improve urban mobility and road safety. Constant and real-time monitoring of Madrid's streets, obtaining data with the aim of offering personalised solutions to drivers through Madrid Mobility 360 and incorporating the connectivity capabilities of the 5G and IoT agenda and state-of-the-art technologies such as edge computing, artificial intelligence, blockchain and extended reality.

#9. SMES IN THE TWIN TRANSITION

DESCRIPTION

Evolution of micro-SMEs and SMEs in Madrid towards a green and digital model, promoting their sustainability, through the implementation of digital technologies to build a climate-neutral Madrid and taking advantage of the opportunities of the green deal and the European digital agenda. A strategic and operational framework will be developed to translate the European strategic objectives for the digitalisation of professionals, including concrete measures to adapt to the green and digital transition. It is an integral part of the program for the promotion of Govtech.

Axis 2: Madrid Sustainable Digital Administration

Digital services for citizens that impact city efficiency.

#10. 360 SUSTAINABILITY PLATFORM

DESCRIPTION

Madrid Mobility 360. Transport information platform that offers a comprehensive view of Madrid's mobility in real time and integrates cutting-edge technologies to offer innovative solutions (increased efficiency, cost reduction, etc.). It also provides customizable services such as (smart route selection or real-time traffic updates) and can manage access to mobility systems, as well as payment methods.

#11. MADRID ON YOUR MOBILE

DESCRIPTION

Direct, easy, comfortable and fast access to all municipal and city services from your mobile phone; facilitating the co-creation and co-design of digital services, from and through the users' own experience, and facilitating the co-production of information and management through the figure of the citizen as a prosumer of services. Having virtual access to different municipal services makes it possible to reduce the impact of the provision of services in terms of paper use, energy consumption or reduction of GHG emissions by avoiding unnecessary transfers.

#12. DIGITAL REGISTER

DESCRIPTION

Digitalisation of the management and processing of the services provided by the municipal register, incorporating the automation of processes and promoting administrative simplification and the reduction of administrative burdens. The development of the project allows registrations and modifications of the register to be made by electronic means. It promotes the reduction of the use of paper in the management of procedures, as well as encourages the reduction of GHG emissions due to unnecessary journeys avoided.

#13. DIGITAL TAX TRANSFORMATION

DESCRIPTION

Incorporation of the latest technologies for the optimization of tax management with the aim of expanding capacities and enhancing revenue generation and advancing in tax modernization that in turn impacts on administrative efficiency with potential impact on energy consumption and resource savings. To this end, a tax laboratory has been created focused on the use and advanced processing of data, taking advantage of the opportunities of technologies such as the Internet of Things, artificial intelligence and virtual reality.

Axis 3: Madrid Green IT

Digital Infrastructure to evolve towards a digital and green model

#14. MADRID MULTICLOUD INFRASTRUCTURE

DESCRIPTION

Municipal data processing and storage to ensure the availability and security of digital services. Optimisation of the storage of all municipal information and improvement of data analytics and exploitation thanks to secure, resilient, scalable and open environments. The city's data transition to data centres and public cloud meets energy efficiency and sustainability criteria and ensures that it hires companies with zero or negative carbon footprint commitments.

#15. AGENDA 5G MADRID

DESCRIPTION

Facilitate and promote the deployment of 5G networks, infrastructures and services. Configure an open and interoperable network, reinforced with 5G, to facilitate the IoT, ensuring that the City's assets are connected and monitored and smart management is incorporated. This technology allows for greater efficiency in terms of bits of data per kilowatt while consuming less energy. In addition, its ability to connect sensors in real time allows the management of urban infrastructures such as traffic or lighting to be optimised, promoting energy savings or reducing emissions.

The platform for managing the information generated on the network and a laboratory will also be created to test and verify the adequacy of projects and their devices, including the promotion of mission-oriented innovation.

#16. SENSORIZATION OF URBAN SPACE AND FACILITIES

DESCRIPTION

Management of municipal urban spaces and facilities through sensorisation, to know their status, situation, consumption and automation, and facilitate their maintenance and cleaning by means of technological tools and systems that allow the optimisation of the service. This project responds to the needs of scaling the functional scope of the Internet of Things network, smart lighting, smart buildings and other projects in which the connection of devices favours the optimization of service management.

#17. DATA GOVERNANCE

DESCRIPTION

Design, development and implementation of data governance in Madrid City Council and its evolution, as well as the provision, in coordination and collaboration with the services provided by Madrid City Council's IT Department (IAM), of the technological infrastructure to support it. Good data governance improves sustainability by eliminating unnecessary data, reducing energy consumption, and allows resources to be optimised through reliable data and automation that in turn meets sustainable criteria in its development.

Axis 3: Madrid Green IT

Digital Infrastructure to evolve towards a digital and green model

#18. FABLAB AND SBN LAB OF THE CIRCULAR ECONOMY INNOVATION CENTER OF MADRID

DESCRIPTION

Interdisciplinary community around **Digital Manufacturing Technology and the Circular Economy and Nature-based Solutions** with the aim of creating a node of knowledge that has a favourable impact on society and the economy of Madrid. It is part of the CIEC Madrid, based in Vicálvaro, which represents an ambitious and concrete step in the development of Circular Economy actions and initiatives, and places Madrid at the forefront of the undertakings of the transition towards a sustainable model of production and consumption.

#19. ADVANCED WORKSTATION

DESCRIPTION

The project promotes the **modernization and sustainability of the municipal workplace**, integrating both the digitization of tools and the training of personnel. A **complete training plan** will be implemented that includes digital skills in cybersecurity, data protection, use of collaborative platforms, analytics and team management in hybrid or remote environments.

A hardware life cycle policy based on sustainability criteria is also incorporated, which includes: **preventive and corrective maintenance** to extend the useful life of the devices; **reparation versus substitution**, with measurable objectives; **refurbishment and internal reuse** prior to removal; safe **recycling and waste** electrical and electronic equipment management procedures; and **green purchasing** criteria (energy efficiency, reduced carbon footprint).

Axis 4: Madrid Talent for the Twin Transition

Training for the appropriation of sustainable digitalization practices

#20. DIGITAL TALENT STRATEGY FOR MUNICIPAL EMPLOYEES

DESCRIPTION

It includes the challenges in terms of the talent needed for digital transformation and sets out the main areas to be developed around it. The proposal for the profile of the desired municipal staff is constructed, the priorities for action to achieve it are defined and the pillars and lines of action to achieve it are proposed. Digital training must include elements for the municipal employee to understand how to make sustainable use of devices and efficient ways of working online, as well as the environmental implications of different technologies or the correct disposal of technological waste.

#21. INCLUSION AND DIGITAL COMPETENCES FOR ALL

DESCRIPTION

Project to mobilise and energise the city's digital training ecosystem to promote digital inclusion and independence and the employability of citizens. It also seeks to integrate and value the public-private capacities and strengths of the city and strengthen data and monitoring of digital gaps and skills. It promotes the Digital Volunteering project and the Citizen Awareness Plan for the use of the digital channel and is executed from a public-private alliance of the city. Digital training not only involves increasing digital knowledge and skills, but it also involves understanding some of the most relevant environmental impacts in order to become digitally competent and responsible citizens.

#22. INTERPRETATION CENTRE: DIGITAL TRANSFORMATION IN ACTION

DESCRIPTION

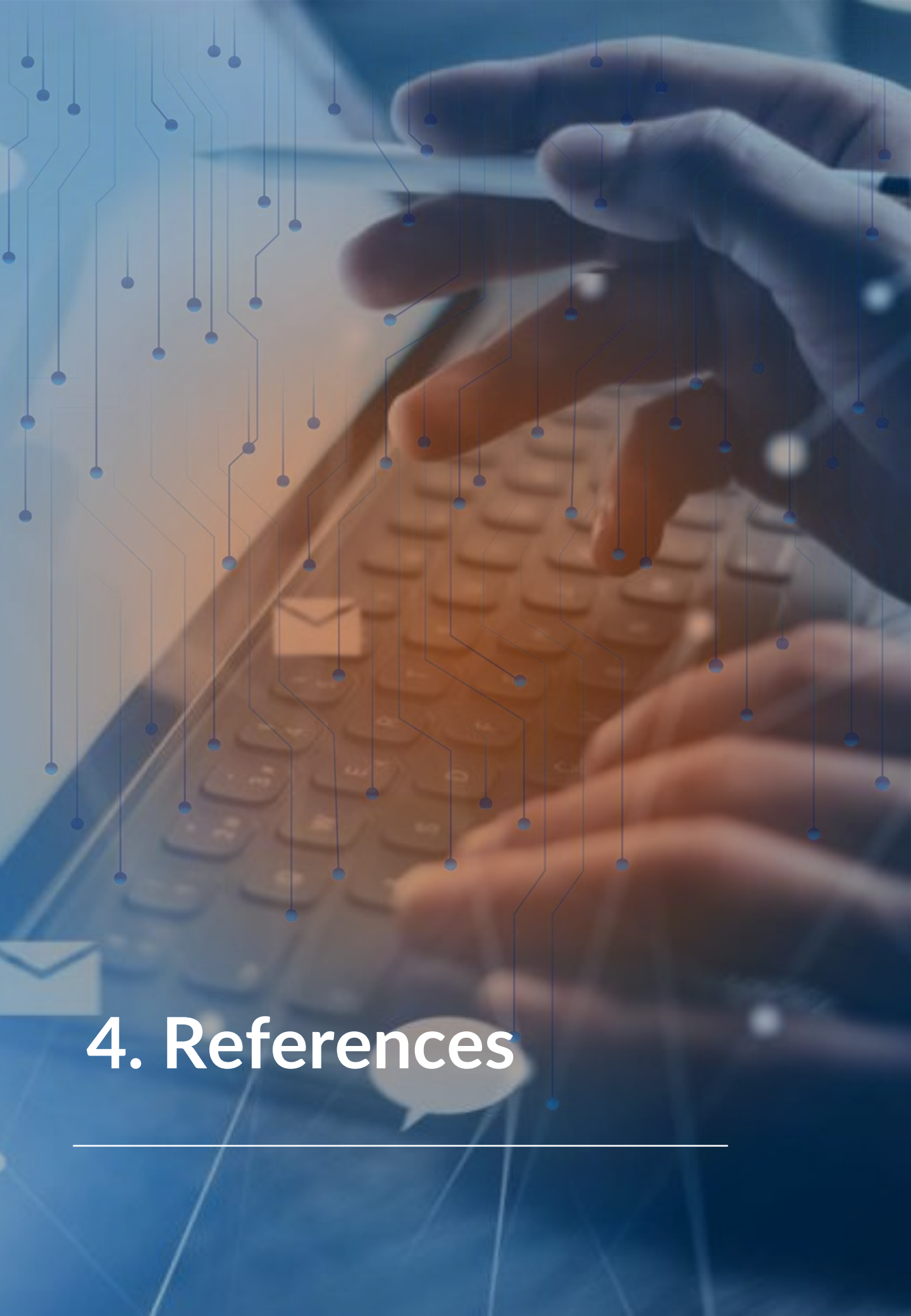
Interactive demonstrator of the most relevant projects of the Digital Transformation Strategy and all its technological and sectoral tools with an impact on environmental sustainability, as a space to bring technology closer to citizens, encourage their participation and promote the co-creation of digital services. It will be accompanied by a **classroom to dynamize digital knowledge** and talent **and an intelligent urban space** in the surroundings, which deploys the different services that make Madrid a digital, sustainable and enjoyable city

#23. *MADRID EN RED* FOR GREEN AND DIGITAL INNOVATION

DESCRIPTION

Promote an active collaboration network between the Madrid City Council and European, national and local entities to accelerate the green and digital transition through the exchange of good practices, joint projects and participation in strategic events.

Madrid is positioned as a leading city in sustainable digital transformation, promoting new urban dynamics while learning, adapting and amplifying the experiences shared by other cities and international networks.



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