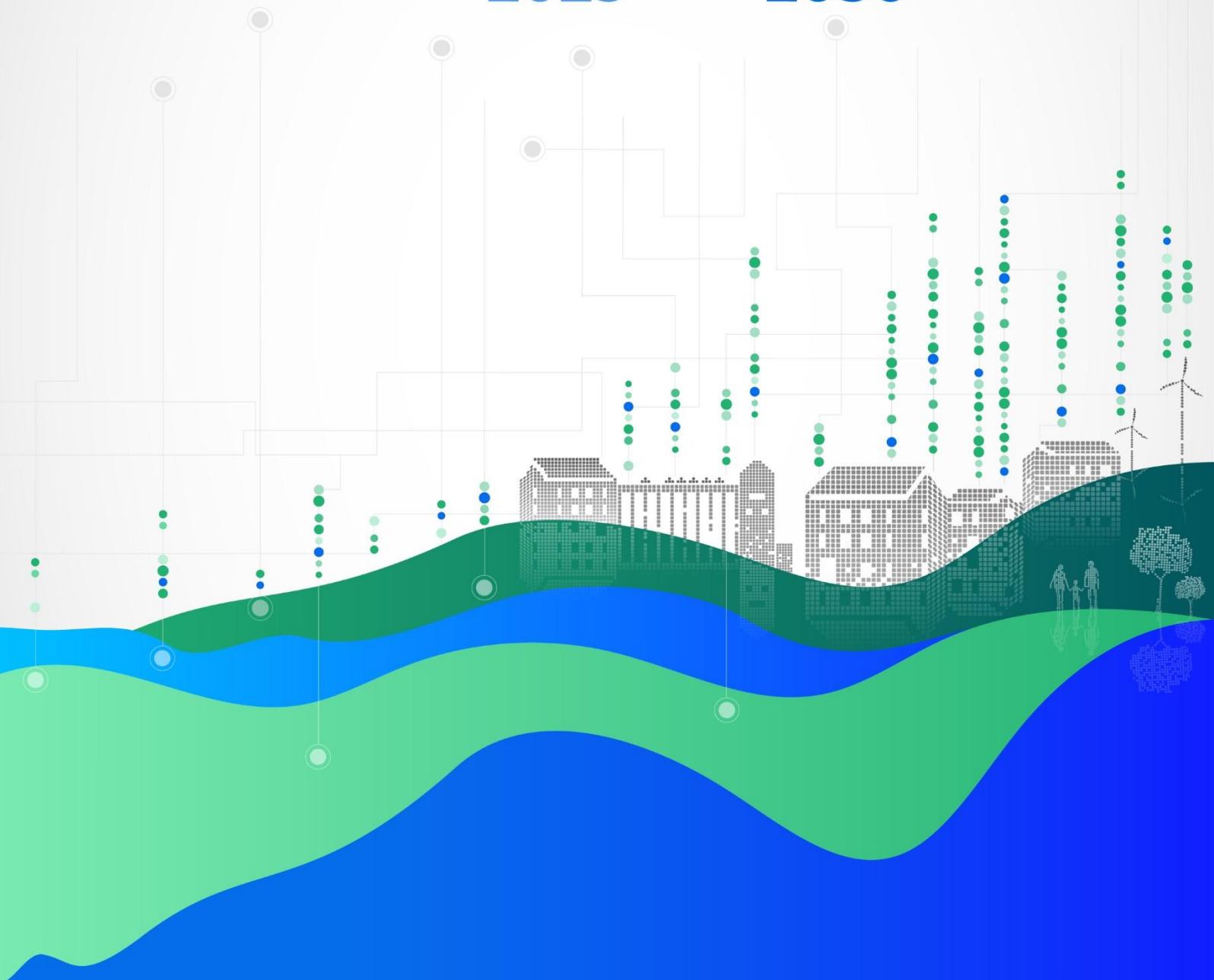




ENTi

ESTRATÉGIA NACIONAL
DE TERRITÓRIOS INTELIGENTES

2023 — 2030





Technical Data Sheet

TITLE

National Smart Territories Strategy

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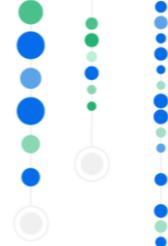


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National Smart Territories Strategy

The National Smart Territories Strategy is a measure provided for in Pillar III – Digitalisation of the State, part of the Action Plan for the Digital Transition, approved by Cabinet Resolution no. 30/2020 of 21 April 21, and in the Programme of the 23rd Constitutional Government, as a measure to serve as a catalyst for the digital transition, within the scope of the digital society, creativity and innovation, as a strategic challenge.

Following the same train of thought, this Strategy is also a relevant public policy instrument for the pursuit of the Sustainable Development Goals (SDGs) of the 2030 Agenda for sustainable development, namely SDG 7 (Affordable and Clean Energy), SDG 9 (Industry, Innovation and Infrastructure), SDG 11 (Sustainable Cities and Communities), SDG 13 (Climate Action) and SDG 17 (Partnerships for the Goals).

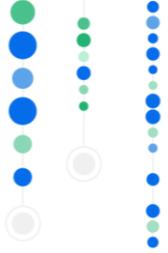
In this context, in which Portugal has been positioning itself as an innovative and entrepreneurial country, with a growing focus on the areas of technology, digitalisation and sustainability, the development of smart territories appears as an opportunity to boost the country's progress and competitiveness, whilst simultaneously promoting social and territorial cohesion and the continuous improvement of public services.

The national, regional and municipal challenges are distinct and depend on their characteristics. However, there are other trends present across the national context and which may guide the actions of municipalities, namely, an increasingly ageing population which requires a growing healthcare offer, or the increase in global warming which leads to a greater recurrence of extreme environmental events and rising sea levels. It is this set of challenges that calls on local, regional and national decision-makers to increasingly reinforce the purpose of providing services in an efficient, inclusive and quality manner.

It is essential for the country to have a strategy which serves as a reference for implementing the vision of smart territorial development defined for 2030, bringing together a set of guidelines to speed up the transformation of Portuguese municipalities. A national strategy aimed at smart and connected territories which provide inclusive and sustainable economic development, with interoperable services focused on citizens and companies, which position Portugal as a digital country.

Through the National Smart Territories Strategy, strategic objectives and initiatives are defined, as well as recommendations for local actions, which aim to promote coordinated and collaborative implementation amongst those responsible for national, regional and local institutions, involving the active participation of other agents, such as academic institutions, profit and non-profit organisations, and individuals, in the pursuit and evaluation of initiatives.

Concurrently, the importance of transparent accountability and the continuous evaluation of the actions implemented is boosted.



Hence, under the terms of paragraph g), article 199 of the Constitution, Cabinet Resolution no. 176/2023 of 18 December, approved:

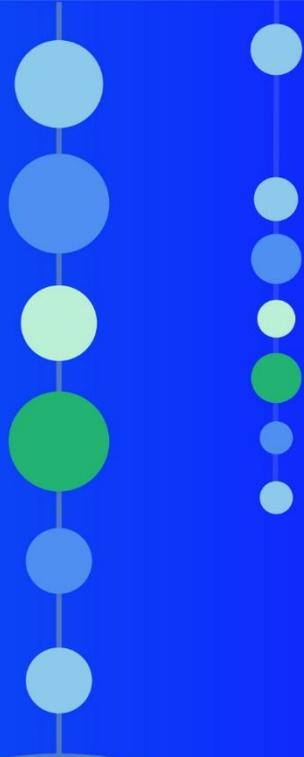
- The National Smart Territories Strategy (ENTi), set out in this document;
- The ENTi Action Plan for the period between 2023 and 2030 (Annex II);
- The Reference Architecture for Urban Management Platforms (ARPGU) (Annex III).

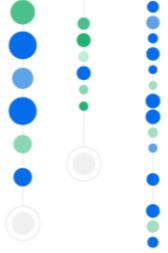
It also determines that, in 2026, an interim assessment of the ENTi will be carried out and the Action Plan and ARPGU will be reviewed.

It establishes that no additional remuneration or allowances have been earned for the performance of duties within the scope of the ENTi.

It defines that administrative and logistical support is provided by Agência para a Modernização Administrativa, I.P..

ENTI BACKGROUND





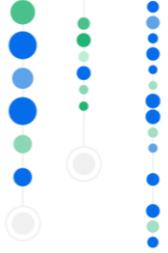
1. ENTi Framework

Adopting this strategy, the Government intends to project the country internationally in terms of territorial intelligence policies, adopting a clear global vision: to have smart and connected territories that provide inclusive and sustainable economic development, with interoperable services focused on citizens and companies, which position Portugal as a digital country.

The National Smart Territories Strategy (ENTi) is based on a diagnosis of the maturity and digital intelligence of Portuguese territories and an international benchmarking study. This study which benefited from the Technical Support Instrument of DG REFORM of the European Commission - was coordinated by the Portugal Digital Mission Structure and cooperation was provided by representatives of government areas and entities which formed the working group, formalised under Order no. 1369-A/2022 of 1st February.

The process involving a reflection on the Smart Cities (SC) ecosystem in Portugal revealed a set of realities that ENTi aims to address, namely: i) the absence of a common national strategy, general objectives and action plan to implement smart territories at regional and local level in Portugal; ii) the lack of mechanisms that promote synergies between actors and the sharing of experiences and lessons learned; iii) the need for integrated planning and optimisation of public expenditure associated with investments of this type and expansion of small-scale pilot projects at national level; and, finally, iv) the need to create an interoperability benchmark and common principles that apply to all smart territories in Portugal and their respective initiatives.

ENTi is thus based on a set of guiding, transversal principles that also serve as guidelines for its operationalisation, namely: i) having a citizen-centered approach; ii) capitalising on good practices identified as a starting point; iii) communicating and directing actions towards results; iv) promoting inclusion and cohesion based on a bidirectional logic; and v) having local action, with global thinking and a focus on the long-term.



ENTI's success is based on a set of premises, whose assurance throughout its implementation is essential, in order to ensure its materialisation and the respective action plan, namely:

- 1** Collaboration and cooperation at national, regional and local levels
- 2** Resilient, pragmatic and multi-level support
- 3** Political action leveraged in strategy communication
- 4** Inclusive financing, aligned with national needs
- 5** Transversal training and education
- 6** Value-added services and information based on interoperable platforms interoperáveis

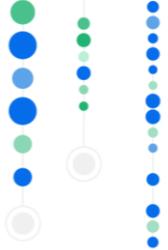
The main aim of the introductory chapter is to familiarise the reader with the document presented, setting out its framework within the National Smart Territories Strategy, and providing bases that clarify the understanding and rationale for developing this reference architecture.

Hence, the objectives and organisation of the document are set out first, followed by the identification of the bases for defining the taxonomy and key concepts used in the reference architecture.

Finally, the literature that served as the basis for this document is identified, highlighting a set of European and international studies, initiatives and projects, as well as international recommendations and standards.

REFERENCE FRAMEWORK





2. Reference framework

ENTI follows a conceptual and methodological framework which holistically integrates the various analysis blocks of a Smart Territories ecosystem, systematising the global vision defined for ENTI.

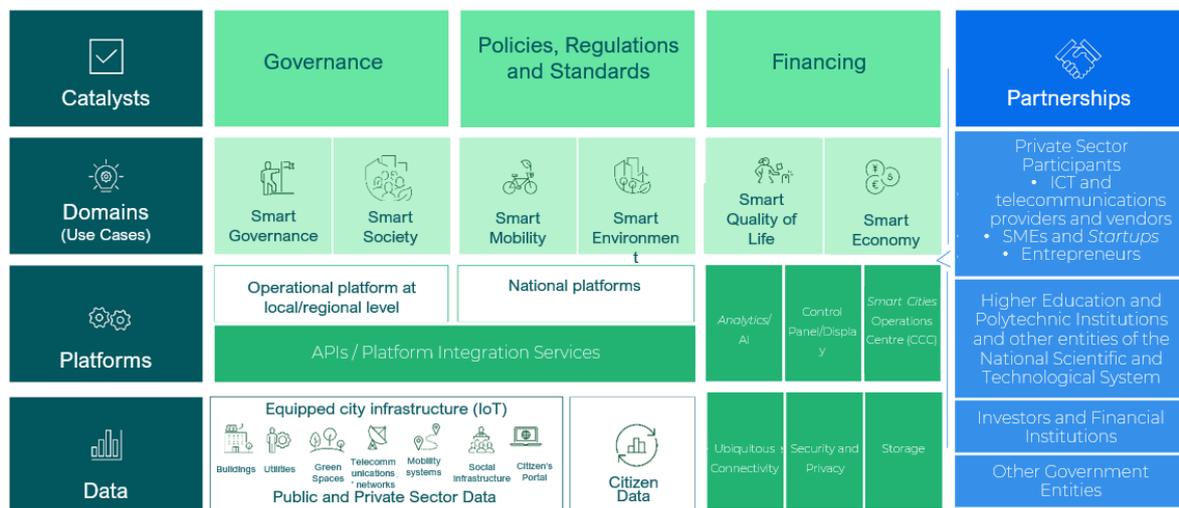
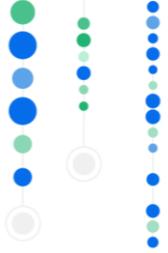


Figure 1 - Conceptual and methodological scheme of the reference framework which systematises the interactions between the various analysis blocks of the ecosystem underlying ENTI.

In light of the broad «Smart City» concept defined by the European Commission – i.e. “a place where traditional networks and services become more efficient through the use of digital solutions to the benefit of their citizens and businesses” – there are six key development domains around which use cases are generated, namely: smart governance, smart society, smart mobility, smart environment, smart quality of life and smart economy.

Local efforts which result in projects or use cases in SC domains in a given territory can be leveraged and adapted to meet the larger scale needs of the country. The evolution of an ecosystem of smart territories towards a smart national ecosystem thus requires a national transformation process which includes urban and non-urban areas, demanding strong cooperation between all relevant actors, an alignment between national interests and priorities, of the public sector, companies and society, and integration and interoperability between territories in order to create value and improve people's quality of life.

Contributing to this evolution will be emerging technologies, such as 5G, the *internet of things* (IoT), *cloud*, *edge computing*, augmented and virtual reality, artificial intelligence (AI), digital twins, multiverse and advanced analytics, which will amplify the strategic drive to transform territories. 5G can and should speed up territorial cohesion through a closer Public Administration, which provides public services with solutions and channels adapted to local circumstances. By combining the possibility of measurement



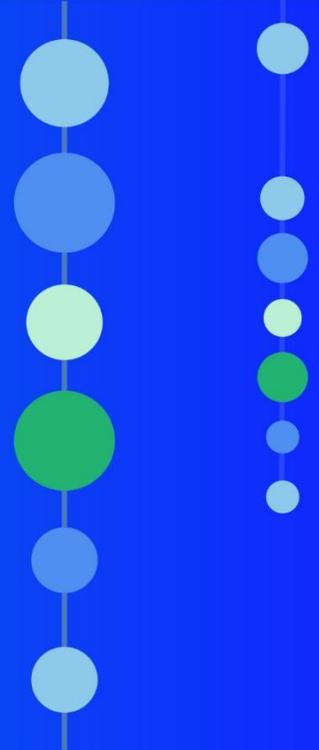
in IoT, the capacity for advanced data analysis and processing, and the integration of AI models for knowledge extraction, leveraged in the massive transmission of information in real time (5G), there is an expectation of the creation of conditions for speedier, more effective public management – in decision-making – and which is also more efficient – in the life cycle of public resources. 5G will thus make a decisive contribution in the future to cutting the opportunity cost of having a country with different speeds which, combined with *edge computing*, will create opportunities to improve digital experiences, support data security and enable continuous operations across industries.

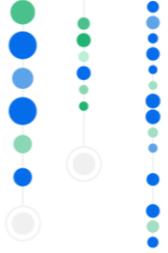
To leverage these projects at a national level, it is necessary to activate a set of catalysts. These catalysts include: the creation of a governance structure with qualified resources and a clear definition of the roles and responsibilities of the entities operating in the ecosystem; the existence of coherent and robust policies, regulations and standards that can be applied in the context of smart territories, as well as available financing mechanisms and partnerships between the various entities in the ecosystem; and also a technological dimension - which includes data and platforms -, essential for the development of the urban environment with a view to enhancing the response to citizens and mitigating the environmental impact. This technological side includes the aggregation of data and associated processes (collection, processing, storage, use and sharing) on integrated platforms, ensuring the interoperability of the various relevant systems in this context, through application programming interfaces (APIs) and integration services.

STRATEGIC OBJECTIVES



3





3. Strategic objectives

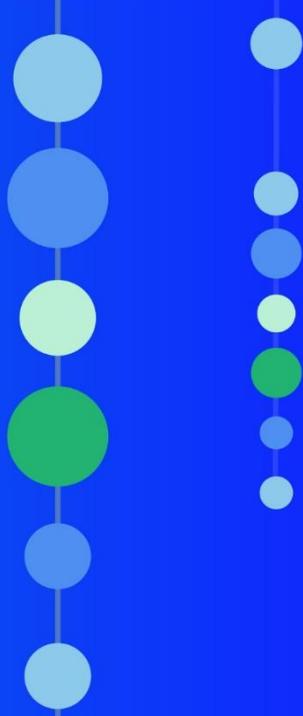
To achieve the 2030 vision, we have set **six strategic objectives** nationwide, which are transversal to the various catalysts for smart territories identified in the aforementioned reference framework:

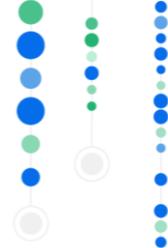
<p>1</p> <p>Promote sustainable territories that promote climate action with a focus on citizens' quality of life</p>	<p>2</p> <p>Increase multi-level collaboration and interoperability</p>	<p>3</p> <p>Fomentar uma economia competitiva avançada em tecnologias digitais</p>
<p>4</p> <p>Facilitate access to information and good practices via a Smart Territories Portal</p>	<p>5</p> <p>Promote leadership, talent and skills in Smart Territories</p>	<p>6</p> <p>Be an international reference for <i>Smart City</i> infrastructure, data and services</p>

STRATEGIC INITIATIVES



4





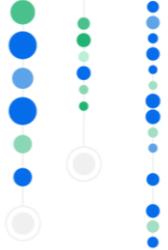
4. Strategic Initiatives

In order to achieve ENTi's strategic objectives, as referred to in no.3, and to support the action plan detailed in Annex II, sixteen strategic initiatives have been defined, within each of the analysis blocks/catalysts of the reference framework referred to in no. 2.

Each initiative is assigned an entity responsible for ensuring its implementation and monitoring, in close coordination with the other entities participating in the initiative.

Strategic Objectives

Domains	#	Initiative	Strategic Objectives						Entity (ies)
			1	2	3	4	5	6	
Governance	1	Communicate and implement a multi-level governance model	x	x			x		AMA ¹
	2	Create the Smart Territories Portal - a central repository of information essential to the national ecosystem				x			AMA
	3	Training for territorial intelligence and sustainability					x		INCoDe.2030 ²
Policies, Regulations and Standards	4	Map and centralise the legal and regulatory framework			x	x			EMPD ³
	5	Boost Technological Free Zones			x	x			ANI ⁴
Financing	6	Ensure the allocation of the necessary investment and financing	x	x	x	x	x	x	AMA, EMPD, Management Authorities of PT2030 ⁵
Partnerships	7	Enhance national, regional and local cooperation, as well as at a European and international level	x	x		x	x		AMA and EMPD
	8	Facilitate partnerships with the public and private sector		x	x		x	x	AMA, EMPD and INCoDe.2030
Data and Platforms	9	Promote the implementation of urban management platforms (PGU)		x			x	x	AMA
	10	Foster the development of digital twins	x	x	x		x	x	AMA
	11	Reuse and evolve existing solutions		x		x		x	AMA
	12	Ensure communication and implementation of ARPGU governance principles		x		x	x	x	AMA



Domains	#	Initiative	1	2	3	4	5	6	Entity (ies)
Data and Platforms	13	Leverage the catalogue of <i>Application Programming Interfaces (APIs)</i>		x		x		x	AMA
	14	Promote the availability of data in an open system		x				x	AMA
	15	Promote the use of the “Internet of Things” (<i>IoT</i>) communications and technology infrastructure				x		x	ANACOM ⁶
	16	Leverage privacy and cybersecurity maturity at local, regional and national levels				x		x	CNCS ⁷

Table 1 - Strategic initiatives within each of the analysis blocks of the reference framework to be implemented by ENTi

Notes:

¹AMA - Agência para a Modernização Administrativa, I. P.;

²INCoDe.2030 - National Initiative for the Promotion of Digital Competencies e.2030;

³EMPD – Portugal Digital Mission Structure;

⁴ANI - National Agency for Innovation;

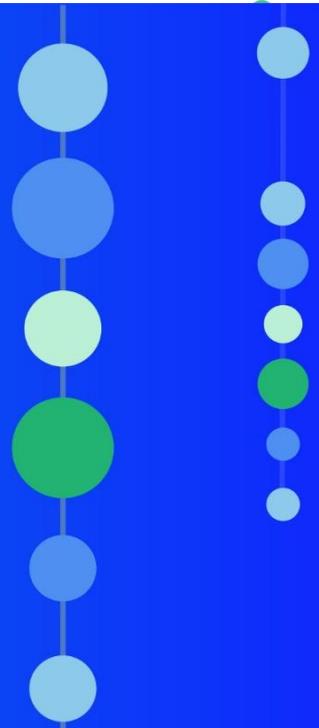
⁵PT2030 – Portugal 2030;

⁶ANACOM – National Communications Authority;

⁷CNCS – National Cyber Security Centre.

RECOMMENDATIONS

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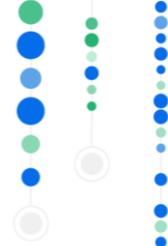


5. Recommendations

Based on the domains previously identified and the transversal blocks of strategic vision and the technological dimension, thirty-one recommendations are drawn up at a local level. These recommendations constitute a set of tools to guide local authorities and intermunicipal entities in developing their respective strategies. The application of the recommendations can be adjusted by the local authority and/or Intermunicipal Communities/Metropolitan Areas (CIMs/AMs) in line with their maturity, and they must be integrated into their local plans.

Domains	#	Recommendation
Strategic vision	1	Create local and regional strategies/action plans focusing on SC domains, aligned with inter-municipal, regional and national objectives and priorities
	2	Adapt national guidelines and develop a local governance model (e.g. a structure dedicated to territorial intelligence)
	3	Set up partnerships between local authorities and other entities in the ecosystem in order to boost and standardise national maturity
Smart governance	4	Enhance access to digital public services, portals and integrated applications, with the preferential use of Public Administration reference architectures
	5	Enhance open governance initiatives by promoting and leveraging the participa.gov portal, and encouraging citizen engagement in <i>living labs</i>
Smart society	6	Promote the empowerment of society through the education system and digital inclusion and literacy initiatives
	7	Promote health promotion and social inclusion activities, in order to promote the adoption of healthy lifestyles and the prevention of risk behaviours, as well as the requalification of socially excluded people and actions within the scope of the social support network.
	8	Using digital platforms to appeal to citizens to vote
Smart Mobility	9	Promote the investment and development of smart infrastructures and systems
	10	Drive forward smart and sustainable mobility methods
	11	Promote mobility using low-carbon fuels and electric mobility, in terms of the charging infrastructure, incentives and the fleet.
	12	Encourage the use of public transport, making it more sustainable and efficient
Smart Environment	13	Promote the creation of accessible, inclusive and green public spaces (urban gardens) and the energy and environmental sustainability of buildings, as well as the use of natural-based structures (e.g. green roofs), contributing to health and well-being.

Domains	#	Recommendation
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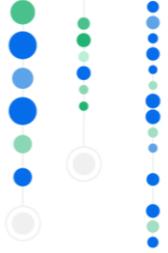


Smart Environment	14	Promote the circular economy covering the entire life cycle of products
	15	Promote the production and use of renewable energy sources, and promote the production of energy from agricultural and forestry surpluses
	16	Promote sustainable multipurpose public lighting
	17	Promote efficient water supply management with integrated systems
	18	Promote the monitoring of air quality, climate, noise and harmful gas emissions with integrated systems
	19	Promote efficient waste management with integrated systems
Smart quality of life	20	Implement partnerships between municipalities and health entities, in alignment with the National Health Plan 2030 and Local Health Plans, helping to improve the health of populations and strengthening the accessibility, efficiency and differentiation of the provision of local health care (telehealth, teleassistance)
	21	Create integrated systems for protection, security and emergencies, from a predictive and reactive perspective, in alignment with national guidelines
	22	Promote affordable and intergenerational housing
	23	Include culture, art and sport as dimensions of urban and territorial planning
	24	Promote energy communities
Smart economy	25	Enhance the attractiveness of municipalities for new residents, families and the business sector by promoting residence and investment in the territories
	26	Support the local economy through initiatives that promote the services and products of micro-enterprises, small traders and SMEs
	27	Promote entrepreneurship and innovation in the territories by supporting entrepreneurs in the region
	28	Boost Research and Development through the development of hubs and technological, creative and innovation infrastructures and testing and experimentation spaces
	29	Promote the region as a tourist destination of choice in order to attract national and foreign visitors
Technological side	30	Enhance the implementation of PGU and the provision of data in an open regime, as well as technology and communication infrastructures
	31	Strengthen cybersecurity, attack prevention and privacy, leveraging synergies with competent entities at a national and international level

Table 2 - Recommendations to local authorities and intermunicipal communities/metropolitan areas

FINANCING



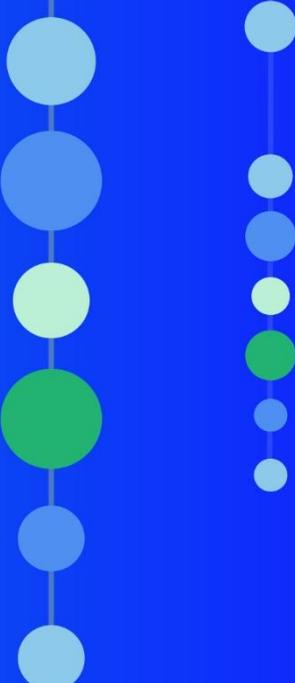


6. Financing

The responsibility for implementing ENTi is ensured within the context of local, regional and national funding, with the support of European funds, namely the Recovery and Resilience Plan and the Portugal 2030 programmes.

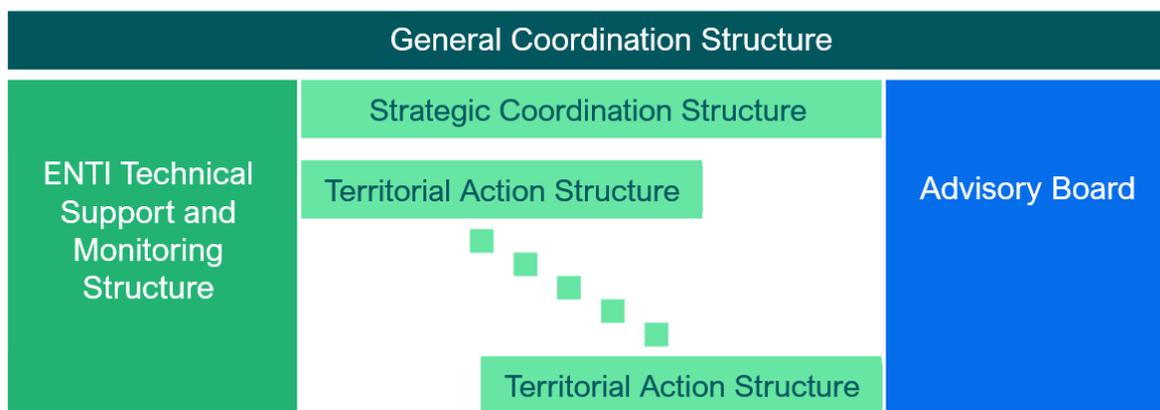
In this context, it is essential that the entities involved in the implementation of the ENTi foresee and continually ensure funding to develop the ENTi, with the implementation of the measures depending on whether there are funds available to this end by the entities involved, with the common goal of Portugal being a smart country.

GOVERNANCE



7. Governance

Given the nature of the ENTi, the following **governance model** is adopted for its implementation:



A governance model based on four levels of coordination – general, strategic, territorial and technical support and monitoring – and an advisory body, known as the advisory council.

7.1. Composition and competencies

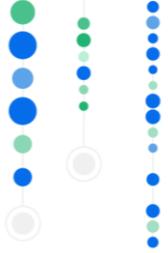
7.1.1. A general coordination structure (ECG), made up of the members of the Government responsible for the areas of digitalisation and administrative modernisation, which it chairs, and territorial cohesion. ECG is responsible for:

- a) Monitoring and evaluating the implementation of ENTi;
- b) Ensuring the appropriate allocation of resources for the implementation of ENTi.

7.1.2. A strategic coordination structure (ECE), comprising the members of the Government responsible for the areas of digitalisation and administrative modernisation, which it presides over, regional development, local authorities, the environment, urban mobility, energy and climate, infrastructure, the economy, tourism, trade and services, planning, security/safety and civil protection and health, which may also invite members of the Government responsible for other government areas or other public or private entities to participate in its meetings, when justified. The ECE meets at least every quarter and it is responsible for:

Defining and reviewing policies and guidelines associated with ENTi;

- a) Leading political and strategic management, ensuring the coherence of its application with national and European strategic guidelines, and the coordination and stepping up of synergies with other public policies;
- b) Setting priorities, making strategic decisions and identifying, where necessary, legislative changes aimed at simplifying, digitising, modernising and making territories smarter, or any other objectives deemed to be relevant;

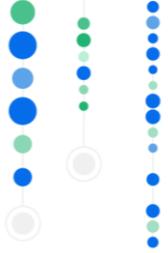


- c) Monitoring any challenges faced in transformation processes and incorporating any lessons learned, identifying priority areas of action;
- d) Promoting partnerships with national and/or foreign entities that can serve to boost the national ecosystem in the development of territories as well as promoting national solutions in the external space;
- e) Convening the Advisory Board with the relevant participants, depending on the area under discussion, and defining guidelines based on the support and opinions issued by them.

7.1.3. A technical support and monitoring structure (EATA), comprising a permanent team from Agência para a Modernização Administrativa, I.P., with a view to providing technical expertise, coordinating and monitoring effectively and continuously, in order to ensure the successful implementation of ENTi at national level. EATA is responsible for, in particular:

- a) Communicating and promoting ENTi, the action plan and the ARPGU, as well as any other instruments that may be defined, vis-à-vis all the stakeholders;
- b) Coordinating with the territorial action structure and stakeholders, with a view to monitoring the progress of the strategy in the territories;
- c) Issuing guidelines to implementing entities in order to clarify and/or harmonise procedures within the scope of ENTi implementation;
- f) Ensuring the monitoring of the implementation of ENTi and compliance with objectives, indicators and targets through the filing of an annual report;
- g) Implementing partnerships with national and/or foreign entities under the guidance of ECE;
- h) Drafting monitoring and progress reports on the implementation of the ENTi and submitting them to the ECG, with the frequency defined by the ECG;
- i) Proposing initiatives and changes in ENTi, to ECG;
- j) Design the system for verifying compliance of urban management platforms in line with the reference architecture in force;
- k) Disclosing and keeping updated the requirements for the interoperability interface of urban management platforms, based on ARPGU, and also producing, updating and disclosing the catalogue of data models for smart territories;
- l) Preparing the Strategy's interim review report in 2026 and reviewing the Action Plan to be in force until 2030.

7.1.4. A territorial action structure (EAT), broken down into the regions of North, Centre, Lisbon and Tagus Valley, Alentejo, Algarve, Madeira and Azores, made up of the chairmen of the Regional Coordination and Development Commissions (Comissões de Coordenação e Desenvolvimento



Regional, I.P.- CCDR, IP) and the Steering Committees of the Management Authorities of the regional programmes for the mainland of PT 2030, which they preside over, Intermunicipal Communities, Metropolitan Areas, local authorities and other public and private entities essential for the implementation of the ENTi. The responsibility for convening meetings lies with the chairman. The EAT meets at least every two months and it is responsible for:

- a) Adapting the ENTi to the specific needs of its territory by identifying, together with the EATA, the priority recommendations and initiatives included in the strategy or others;
- b) Proposing local initiatives and identifying opportunities for the development of smart territories;
- c) Promoting ENTi and coordinating with all regional and local stakeholders, the implementation of initiatives with a view to making the territory smart;
- d) Ensuring funding for identified recommendations and initiatives;
- e) Coordinating and implementing initiatives and pilot projects at regional level;
- f) Monitoring and reporting to EATA about the progress and challenges of ENTi implementation at regional and local levels.

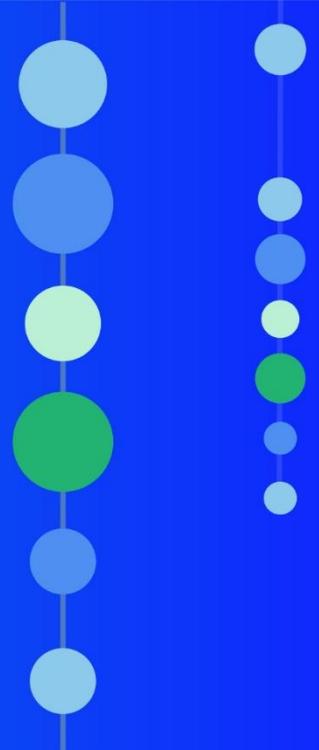
7.1.5. An advisory board, comprising representatives of public and private entities, civil society organisations, non-governmental organisations, as well as external experts, representatives of services, institutions, personalities or entities of recognised merit, within the scope of smart territories. The Advisory Board is appointed by the ECG, on a proposal from the EATA, and it is responsible for:

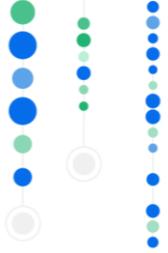
- a) Monitoring ENTi progress;
- b) Issuing opinions on any matters submitted to it;
- c) Presenting, on its own initiative, recommendations, suggestions or priority areas of intervention within the scope of ENTi's work, with a view to achieving the goal of a smart country.

STRATEGY MONITORING



8





8. Strategy Monitoring

ENTi monitoring and evaluation plays a crucial role in ensuring effective monitoring and the success of initiatives. The ENTi Action Plan envisages the development of a system for monitoring ENTi based on clear indicators, measurable targets, regular assessments and the active participation of stakeholders. This system will ensure the transparency, accountability and adaptability required to achieve the strategic objectives set.

The monitoring and evaluation of the recommendations will be supported by a set of recommended indicators and sub-indicators, associated with each intervention domain, with identified data sources.

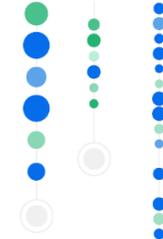
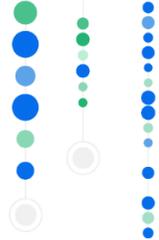
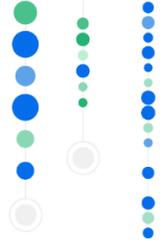


Table 3 - Indicators for monitoring and evaluating the implementation of ENTi in terms of recommendations to Municipalities and CIMs/AMs

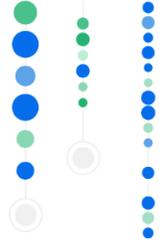
Domain	Indicator	Sub-indicator	Description	Source
Smart Environment	Smart buildings	Sustainable buildings	Rate of rehabilitated or new buildings with energy certification at levels A+, A, B and B-	Energy Certification System Database
			Rate of installations with Smart Metering Equipment or <i>smart meters</i>	E-Redes Open Data
	Resource management	Energy	Use of technology or interconnected systems in consumption management (e.g. smart meters, smart grids, consumption of renewable energy, promotion of energy communities etc.)	IUTIC ¹ - Local Councils (DGEEC ²)
			Domestic consumption of electricity per inhabitant (kWh/inhab.) by place of residence	INE ³
			Energy produced using biomass (GWh/year)	DGEG ⁴
		Carbon footprint	Greenhouse gas emissions measured in tonnes per capita (ISO 37120: 8.3)	APA ⁵ (national inventory of greenhouse gas emissions)
		Air quality	Air quality index	APA (QualAR - Air Quality Information System)
			Use of interconnected air quality measurement technology or systems (e.g. air quality control, identification of pollutant emission points, pollen and particle level alerts etc.)	IUTIC - Local Councils (DGEEC)
		Waste production	Proportion of urban waste prepared for reuse and recycling (%)	INE (National Institute of Statistics)
			Urban waste collected per inhabitant (kg/inhabitant)	INE (National Institute of Statistics)



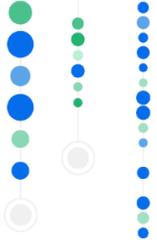
Domain	Indicator	Sub-indicator	Description	Source
	Resource management		Deployment of technology or interconnected waste management systems (e.g. smart solutions aimed at optimising the waste collection and treatment process etc.)	IUTIC - Local Councils (DGEEC)
		Water consumption	Deployment of technology or interconnected systems to monitor infrastructures related with consumption (e.g. water distribution and drainage, water collection and treatment, drinking water supply etc.)	IUTIC - Local Councils (DGEEC)
			Water distributed per inhabitant (m ³ / inhab.)	INE (National Institute of Statistics)
	Sustainable urban planning	Density	Population density (no./km ²)	INE (National Institute of Statistics)
		Climate Resilience Strategy	Municipal climate action plan available	IUTIC - Local Councils (DGEEC)
Smart Mobility	Efficient transportation	'Green' transport	Provision and location of electric vehicle charging stations	IUTIC - Local Councils (DGEEC)
			Charging points by number of electric and hybrid <i>plugin vehicles</i>	MOBI.Data (from MOBI.E)
	Multimodal access	Public Transport	Percentage of sustainable commuting (walking, public transport, metro, train, bicycle, boat)	INE (National Institute of Statistics)
			Deployment of technology or interconnected systems for mobility management (e.g. public transport network, integrated ticketing systems, pedestrian infrastructure, cycling networks etc.)	IUTIC - Local Councils (DGEEC)
	Technological infrastructure	Access to information in real time	Dynamic monitoring of vehicle and pedestrian traffic, and real-time action at traffic lights	IUTIC - Local Councils (DGEEC)



Domain	Indicator	Sub-indicator	Description	Source
Smart Governance	Online services	Online procedures	Availability of mobile applications to people	IUTIC - Local Councils (DGEEC)
		IoT	Municipalities that use interconnected devices or systems that can be monitored or controlled remotely through the <i>Internet of Things</i> (IoT)	IUTIC - Local Councils (DGEEC)
		Integrated operations	Integration of services into a single operations centre with real-time monitoring	IUTIC - Local Councils (DGEEC)
	Open government	Open data	Provision of open data	IUTIC - Local Councils (DGEEC)
			Use of open data	IUTIC - Local Councils (DGEEC)
	Smart Economy	Entrepreneurship and Innovation	Startups	Number of new startups created/year
Research & Development			Research and development expenditure (R&D - €) of institutions and companies with research and development by Geographic location (NUTS - 2013) and implementation Sector	DGEEC (INE)
Digital Commerce			Rate of SMEs with at least basic digital intensity	IDES ⁶
			SMEs selling online	IDES
Smart Society	Inclusion	Internet connection	Fixed broadband Internet access per 100 inhabitants	INE (National Institute of Statistics)
			Students using computers with internet connection in primary and secondary education	DGEEC
	Civic Space	Civic participation	Existence of electronic platforms for civic participation (Y/N)	IUTIC - Local Councils (DGEEC)
			Voter turnout in local elections	SG MAI ⁷



Domain	Indicator	Sub-indicator	Description	Source
Smart Society	Education	Digital Competencies	Percentage of population with digital skills above basic	IDES
		Higher Education	Higher education enrolment rate of resident population aged 25-64 by place of residence (NUTS - 2013)	INE (National Institute of Statistics)
Quality of Smart Life	Creativity	Employment in creative industries	Cultural employment	INE (National Institute of Statistics)
	Culture and Well-being	Quality of life	Well-being index	INE (National Institute of Statistics)
		Investment in culture and sport	Local councils' expenditure on culture and sport out of total expenditure (%)	INE (National Institute of Statistics)
	Crime	Smart crime prevention	Deployment of technologies in crime prevention (e.g. video cameras in <i>livestreaming</i> , crime prediction software etc.)	IUTIC - Local Councils (DGEEC)
	Security	Civil Defence	Investment in warning systems for populations to protect from serious accidents and disasters	Municipalities
	Health	Municipal Health Strategy	Number of Municipalities with published Municipal Health Strategy and established Municipal Health Councils	DGS ⁸ /ARS ⁹
		Public spaces promoting physical activity which are accessible and inclusive	Number of spaces, footpaths and cycle paths as an action to promote different forms of active and healthy mobility	DGS/ARS
		Access to health	Number of female and male doctors per 1000 inhabitants by place of residence (NUTS - 2013)	INE (National Institute of Statistics)
		Alcohol and tobacco consumption amongst the adolescent population	Prevalence of recent alcohol and tobacco consumption amongst the adolescent population (%)	SICAD ¹⁰



Domain	Indicator	Sub-indicator	Description	Source
Quality of Smart Life	Health	Mortality	Infant mortality rate (‰) by Place of residence (NUTS - 2013)	INE/DGS
			Maternal mortality rate per 100,000 live births	INE/DGS
			Standardised mortality rate per 100,000 inhabitants, from all causes and by major groups	INE/DGS
		Life expectancy	Healthy life expectancy at birth and aged 65	INE (National Institute of Statistics)

Notes:

¹IUTIC - Survey on the Use of Information and Communication Technologies;

²DGEEC – Directorate-General for Education and Science Statistics;

³ INE – National Institute of Statistics;

⁴DGEG - Directorate-general of Energy and Geology;

⁵ APA – Portuguese Environmental Agency;

⁶IDES - Digital Economy and Society Index;

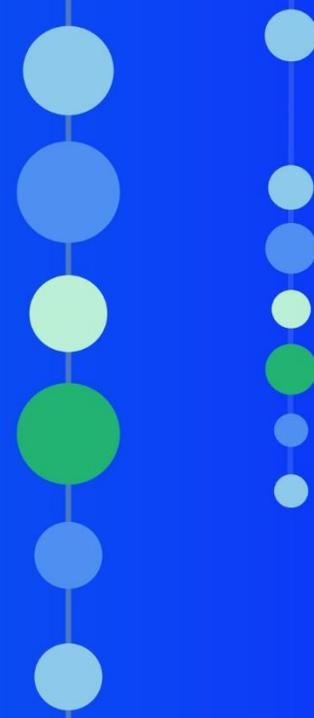
⁷SG MAI – Secretariat-General of the Ministry of Internal Affairs;

⁸DGS - Directorate-General for Health;

⁹ARS - Regional Health Administration;

¹⁰SICAD - Intervention Service for Addictive Behaviours and Dependencies.

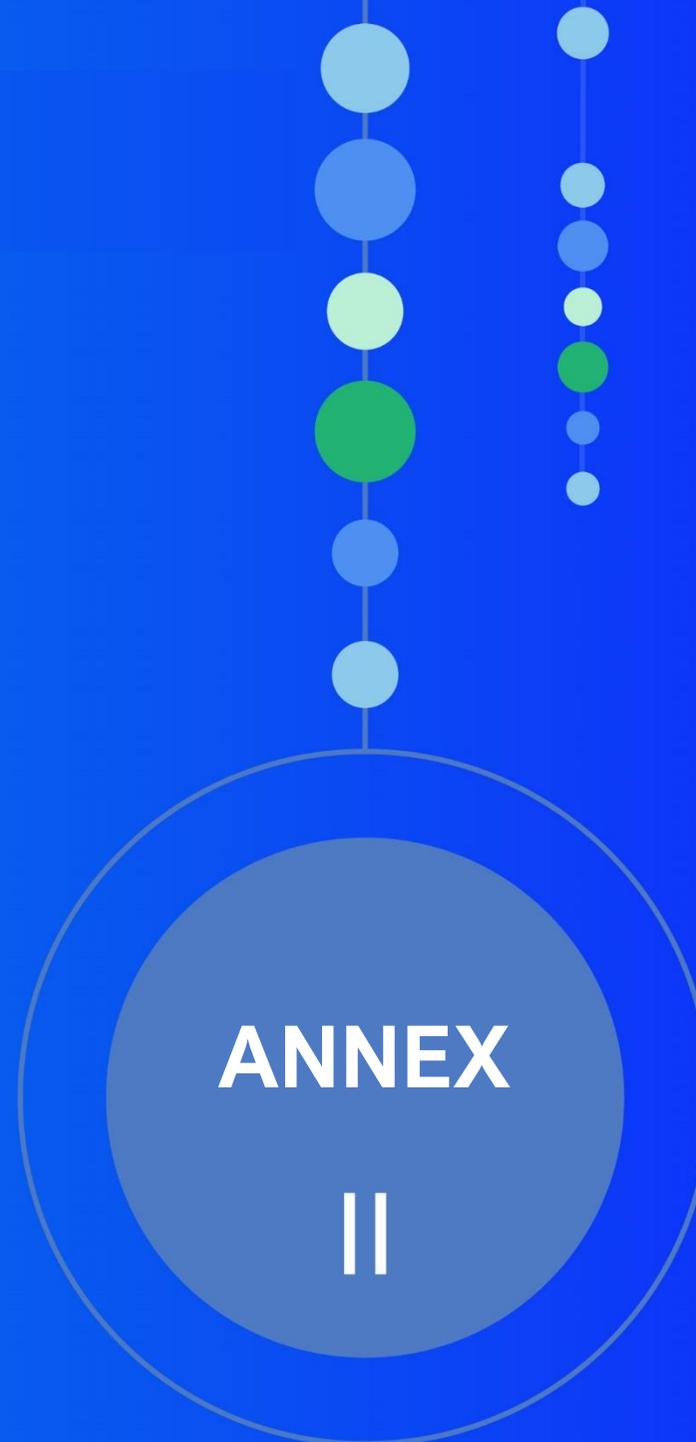
Monitoring and evaluation of the ENTI, in particular strategic initiatives, is ensured by EATA.

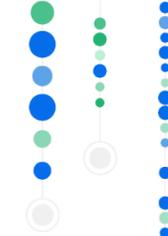


ANNEXES

ENTI ACTION PLAN

2023-2030



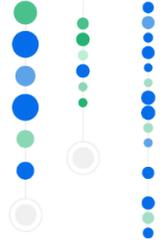


ANNEX II - ENTi Action Plan 2023-2030

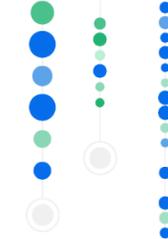
The Action Plan aims to map and schedule the set of key actions within each strategic initiative that guarantee the implementation of the National Smart Territories Strategy (ENTi). Each action is associated with a responsible entity, partner entities, an implementation deadline and funding sources.

Table 1 – Action Plan of the National Smart Territories Strategy

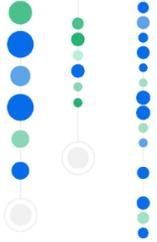
Objectives	#	Initiatives	Actions	Responsible entity	Partner entities	Timeframe	Source of Financing
Governance	1	Communicate and implement the multi-level governance model	Creation of guidelines aimed at entities involved in the governance of ENTi and a <i>toolkit</i> aimed at local entities that allows for simple appropriation of ENTi by the territories.	AMA ²	other services	2024	TSI ¹
			Implementation of the Governance Model through activation workshops and surveying of the needs of the <i>Smart City</i> networks currently existing at national level.		other services	2024	TSI
			Development, implementation and provision of a national Public Policies Dashboard.		other services	2026	RRP ³
			Creation of an operations room for the control and operation of the Public Policies Dashboard.		other services	2026	RRP
			Creation of tools to support the monitoring and follow-up of the ENTi, including national initiatives and projects at local level.		other services	2025	RRP
	2	Create the Smart Territories Portal - a central repository of information essential to the national ecosystem.	Assessment of content needs for the future Smart Territories Portal and definition of its vision, scope and content, including analysis of technical and functional requirements and specifications.	AMA	DGAL ⁴ , DGT ⁵ , CCDRs, I.P. ⁶ and ANMP ⁷	2024	TSI



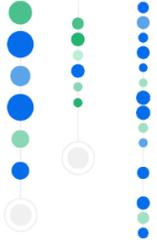
Objectives	#	Initiatives	Shares	Responsible entity	Partner entities	Timeframe	Source of Financing
Governance	2	Create the Smart Territories Portal - a central repository of information essential to the national ecosystem.	Development and implementation of the online platform, including design/prototyping, initial <i>setup</i> of the infrastructure, implementation, certification testing and training of key users, ensuring its management and operation.	AMA	DGAL ⁴ , DGT ⁵ , CCDRs, I.P. ⁶ and ANMP ⁷	2025	RRP
			Dissemination of the Smart Territories Portal, including its dissemination on relevant channels and its promotion within the community.			2025	RRP
			Creation of interoperability mechanisms between the Smart Territories Portal and the Building One-Stop Shop (eBUPI), which allow the sharing of information about the territory, with a view to ensuring better knowledge management and the generation of new business models associated with the territory	AMA	eBUPI ⁸	2025	RRP
	3	Training for territorial intelligence and sustainability	Assessment of training needs.	INCoDe.2030 ¹²	AMA, FEFAL ⁹ , INA ¹⁰ , IEFP ¹¹ , inter alia.	2024	TSI
			Development and implementation of training actions.			2025	RRP
			Dissemination and communication of training programmes.			2025	RRP
			Monitoring the impact of training.			2026	No financing needed
Policies, standards and regulations	4	Map and centralise information on legal and regulatory frameworks	Survey of the legal and regulatory framework related with <i>Smart Cities</i>	EMPD ¹⁴	AMA, ESPAP, IP ¹³ , IMPIC ⁹ , other public services	2025	TSI



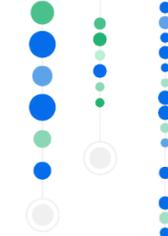
Objectives	#	Initiatives	Shares	Responsible entity	Partner entities	Timeframe	Source of Financing
Policies, standards and regulations	4	Map and centralise information on legal and regulatory frameworks	Centralisation and systematization of information at the portal	AMA	EMPD, other public services	2025	RRP
	5	Boost Technological Free Zones	Promotion and dissemination of national ZLT success stories at the portal	AMA	EMPD, ANI	2026	No financing needed
Financing	6	Ensure the allocation of the necessary investment and financing	Survey of financing needs in each ENTI domain.	EMPD	Other Services	2024	TSI
			Collection and systematisation of information on financing mechanisms for <i>Smart City</i> initiatives	EMPD	Management authorities for the PT 2030 regional programmes, other services	2024	TSI
			Integration of the Smart Territories Portal with the European Funds Portal to publicise support within the <i>Smart City domains</i>	AMA	AD&C ¹⁶	2025	RRP
			Provision of funds to municipalities, CIMs and other stakeholders for <i>Smart City projects</i>	Management Authorities of PT2030 ¹²	AMA, DGAL	2029	PT2030
			Identification of financing mechanisms for <i>Smart Cities</i> with private sector involvement	AMA	IAPMEI ¹⁷ and other public and private entities	2030	No financing needed
Partnerships	7	Enhance national, regional and local cooperation, as well as at a European and international level	Reactivation and revitalisation of the partner ecosystem, including the creation of the "Alliance for a Smart Portugal".	AMA	Other public and private entities	2025	TSI



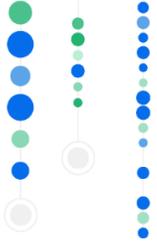
Objectives	#	Initiatives	Shares	Responsible entity	Partner entities	Timeframe	Source of Financing
Partnerships	7	Enhance national, regional and local cooperation, as well as at a European and international level	Collaboration in the creation of a catalogue of partners, focusing on local and regional public authorities and international networks, to be published at the Portal.	EMPD	AICEP ¹⁸ , other services	2024	TSI
			Enhance Portugal's representation at international level in terms of working groups/forums/networks and encourage the establishment of partnerships with key international entities.	AMA	AICEP, other services	2030	Funded by the responsible entity
			Promotion of the ENTi at national/international events and other events and communication actions.	AMA	AICEP, other public and private entities	2030	Funded by the responsible entity
	8	Facilitate partnerships with the public and private sector	Surveying and promotion of partnerships with Higher Education Institutions, R&D Centres, CoLABS and technology companies in <i>Smart City</i> projects, identifying success stories, needs, barriers and incentives.	EMPD	DGES ¹⁹ , ANI ²⁰ , FCT ²¹ and other public and private entities	2024	No financing needed
			Identifying stakeholders in the <i>Smart City</i> ecosystem and the creation of a network of leaders to be incorporated into the Smart Territories Portal.	EMPD	Other public and private entities	2025	RRP
			Creation of the "Alliance for a Smart Portugal"	AMA	Other public and private entities	2025	TSI
			Support for municipalities in attracting public and private partners with a view to facilitating partnerships.	AMA	DGAL, IAPMEI	2030	No financing needed



Objectives	#	Initiatives	Shares	Responsible entity	Partner entities	Timeframe	Source of Financing
Data and Platforms	9	Promote the implementation of urban management platforms (PGU)	Support for the implementation of PGU at local level	AMA	DGAL, ANMP	2026	RRP
			Development and implementation of a digital and interoperable platform, with national scope, in the field of urban planning (Electronic Platform for Town Planning Procedures)	AMA	IMPIC, DGT, DGAL, other services	2026	RRP
			Monitoring, reviewing and updating of Reference Architecture for Urban Management Platforms (ARPGU)	AMA	Other public and private entities	2026	Funded by the responsible entity
	10	Foster the development of digital twins	Support the development and implementation of digital twins of the territory in priority thematic areas nationwide	AMA	FCT, ANI, DGAE ²² and other services	2026	RRP
	11	Reuse and evolve existing solutions	Preparation of a study on solutions and <i>Building Blocks</i> (BBs) for the digital transformation of the PA, and the definition of new solutions/improvement actions	AMA	Other Services	2026	Funded by the responsible entity
			Incorporation of information dedicated to solutions and BBs at the Smart Territories Portal in a specific section	AMA	n.a.	2026	No financing needed
			Communication and dissemination of the aforementioned section at the Portal.	AMA	DGAL, ANMP	2026	Funded by the responsible entity
	12	Ensure communication and implementation of ARPGU governance principles	Implementation of ARPGU communication mechanisms as well as monitoring and supervision of stakeholder appropriation of ARPGU	AMA	EMPD, DGAL, ANMP, other services	2026	RRP



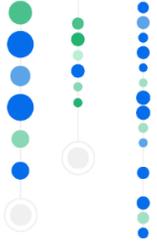
Objectives	#	Initiatives	Shares	Responsible entity	Partner entities	Timeframe	Source of Financing
Data and Platforms	13	Leverage the catalogue of Application Programming Interfaces (APIs)	Carrying out of <i>gap analysis</i> to identify and prioritise API development and provisioning needs	AMA	n.a.	2026	Funded by the responsible entity
			Implement a governance and monitoring mechanism for the APIs made available			2027	
			Disseminate advantages and good practices in the use of APIs at the Smart Territories Portal			2027	
	14	Promote the use and provision of data in an open system	Support the definition and communication of the national Data strategy and respective action plan, promoting the integration, valorisation and transformation of open data amongst stakeholders.	AMA	INCoDe.2030, EMPD, CNCS ²³	2024	PT2030
			Creation of incentives for the provision/reuse of open data by local and regional PA entities.	AMA	INCoDe.2030, EMPD, CNCS	2030	Funded by the responsible entity
			Promote the increase in literacy amongst local, regional and national decision-makers regarding open data and promote the use of the Open Data Portal.	AMA	INCoDe.2030, EMPD, CNCS	2029	PT2030
	15	Promote the use of communication and IoT infrastructure	Identify and support the implementation of 5G-based use cases	AMA	ANACOM, other partners	2026, 2029	RRP, PT2030
	16	Leverage cybersecurity maturity at local, regional and national levels	Cybersecurity Awareness and Training ¹ , and support to the creation of profiles for the implementation of specialised technical teams in the PA at national, regional and municipal levels	CNCS	AMA, DGAL, FEFAL	2030	Funded by the responsible entity



Objectives	#	Initiatives	Shares	Responsible entity	Partner entities	Timeframe	Source of Financing
Data and Platforms	16	Leverage cybersecurity maturity at local, regional and national levels	Promote the creation of local communities, in conjunction with the C-Network and the C-Network services portfolio with the objectives defined in the ENTI.	CNCS	AMA, DGAL	2026	Funded by the responsible entity
			Drawing up of guidelines on procedures <i>by default</i> and <i>by design</i> related with cybersecurity for the implementation of <i>Smart City projects</i>	CNCS	AMA, DGAL	2030	Funded by the responsible entity

Notes:

- ¹TSI – Technical Support Instrument *DG Reform* (European Commission).
- ²AMA - Agency for Administrative Modernisation.
- ³RRP – Recovery and Resilience Plan;
- ⁴DGAL - Directorate-General for Local Authorities;
- ⁵DGT - Directorate-General for Territory;
- ⁶CCDRs, I.P. - Comissões de Coordenação e Desenvolvimento Regional, I.P.;
- ⁷ANMP - National Association of Portuguese Municipalities;
- ⁸eBUPI - Mission Structure for the Expansion of the Simplified Cadastral Information System;
- ⁹FEFAL – Foundation for Studies and Training in Local Authorities;
- ¹⁰ INA- National Institute of Administration;
- ¹¹IEFP - Institute of Employment and Vocational Training;
- ¹²INCoDe.2030 - National Initiative for the Promotion of Digital Competencies e.2030;
- ¹³ESPAP - Entidade de Serviços Partilhados da Administração Pública, I. P.;
- ¹⁴EMPD – Portugal Digital Mission Structure;
- ¹⁵IMPIC – Institute of Public Markets, Real Estate and Construction;



¹⁶AD&C - Agency for Development and Cohesion;

¹⁷IAPMEI – Institute for Support to Small and Medium-sized Industrial Enterprises;

¹⁸AICEP - Agency for Investment and Foreign Trade of Portugal;

¹⁹DGES - Directorate-General for Higher Education;

²⁰ANI - National Agency for Innovation;

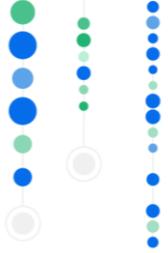
²¹FCT - Foundation for Science and Technology;

²²DGAE - Directorate-General for Economic Activities;

²³CNCS – National Cyber Security Centre.

**REFERENCE
ARCHITECTURE FOR
URBAN MANAGEMENT
PLATFORMS**





ANNEX III - Reference Architecture for Urban Management

Platforms

1. Framework

The Reference Architecture for Urban Management Platforms (ARPGU) forms an integral part of the National Smart Territories Strategy (ENTi), with a view to forming a common basis for providing the key elements to guide the scope of implementation of this type of platforms, ensuring a component of sharing and the structured construction of services, leading to the creation of collective intelligence at the level of national territories, in close alignment with European standards and the existing national standards.

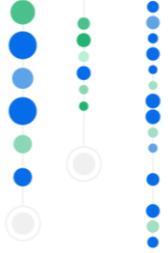
To design the ARPGU, multiple documents were considered which reflect the state of the art at an international level, such as the European Interoperability Framework for Smart Cities and Communities (EIF4SCC), the international project *SynchroniCity*, the European projects *Sharing Cities and ESPRESSO*, as well as a set of international regulations, standards, recommendations and best practices in the field of *Smart Cities*, developed by ISO, ITU, AENOR, ETSI, OASC, TMForum and FIWARE. At the national level, due consideration was given to the work carried out by the Public Administration regarding its *building blocks* (BBs), digital services and portals, as well as initiatives developed jointly with the Council for Information and Communication Technologies in Public Administration (CTIC) regarding the Common Model for the Design and Development of Digital Services (MOSAICO), and the Strategy for the Digital Transformation of Public Administration 2021-2026 and the respective Action Plan.

2. Importance

ARPGU plays a fundamental role in the ENTi, by promoting standardisation, interoperability, efficiency and collaboration in the development of platforms, resulting in smarter, more connected and sustainable territories.

3. Who is it aimed at?

ARPGU is aimed at a wide range of entities, with its target audience being political decision-makers at national, regional and local levels, as well as procurement departments in the preparation of tender specifications, systems' architects in the implementation of Platforms or even service providers. The



ARPGU guidelines are available at the Smart Territories Portal at territoriosinteligentes.gov.pt

4. Compliance

The PGUs of local, regional and national administration must verify compliance with the reference architecture that integrates the ENTi, to be precise, complying with the minimum requirements for the interoperability interface described in the ARPGU in chapter 6.2. All PGUs should use nationally defined data models, if there are any; if they do not exist, they should use internationally accepted models (e.g. FIWARE). This compliance ensures that all PGUs promote the interconnection and integration of the various digital systems and services of the territories, acting as an intermediary that allows different services and systems to exchange data with each other, leveraging their use and thereby enabling the creation of new services. This evolution aims to optimise the quantity and quality of services provided to citizens, thereby helping to improve their quality of life.



ENTI

ESTRATÉGIA NACIONAL
DE TERRITÓRIOS INTELIGENTES

2023 — 2030