Local Digital Twins for Smart Sustainable Communities

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Call for Pilots Manual: Work Strand 1 - Connecting Existing Local Digital Twins

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Abbreviations and acronyms

Abbr.	Description	Abbr.	Description
AI	Artificial Intelligence	GDPR	General Data Protection Regulation
ALTAI	AI HLEG's trustworthy AI assessment list	IDSA	International Data Spaces Association
CA	Consortium Agreement	IEC	International Electrotechnical Commission
Cerema	Centre d'études et d'expertise sur les risques, l'environnement, la mobilité et l'aménagement (Centre for Studies and Expertise on Risks, the Environment, Mobility and Urban Planning)	ISO	International Organization for Standardization
CfP	Call for Pilots	KPI	Key Performance Indicator
CFS	Certificate on Financial Statements	LDT	Local Digital Twin
DA	Data Act	LDT CitiVERSE EDIC	CitiVERSE European Digital Infrastructure Consortium
DEP	Digital Europe Programme	LDT4SSC	Local Digital Twins for Smart Sustainable Communities project
DGA	Data Governance Act	LIST	Luxembourg Institute of Science and Technology
DS4SSCC	Data Space for Smart and Sustainable Cities and Communities project (preparatory action)	MIMs Plus	Minimal Interoperability Mechanisms
DS4SSCC-DEP	Deployment project for the European data space for smart communities project (deployment action)	OASC	Open & Agile Smart Cities
DSSC	Data Spaces Support Centre	OCD	Ownership Control Declaration
EC	European Commission	OCT	Overseas Countries and Territories
ECA	European Court of Auditors	OLAF	European Anti-Fraud Office

Abbr.	Description	Abbr.	Description
EDIC	EU Digital Infrastructure Consortium	PDF	Portable Document Format
EEA	European Economic Area	PIC	Participant Identification Code
EIF	European Interoperability Framework	SIMPL	EU programme for Smart Middleware Platform, comprising of SIMPL Open, SIMPL Labs and SIMPL Live
ENoLL	European Network of Living Labs	SME	Small and medium-sized enterprise
EU	European Union	TalTech	Tallinn University of Technology
FAQ	Frequently Asked Questions	TEF	Testing and Experimentation Facility (CitCom.ai)
FRAIA	Fundamental Rights and Algorithm Impact Assessment	TGB	Technopolis Consulting Group Belgium
GA	Grant Agreement		

Glossary

Term	Description
Asset	Any digital artefact produced, adapted, or formally contributed by a pilot that can support the operation, reuse, sharing, transferability, or replication of a LDT.
Citizen-focused	Citizen-focused (or Citizen-centric) designs a process, service or project designed around citizens' needs and quality of life; that ensures citizen participation, transparency, and control; and enables co-creation and engagement of citizens in governance.
Cross-sectoral	Cross-sectoral can mean: ● The developed service integrates datasets from two or more sectors (e.g. mobility, energy…); or ● The LDT provides services that span across at least two sectors within a single use case.
Data Platform	Software for collecting, processing and rendering data in the form of a graphical interface or other control tools. Depending on needs, this software can be configured to send commands or the results of its analyses to other entities, connected objects and business software in particular. Based on this definition, many types of software can be data platforms, and an Information Technology (IT) infrastructure can potentially have several data platforms (software for visualising connected objects, data dashboards, digital twins, etc.).

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Term	Description
Data Space	Interoperable framework, based on common governance principles, standards, practices and enabling services, that enables trusted data transactions between participants. 🔗 DSSC - Key Concept Definitions 🔗 DSSC - Alphabetical List of All Defined Terms in Blueprint v2.0
Eligibility Check Grid	The checklist is used by the LDT4SSC consortium to check Call for Pilots applications against a set of defined eligibility criteria (legal, financial, technical, ethical).
End-User	Any individual, group or organisation that directly uses or benefits from the Local Digital Twin (LDT) services. It is the person who actually uses the service and not the developer or maintainer.
Ethical Board	The Ethical Board comprises a distinct group of experts that is established to assess ethical issues in the LDT4SSC Project. They will be asked to propose mitigation measures when ethical issues are identified.
Evaluation Committee	The Evaluation Committee covers a dedicated group of experts from LDT4SSC partners and external stakeholders who are responsible for evaluating the Call for Pilots applications. The intention is to have different Evaluation Committees nominated to evaluate the different applications submitted under each Work Strand and in each round of the Call for Pilots
Evaluation Team	The Evaluation Team is made up of selected people from the LDT4SSC project partners who have been assigned responsibility for organising the whole evaluation process and running the pre-screening of applications. Similarly, the Evaluation Team is tasked to provide both the final ranking and selection of the pilots.
Lead Partner	A Lead partner represents the legal entity that is responsible for the pilot implementation and carries out the coordination of the concerned pilot. It is preferred that the lead partner is a local or regional public administration in the EU Member States.
LDT4SSC Consortium	The LDT4SSC consortium includes a total of 9 partners: OASC, TalTech, ENoLL, Technopolis Consulting Group Belgium (TGB), Kereval (KEREVAL), The Luxembourg Institute of Science and Technology (LIST), Cerema, Libelium (LIBELIUM LAB) and UGent-IDLab (UGent).
Local Digital Twin	See the working definition here: https://knowledgehub.ldt4ssc.eu/resources_content/tech_resources/#what-is-a-local-digital-twin
Pilot Consortium	A Pilot Consortium refers to a collaboration of two or more participating organisations teaming up to jointly implement a project or an activity within a project.
Service	In this context is a means for a public administration to support public activities and/or help the decision-making processes.

Term	Description
	It should not be confused with the technical definition of a service[1].
Steering Committee	The committee responsible for making decisions regarding third-party funding, based on the evaluations conducted by the Evaluation Committee(s) and the Ethical Board. It consists of one representative from each private entity in the LDT4SSC consortium.
Stakeholder	A stakeholder is any individual, organisation or group that has an interest in, is affected by, is concerned by, or can influence a pilot's use-case or service. They are not necessarily pilot members. Some examples of stakeholder roles are: participating in shaping pilot projects, data providers, end-users of the service or the people impacted by it, experts, decision-makers, etc.
Use case	A use-case is a concrete, user-centred scenario in which an LDT (or federation of LDTs) delivers one or more services to tackle a real local challenge. It specifies the actors (who, for who), the data and systems involved (what), the expected service or outcome (why), and the technical and governance arrangements required to deliver, measure and sustain that service.
Third-party	A third party is, by definition, anyone not directly involved in the grant: neither the contracting authority nor the beneficiary (including coordinator, co-beneficiaries if any or affiliated entities if any)

[1] For instance, in the context of the LDT Toolbox, a service is defined as a deployable software building block that encapsulates a specific capability (e.g., interaction handling, messaging, data access, model control) and exposes it through standard interfaces (Application Programming Interfaces (API)s and/or event-based messaging). It may be delivered as software or Software as a Service (SaaS) and is used to compose LDT functions that support decision-making.

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Introduction

This manual serves as a comprehensive guide for the Call for Pilots (CfP) inviting applicants to submit pilot proposals under **Work Strand (WS) 1 – Connecting Existing Local Digital Twins**, for the Local Digital Twins for Smart and Sustainable Communities (LDT4SSC), funded by the European Union. The objective of the LDT4SSC project is to build a robust, scalable ecosystem of local digital twins and stimulate the market for innovative, Artificial Intelligence (AI)-driven Local Digital Twin (LDT) services. The project also seeks to address barriers to AI adoption in Europe, such as limited investment, regulatory complexity, and gaps in expertise. It supports the development of advanced AI-driven digital twin solutions by pooling public sector demand and ensuring a fair, competitive environment for innovators.

This document provides a comprehensive description of the overall CfP process, covering the scope of the call, its framework, the financial, ethical, and technical specifications, and the support to applicants. It further sets out the timeline, the evaluation, and the journey towards contract signing. This document also includes several Annexes covering all the information relevant to announcing the Call and supporting documentation for the CfP application. Parts of this document build on the CfP Manual of the European data space for smart communities project (DS4SSCC-DEP), adapted to the context of LDT4SSC.

This CfP is part of the open calls foreseen in the LDT4SSC project and covers three WS. WS1: Interconnecting existing LDTs to create a federated European Union (EU) wide network supporting seamless data exchange; WS2: Creating new LDTs based on common urban challenges like mobility, energy, air-quality and waste management to foster replicable solutions; and WS3: Advanced AI-based tools and innovative open-source components to enhance LDT capabilities with immersive and predictive services. This is the fourth CfP and it is targeted at pilot applicants interested in applying under WS1. The implementation of the pilots in each call is envisioned to last between 12 and 15months

The WS1 call is aimed at the following stakeholders: Public administrations at local, regional and national levels, serving the needs of local communities, together with their partners such as businesses, technology developers, research institutions and academia, and non-governmental organisations. The total EU funding available for the pilots in this call amounts to €1.2 million[2]. The following financial rules apply:

- The **maximum grant** awarded **per third-party across pilots** is **€500,000;**
- The **maximum** cumulative **grant per consortium** is **€1,000,000**;
- **Applicants** are required to **cover at least 50% of total pilot costs**.

The call for pilots manual is structured as follows:

- Chapter 1 introduces the LDT4SSC project and its open calls.
- Chapter 2 sets out the framework for the call: the aim of the calls, the scope and specific targets of Work Strand 1, consortium eligibility, the financial framework, the reporting, payment procedures, the non-technical and technical frameworks, the requirements and recommendations for pilots, and the ethical and data protection framework..

[2] The initial budget allocated to this call is EUR 1.2 million. This amount may increase slightly depending on the outcome of the grant agreement negotiations with the pilots selected under Call 3.

- Chapter 3 covers the process and timeline for the open call as well as instructions on how to apply.
- Chapter 4 covers the evaluation framework and selection criteria.
- Chapter 5 explains the support infrastructure available for applicants.
- Chapter 6 and 7 cover, respectively, training and support activities, and the impact assessment framework and expected outputs..
- Lastly, Annex 1 contains the templates that form part of the application package: the Financial Form, the Commitment Letter and the Ethics and Data Protection Self-Assessment.

- Annex 2 provides context information on: the LORDIMAS digital maturity assessment; the capabilities of a Local Digital Twin; European Green Deal policy areas, New European Bauhaus values and LDT4SSC key challenges; an example of a cross-sectoral use case; data governance; the NACE classification of economic activities; the high-level architecture of an LDT with the EU LDT Toolbox; the LDT4SSC methodology; and a list of potential pilot project assets.

1. About the Local Digital Twins for Smart and Sustainable Communities

The LDT4SSC project is funded by the Digital Europe Programme and has the following key objectives:

1. **Connecting existing LDTs from cities and communities** to create a federation of LDTs across the EU. Reinforced interoperability through the aggregation of LDTs at a larger scale (cross-sectors, cross-cities and cross-borders) will help in scaling up European common data sets and open-source solutions. It will also facilitate less advanced cities and communities joining the existing EU LDT ecosystem.
2. **Expanding existing local LDTs with new open-source LDT services based on shared needs of cities and communities**. These services should aim to improve decision-making processes and citizen interaction, reduce risks, costs, downtime and enhance resilience and sustainability of LDT platforms while enabling new value creation.
3. **Complementing the EU LDT Toolbox launched under the Digital Europe Work Programme 2021-22 with additional AI-based and innovative services** (e.g. for adaptable multi-sector considerations, advanced simulation and modelling approaches including bottom-up self-organised models). The AI services will be developed and tested within existing cities/communities and be replicable in other contexts.

These objectives form the foundation of an LDT ecosystem that empowers communities to collaborate effectively while advancing Europe's digital transformation.

This project seeks to build a robust, scalable network of Local Digital Twins (LDTs) and stimulate the use of innovative, data-driven and AI-driven LDT services. It builds on- and integrates- outputs from related EU-funded projects and initiatives, such as the deployment

project for the European data space for smart communities (DS4SSCC-DEP)[3], the EU LDT Toolbox[4], CitiVerse EDIC projects[5] Living-in.EU[6], CitCom.ai[7], and the Smart Middleware Platform (SIMPL)[8] leveraging existing knowledge, tools, and stakeholder networks. By doing so, this project contributes directly to the Digital Europe Programme's (DEP) objectives of enhancing technological sovereignty, promoting ethical AI, and fostering an inclusive digital market, while integrating ongoing initiatives including the Networked Local Digital Twins towards the CitiVERSE European Digital Infrastructure Consortium (LDT CitiVERSE EDIC), as well as supporting policy goals like the New European Bauhaus[9], the Green Deal[10], and the Digital Decade[11]. The figure below shows how LDT4SSC is positioned in the wider network of initiatives and the evolution from the Data Space for Smart and Sustainable Cities and Communities project (DS4SSCC) to LDT4SSC. Together, these efforts will establish a resilient LDT infrastructure that enables European communities to optimise urban services, share resources, and tackle shared challenges such as climate change, air quality, waste, and energy efficiency.

[3] The European data space for smart communities is an EU-wide action creating a cross-sectorial data space for governments on all levels and their providers to deliver the best possible services to their citizens by enabling interoperability to reach critical goals: https://www.ds4sscc.eu/

[4]The EU Local Digital Twin (LDT) Toolbox is a flagship initiative of the European Commission that provides a modular, standards-based suite of tools designed to help cities and communities across Europe simulate, analyse, and plan urban environments more effectively: https://interoperable-europe.ec.europa.eu/collection/ldttoolbox

[5] https://digital-strategy.ec.europa.eu/en/factpages/citiverse

[6]Living-in.EU is an EU initiative for local and regional leaders who believe that technology can help them make their town, city, or region a better place to live: https://living-in.eu/

[7]Testing AI in Smart Cities and Communities: https://citcomtef.eu/

[8]SIMPL is an open source, secure middleware that supports data access and interoperability in European data initiatives: https://simpl-programme.ec.europa.eu/

[9]New European Bauhaus (NEB) is a policy and funding initiative that makes green transition in built environments and beyond enjoyable, attractive and convenient for all: https://new-european-bauhaus.europa.eu/index_en

[10]The European Green Deal is a set of policy initiatives by the European Commission with the overarching aim of making the European Union (EU) climate neutral in 2050: https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en

[11] The Digital Decade policy programme, with concrete targets and objectives for 2030, guides Europe's digital transformation: https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age/europes-digital-decade-digital-targets-2030_en

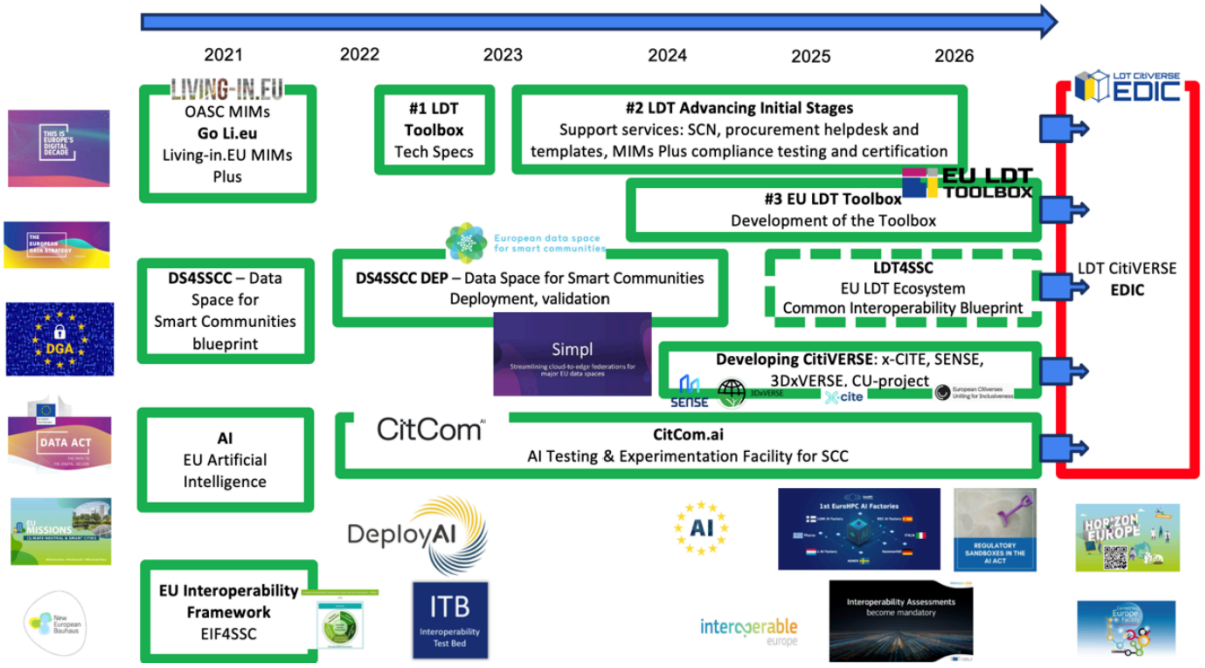

Figure 1. From DS4SSCC to LDT4SSC: LDT4SSC Smart Communities Ecosystem

The project also addresses broader barriers to AI adoption in Europe, which include limited investment, regulatory complexity, and gaps in expertise. By pooling public sector demand and ensuring a fair, competitive environment for innovators, it supports the development of advanced AI-driven digital twin solutions. This approach benefits both the public and private sectors, aligns with the European Union EU priorities for ethical AI and open standards, and reduces reliance on foreign technologies.

The LDT4SSC project is implemented by 9 partners, outlined in Table 1.

Table 1. LDT4SSC partners

OPEN & AGILE SMART CITIES & COMMUNITIES	LUXEMBOURG INSTITUTE OF SCIENCE AND TECHNOLOGY LIST	European Network of Living Labs
technopolis group	GHENT UNIVERSITY	Cerema CLIMAT & TERRITOIRES DE DEMAIN
KEREVAL	TAL TECH	libelium

In close alignment with the LDT CitiVERSE EDIC, the project accelerates the deployment of interoperable digital infrastructures across Member States, fostering a cross-border collaboration. In doing so, it contributes to the DEP's vision of a resilient, unified digital landscape.

2. Call for pilots framework

2.1. Aim of the call for pilots

The aim of the open calls for pilots is to engage European local and regional authorities and its various stakeholders, ranging from public administrations at local, regional and national levels, businesses, technology developers, suppliers, research institutions, and academia to participate in building a networked ecosystem of LDTs. The calls are designed to ensure transparency, equal treatment, and compliance with EU standards, including legal, financial, ethical, and technical requirements.

The Open Call focuses on **Work Strands 1 (WS)** which aims to interconnect existing LDTs to create a federated EU-wide network supporting seamless data exchange and interoperability. Ultimately, the call aims to select high-quality pilot projects that can contribute to creating an interconnected LDT ecosystem, promote collaboration among stakeholders, and accelerate the deployment and adoption of advanced digital twin services across Europe.

In the following table, there is a summary of the eligibility, scope and objectives of the WS1:

Work Strand	
Digital Maturity upon application	At least **two public authorities that already operate LDT**s in the pilot consortium
Use case	**Two cross-sectoral** use cases, each featuring one **shared service**.
Focus	Connecting and scaling LDTs that are already in place to share data and services.
Objectives	Demonstrate interoperability between existing LDTs. Enable cross-sector and cross-border data sharing.
Main expected Output	Federation of EU LDTs

Table 2. Summary of eligibility, scope and objectives of the Work Strand 1

2.2. Scope of Work Strand 1

WS1 is dedicated to **connecting and federating LDTs** across cities, communities and regions to create a **unified, interoperable and reusable EU LDT ecosystem**. In doing so, WS1 will support communities in accessing a comprehensive set of technical open

specifications and open-source software components to interconnect their LDTs through Data Spaces, with most solutions expected to align with the SIMPL framework where appropriate. These efforts are expected to draw on the European Data Space for Smart and Sustainable Cities and Communities (DS4SSCC) as well as relevant thematic data spaces such as those for tourism, mobility and other domains, with which data exchange is envisaged.

By leveraging standards, pilots will break down silos, scale up EU-wide datasets and onboard less-advanced communities into the LDT network. The goal is hence to **enhance decision-making** (particularly in key EU policies (like mobility, energy efficiency, or environmental)**, reduce redundancies and foster a collaborative data economy**, ultimately laying the foundation for a resilient, interconnected digital infrastructure that supports Europe's green and digital ambitions.

Through real-world use cases —such as cross-border traffic management or multi-city resource optimisation— it is expected that WS1 will transform fragmented local initiatives into a **cohesive, replicable,scalable and reusable federation of LDTs**, driving collective innovation and efficiency.

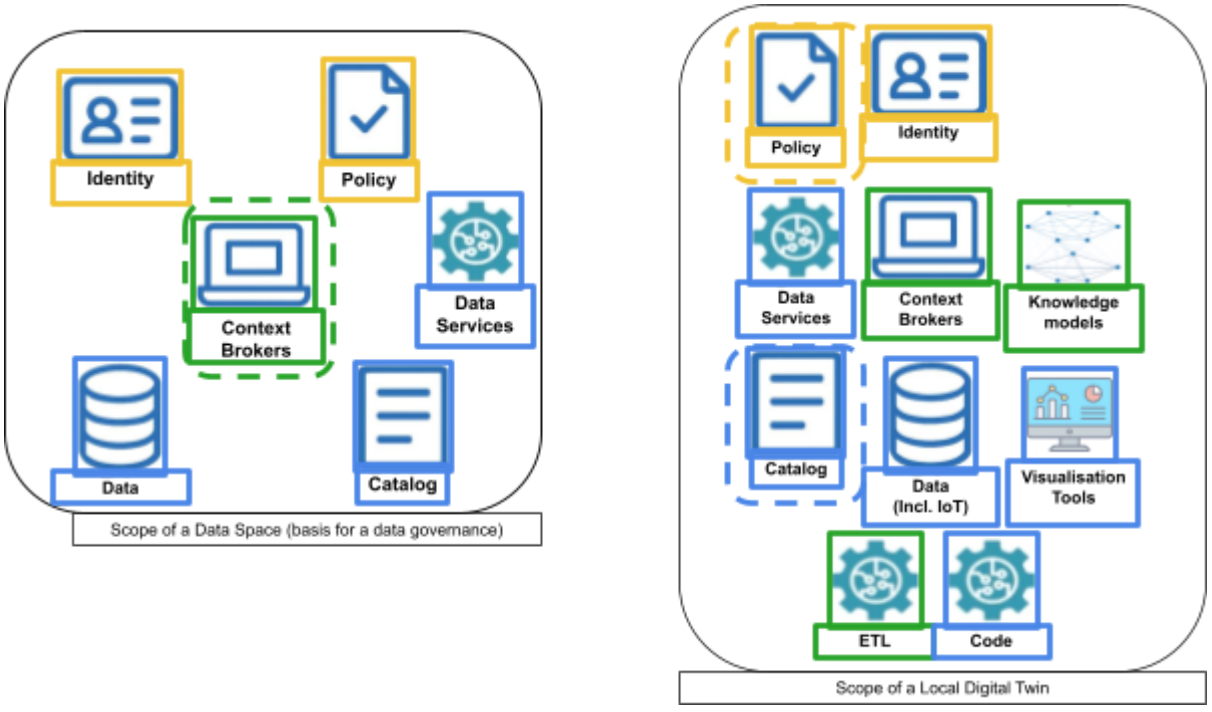

Figure 3. Functional scope of a Data Space vs. of a Digital Twin

Once a pilot project has clearly defined its non-technical dimensions, it should also specify its technical aspects. This step should be based on a solid understanding of both the LDT and the Data Space. An LDT enables functions such as data analysis and visualisation, while a Data Space facilitates data collaboration by managing data "transactions" going beyond simple cataloguing or contractual arrangements for data sharing (see Figure 3).

This document does not aim to completely and unambiguously define a "Local Digital Twin", as this field is continuously evolving. Many architectures and reference implementations already exist. For more information, a comprehensive overview of literature and evolutions in the field can be found by consulting the MIMs Plus 8 Working Group on Local Digital Twins' documentation. What follows is a practical example for the sake of this Call for Pilots:

Figure 3 describes common LDT components:

- The core of a Digital Twin is built around a **context broker,** specifying the function for contextual information on where the data was collected**, and a knowledge meta-model,** the latter linking the various domain-specific knowledge data models that the Digital Twin manages.
- **Other additional software components** offering:
  - Integration of data (Extract - Transform - Load, ETL),
  - Management of access rights to the digital twin's data and services (Identity, Authorisation),
  - Production of visualisations,
  - etc.

Digital Twins are further supplied with data from the context broker and complemented by a Business Intelligence (BI) layer, which enables the generation of tangible results for end-user data analysis. Same goes for the scope of the data space, the green-dotted line around the **Context Broker means that it is not a mandatory component of a data space.**

While **not essential to the core functioning of the Digital Twin,** the scope components **shown with dotted lines (**Policy and Catalog) play a key role in enabling interconnection with other Digital Twins:

- **Policy** describes the obligations and rights of both the data producer and the user. These are typically formulated using Open Digital Rights Language (ODRL). Such specifications are then interpreted by the authorisation component (such as Open Policy Agent).
- **Catalog**: A solution that enables the cataloguing of one's own data (by exposing its metadata) and the consumption of data from other catalogues to support interconnection, ideally using well-established standards such as DCAT.

Figure 3 (left) shows that interconnecting data spaces with LDTs involves all dimensions of contractual data management. Data spaces seeking to interconnect with LDTs must manage Identity (using Verifiable Credentials), implement specific Policies, and provide Data, Data Services, and Catalogs. The green dotted lines indicate that integrating a context broker is not mandatory, but it is recommended for effective interconnection with Digital Twins.

2.3. Specific targets for Work Strand 1

WS1 focuses on **federation and interoperability**, requiring pilots to prioritise **cross-border data exchange and the creation of shared data spaces** —demanding a baseline of digital maturity and collaboration among multiple public authorities. Ensuring that pilots meet this baseline helps reduce the risk of misaligned expectations, inefficient use of resources and solutions that fall short of addressing the specific challenges within each focus area.

WS1 Specific Targets
To connect LDTs from cities and communities that **already have an LDT in place;**
To create an EU federation of LDTs, which focuses on creating a strong foundation for interoperability across existing LDTs;

To foster a unified data ecosystem that enhances decision-making particularly for key EU policies and reduces redundancies;
To connect public authorities that are willing to share data, models and services with other data platforms (LDT, open data platforms, data lakes, data warehouse, etc.) and/or data spaces;
To support seamless data exchange and integration, both within individual communities and across regional networks;
To foster the development of skills among all pilot members including companies offering technical solutions for a better interconnection, a better maturity of components and documentations.

WS1 targets communities that already operate Local Digital Twins (LDTs), aiming to interconnect them and expand the LDT4SSC ecosystem established through previous calls. Pilots selected under WS2 and WS3 are likewise encouraged to integrate with this ecosystem while developing new LDT or AI-based services.

To qualify, pilot projects must demonstrate a strong commitment to sharing both data and services through LDT interconnection; for example, enabling one authority's twin service to be used by another. Achieving this requires effective data sharing, enrichment, and the adoption of common data governance practices. Through such collaboration, communities and local authorities can collectively enhance the efficiency, interoperability, and impact of their public services, as well as providing evidence of compliance with key EU policies on sustainability and environmental friendliness for cities.

Pilot projects may achieve this interconnection by deploying or joining an already existing data space. The results are to be open-source,replicable and shareable within the LDT CitiVERSE EDIC.

2.4. Consortia eligibility

The Open Call aims to address a diverse variety of local and regional communities. Accordingly, participation is open, but not limited, to:

- Public administrations at local and regional levels
- Public administrations at national level, European Digital Infrastructure Consortia (EDICs) such as the LDT CitiVERSE EDIC
- Businesses, technology developers, and suppliers
- Research institutions and academia
- Non-governmental organizations (NGOs), non-profit organisations and other civil society actors

Mandatory consortium structure

Each pilot consortium must comprise **at least two local and regional authorities** drawn from **two different eligible countries,** together with at least one additional partner drawn from one of the following categories:.

- Private entity (e.g., service provider)

- Private association (with legal status)
- Trusted third party
- Private representative of a use case sector

Private entities, research institutions, NGOs, and other partners may join the consortium in addition to this mandatory structure, but do not count towards the minimum two local or regional authority requirements.

Member(s) of the LDT4SSC Consortium **are not allowed** to be part of the pilot consortia.

Lead Partner requirements

While consortia may, in principle, be led by any eligible partner, preference is given to **EU local and regional authorities as Lead Partners**.

Where this is not the case, the LDT4SSC Consortium will assess on a case-by-case basis whether additional checks on financial capacity and ownership and control are required, taking into account the nature and mandate of the entity. These checks may delay the commencement of the pilot or affect pre-financing arrangements. Applicants in this situation are strongly encouraged to contact the helpdesk before submission to understand what documentation may be required

Country eligibility and restrictions

Eligible countries include:

- EU Member States, including their outermost regions, (together with their overseas countries and territories (OCTs))
- Non-EU countries (Norway, Iceland, Liechtenstein)
- Listed European Economic Area (EEA) countries and DEP Associated countries[12]. For the purposes of this call, eligibility is limited to DEP Associated Countries that joined the programme before 2025

Owing to security considerations, **restrictions apply to the composition of pilot consortia**:

- Entities must not be under the control of an ineligible country. Where there is a risk of such control, the entity will be required to provide a guarantee, which will be subject to assessment.
- All participants, with the exception of entities already validated as public bodies by EU Member States, must complete an **Ownership Control Declaration[13] (OCD)**. This must be self-declared at the proposal stage, and, in the case of a successful award, the official OCD must be submitted within 14 days of notification.
- Should an assessment reveal that a consortium member is controlled by an ineligible country, participation will be conditional on the submission and acceptance of an adequate guarantee. These guarantees will be examined on a case-by-case basis, taking account of the specific legal and factual circumstances.

12 https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/digital/guidance/list-3rd-country-participation_digital_en.pdf

13 https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/common/temp-form/af/ownership-control-declaration_en.docx

- Participation is restricted to entities established in eligible countries, whether acting as beneficiaries, affiliated entities, associated partners, subcontractors, or recipients of financial support to third parties.
- All project activities, including subcontracted work, must also take place within eligible countries.
- Participants from DEP-associated countries (with the exception of EEA members) are required to provide an appropriate guarantee, approved by their country of establishment, in order to comply with the provisions of this Call for Pilots Manual.
- The grant agreement (GA) will be signed exclusively with the Lead Partner, who will hold primary responsibility for project implementation. Consortium partners are, in turn, required to conclude a Consortium Agreement (CA) among themselves.

Applicants should further note that **no organisation (legal entity) may be awarded more than one grant as Lead Partner under this framework**. Where multiple applications from the same organisation are shortlisted in the respective Open Calls, only the highest-ranked proposal will be retained for funding.
The organisation's role as a Lead Partner will be checked in each final ranking process to determine whether it had already been awarded funding in previous calls. For this purpose, public administrations or universities will be treated as a single organisation represented by one legal entity, irrespective of the functional independence of their departments or units.
Final checks during the ranking phase will verify participation using, inter alia, the organisation's national registration number (e.g. VAT, national code, social security number, Participant Identification Code (PIC)), its legal name, and the name of its legal representative.
Organisations (legal entities) can be involved in multiple grants under this framework, however, organisations can at most be acting as Lead Partner in one pilot throughout the entire open calls.

2.5. Financial framework

2.5.1. Form of grant, maximum grant amount and reimbursement rate

Financial support will be provided in the form of grants, reimbursed on the basis of actual eligible costs incurred and reported through interim and final reporting. **Indirect costs** will be calculated as a **flat rate of 7% of eligible direct costs**, in line with the rules of the DEP.

The total EU funding available for the pilots amounts to €17 million (85% of the total budget of the LDT4SSC project). Under this call for pilots, the LDT4SSC project will allocate €1.2 million to Work Strand 1. The initial budget allocated to this Open Call is EUR 1.2 million. This amount may increase slightly depending on the outcome of the grant agreement negotiations with the pilots selected under Call 3.

The following financial rules apply:

- The **maximum grant** awarded **per third-party across pilots** is **€500,000 (across multiple consortia and awarded pilot projects).** Any expenses exceeding the maximum grant must be covered entirely by the pilot consortium members through their own resources**.** Organisations that have already received funding in a previous call take into account that amount when calculating their requested contribution.
- The **maximum** cumulative **grant per consortium** is **€1,000,000**
- **Applicants** are required to **cover at least 50% of total pilot costs**

Consortia applying to the CfP must provide a detailed budget, presented in **euros**. Applicants based in non-EU countries are required to apply the conversion rates published in the *C Series* of the Official Journal of the European Union[14]. Responsibility for any exchange rate risk lies entirely with the applicants; further provisions will be outlined in the GA.

The budget must be properly balanced, with total income (requested EU contribution plus own co-financing) matching total expenditure. Expenditure should refer exclusively to the estimated costs necessary for the implementation of the pilot.

2.5.2. Co-funding model

The co-funding model ensures that **EU support covers up to half of the eligible expenses**. **Applicants** demonstrate their capacity to **sustain at least 50%** of the pilot costs through their own resources as direct co-financing. This approach guarantees shared investment and responsibility between the EC and the participants, fostering stronger commitment and enhancing the sustainability of the pilot actions. Applicants are therefore expected to **clearly outline their funding strategy** when submitting proposals.

The co-financing must be a dedicated, auditable cost, explicitly indicated in the pilot budget and documented in accordance with normal accounting practices. Only direct monetary contributions or monetised resources included in the budget are eligible. In-kind contributions not monetised in the budget are not admissible.

All costs must be **actual**, **incurred during the pilot period**, and in full compliance with applicable regulations, including state aid rules and the prevention of double funding.

Costs declared under this call may not be funded simultaneously from another EU or national public funding source. Where a consortium member is involved in another EU-funded project (e.g. ERDF, Horizon Europe, CEF), costs allocated to that project may not be counted as co-financing or claimed as eligible costs under this call.

Participating local and regional administrations as well as any other member of the consortium contributing financially to the pilot activities are required to demonstrate their capacity to provide at least 50% of co-financing with a **Letter of Commitment[15]**.

2.6. Eligibility of costs

Eligible direct costs must be clearly attributable to the pilot and directly linked to its implementation. To qualify, costs must:

- Be incurred by the beneficiary during the pilot period, excluding costs related to final reports and audit certificates;
- Be included in the estimated overall budget attached to the GA[16];
- Be necessary for the execution of the pilot;
- Be identifiable and verifiable, recorded in the beneficiary's accounting system in accordance with national accounting standards and the beneficiary's usual cost-accounting practices;
- Comply with applicable tax and social legislation;

[14] ECB website https://www.ecb.europa.eu/stats/policy_and_exchange_rates/euro_reference_exchange_rates/html/index.en.html

[15] Letter of Commitment can be found on the Project Website at https://ldt4ssc.eu/call-one/

[16] Financial Form Template can be found on the Project Website at https://ldt4ssc.eu/call-one/.

- Be reasonable, justified, and adhere to principles of sound financial management, including economy and efficiency.

Additional considerations include:

- Value-added tax (VAT) is eligible where it is non-recoverable under national legislation and paid by a taxable person, in line with Article 13(1) of Council Directive 2006/112/EC;
- Costs must be necessary and proportionate, avoiding excessive or unnecessary expenditure;
- Accounting and auditing procedures must allow reconciliation between declared costs and supporting documentation;
- Documentation justifying costs must be retained for five years following the closure of the project.

According to DEP rules[17], eligible direct costs comprise **Personnel, Subcontracting, and Purchase Costs**, while indirect costs are eligible at a flat rate of 7% of total direct costs.

Cost category	
A. Personnel costs	
B. Subcontracting costs	
C. Purchase costs	C.1 Travel and Subsistence
	C.2 Equipment
	C.3 Other Goods, Works, and Services
D. Indirect costs (=7%*(A+B+C))	
Total eligible costs (A+B+C+D)	

Personnel costs

This category covers salaries and associated costs (social security, taxes, other statutory contributions) for personnel employed by the beneficiary, including seconded staff (e.g. a civil servant working on the pilot as part of their normal duties). Time spent on the pilot must be documented through a time-recording system (e.g., timesheets).

Subcontracting costs

Subcontracting is permitted only for specific action tasks defined in the pilot and must be included in the estimated budget. Subcontracts must follow competitive procedures to ensure best value for money and avoid conflicts of interest. Subcontracting may not cover pilot management, coordination, or tasks performed by consortium members.

[17] For comprehensive information on the eligibility of costs, please consult the Annotated Grant Agreement EU Grants and the DEP MGA, particularly Art.6.

Purchase costs

This category includes costs for goods, works, or services necessary for pilot implementation, subdivided as follows:

C.1 Travel and Subsistence – Eligible travel and subsistence costs for personnel or explicitly budgeted experts related to pilot activities.

C.2 Equipment – Depreciation or rental costs of equipment used exclusively for the pilot, calculated according to national or institutional accounting practices.

C.3 Other Goods, Works, and Services – Additional costs such as software licenses, dissemination, communication, and audit certificates.

Indirect costs

Indirect costs, which cannot be attributed directly to the pilot but are necessary for its administration, are limited to a flat rate of 7% of total direct costs (Personnel + Purchase + Subcontracting). This may include overheads such as utilities and office expenses. No supporting documentation is required for indirect costs.

Ineligible costs

Costs are not eligible if they:

- Represent capital returns, debt service, provisions for future losses, interest, doubtful debts, or currency exchange losses;
- Constitute excessive or reckless expenditure;
- Include deductible VAT;
- Are incurred after suspension of the pilot.

Additionally, the following are out of scope: infrastructure costs, sub-grants or prizes, and large research infrastructure.

Certificate of financial statement

In the event of an award, the Party responsible for the Funding Support (TGB), the EC, the European Anti-Fraud Office (OLAF), and the European Court of Auditors (ECA) reserve the right to conduct audits and checks on all aspects related to the grant, in accordance with Article 15 of the GA signed by the LDT4SSC project with the EC.

Awarded organisations requesting contributions of **≥ EUR 325,000** are required to submit a **Certificate on Financial Statements (CFS)** by an independent auditor with the final report. The CFS enables the granting authorities, TGB, OASC, EC, OLAF, and ECA, to verify that the costs declared in the financial statements are eligible. Please note that **this threshold is determined in accordance with EC regulations and may be subject to change should these regulations be revised.**

Costs incurred for producing the CFS are considered eligible and should be included under the **cost category C3, "Other goods, works and services**". Applicants are therefore advised to account for CFS-related expenses in their pilot budget estimates

2.7. Reporting

The Lead Partner of the Consortium is responsible for submitting both the interim and final reports on behalf of the consortium. The interim report should be prepared at the halfway point of the pilot's duration, while the final report should be submitted within 30 days of the pilot's conclusion.

The **interim reporting package** must include:

- A **Technical Report** outlining the activities carried out by consortium members, the use of resources, and updates on key performance indicators (KPIs), supported by evidence demonstrating tangible changes from the initial situation towards the expected impacts, as well as updates on risks.
- A **Financial Report providing a consolidated overview for the entire consortium**, including detailed information from all partners, documenting eligible costs such as actual direct costs and the 7% flat-rate for indirect costs.

The **final reporting package** must include:

- A **Technical Report** summarising the work carried out and the use of resources;
- A **Financial Report** containing individual financial statements from each member, similarly documenting eligible costs. All entities requesting contributions of **≥ EUR 325,000** must submit a **Certificate on Financial Statements (CFS)**. For further details regarding the CFS, please refer to **Section 2.5.6****.**

Pilot consortia are required to comply with contractual obligations under the Grant Agreement (GA), including provisions on Conflict of Interest (Article 12), Confidentiality and Security (Article 13), Ethics (Article 14), Visibility (Article 17.2), Rules for Implementation (Article 18), Information (Article 19), and Record-keeping (Article 20). Further details are provided in the Annotated Grant Agreement[18].

Pilot Deliverables

Applicants are expected to submit a workplan revolving around the LDT4SSC **pre-defined Pilot Deliverables** (PD)**.** No additional deliverables are required.

Nr.	PD Title	PD scope	Expected due date
PD1	Data Management Plan & Ethics	Defining data handling, storage, sharing and preservation practices, together with the ethical principles and compliance measures governing all data use.	M2
PD2	Interoperability Self-assessment	Complete the LDT4SSC Interoperability Self-Assessment tool. **A score above three at the end is a condition for payment.**	1. M2 2. At project halfway 3. At project end
PD3	Pilot Scope & Architecture	Defines the pilot by outlining its priority use cases, key stakeholders, and functional requirements, and sets out the high-level system architecture needed. This includes identifying technical requirements and specifications, data sources and models,	M3

[18] Annotated Grant Agreement. Link.

Nr.	PD Title	PD scope	Expected due date
		relevant standards, and the component framework necessary to develop an interoperable LDT aligned with the LDT4SSC blueprint. In the case of use of proprietary components, applicants are expected to provide a clear **development plan describing how the solution can be deployed using purely open-source technology**	
PD4	Governance Scheme	Operating and legal conditions for the solution and sharing of data and data models. Terms and conditions for sustainability, replication, scalability and sharing (legal clauses, contracts used, etc.).	M6
PD5	Communication, Dissemination, and Exploitation Report	Reports on the engagement strategy by detailing stakeholder engagement activities alongside communication, dissemination and marketing actions to support project visibility and involvement and promoting the services and their replicability. Provide a cost benefit analysis across social, environmental, organisational, and economic dimensions to substantiate your exploitation strategy. Report on the updated plan for sustaining the LDT beyond project lifetime, with the designed business model, referencing also the recommendations from the Strategy for Sustainability and Growth from the LDT4SSC project.	1. M3 2. At project halfway 3. At project end
SA	Self assessment questionnaire	KPI baseline report monitoring and indicators throughout the duration of the pilot	Baseline M2 Self assessment 1 at project halfway Self assessment 2 at project end

2.8. Payment procedures

Payment of the grant will be made in three instalments by Technopolis Consulting Group Belgium (TGB, the Party responsible for the Funding Support) to the Pilot Lead only, who will be solely responsible for distributing the grant among the consortium, as follows:

- **Pre-financing (30%):** Paid within 30 days of the GA signature to provide the consortium with initial resources to start project activities.
- **Interim payment:** Following the first reporting period, an interim payment may be made subject to a satisfactory interim evaluation. This payment will only be made **if**

the eligible costs reported at that stage exceed the amount of pre-financing already received.

The total disbursed at this stage **(pre-financing plus interim) will not exceed 85% of the total eligible costs.** Payment will be made within 30 days of a positive evaluation and after the Party responsible for the Funding Support has received the corresponding funds.

- **Final payment (remaining balance):** payment of the remaining eligible costs, paid after successful completion of the pilot and approval of the final report, bringing total disbursement to 100% of the grant. Payment will be made after the Party responsible for the Funding Support (TGB) has received the final payment from the Coordinator of the LDT4SSC project.

The financing remains the property of the Party responsible for the Funding Support (TGB) until the payment of the balance. In the case of any risk related to co-financing (50%) not being met during the grant awarding and/or any reporting stage(s), the consortium receives no pre-financing but gets reimbursed according to actual costs incurred at the end of the pilot, being certified by an external auditor.

2.9. Non-Technical Framework for Work Strand 1

This section describes the technical and non-technical frameworks that define the LDT4SSC vision for the pilot project. These frameworks provide the **foundation for the requirements and recommendations** presented later (see 'Description of requirements & recommendations'). While this section does not list specific requirements, pilots must ensure alignment with the frameworks outlined here. In essence, it t**ranslates the project's objectives and intended positioning into a guiding context** for all pilot activities.

The non-technical framework builds on existing and ongoing initiatives of the EU Smart communities ecosystem and is aligned and contributes to the European objectives regarding interoperability, digitalisation and the environment (Twin Transition, New European Bauhaus (NEB), Digital Decade, Green Deal, Data Strategy for a digital single market, Mission on Climate, Neutral and Smart Cities, Nature Restoration, Law, Soil Deal Mission, Restore our Ocean and Waters Mission). The overarching aim is to demonstrate **interoperable, replicable, scalable, and sustainable** digital solutions that can be replicated across Europe.

The approach to **interoperability in the LDT4SSC project follows a 'by-design' principle,** meaning that the ability of systems to exchange and use data with other systems is embedded from the outset rather than added later as an afterthought. In practical terms, this means that **technical, organisational, semantical and legal** choices are made from the outset to facilitate the smooth exchange of data and services with other systems or actors.

Solutions are expected to be designed for large-scale and cross-sector uptake, with clear pathways for scaling and integration into broader EU initiatives such as the LDT CitiVERSE EDIC[19] and the EU LDT Toolbox. This openness will enhance visibility, reduce duplication, and accelerate adoption. The LDT4SSC project invites cross-border and cross-sectoral pilot initiatives to help implement and validate an interoperable ecosystem of LDTs in Europe. To enable replicability and scalability of pilot projects, these pilots will contribute to and operationalisation of the technical and non-technical LDT4SSCC interoperability blueprint,

[19] https://digital-strategy.ec.europa.eu/en/policies/edic

which addresses: **technical interoperability guidelines, legal compliance and governance structures, viable business model strategies, value creation and economic sustainability, mechanisms for decision-making and coordination, transition strategies for future integration with the LDT CitiVERSE EDIC.**

Operationally speaking, this is made possible by pilots having methodological rigour. LDT4SSC, building on the DS4SSCC initiative, proposes a development methodology with four stages: **(1) Explore, (2) Validate, (3) Define and (4) Implement across three thematic dimensions: governance, value creation and technical implementation.** The LDT4SSC consortium supports pilots in the operational implementation of this method with a set of activities and workshops. This methodology covers various topics, namely:

- **Define data governance** across its four dimensions -political, technical, legal and organisational- to to facilitate the sustainability of the pilots project;
- **Have responsible digital practices** (ethics, eco-design of digital services, web-accessibility considerations, etc.) to create LDTs and services that are environmentally and socially responsible;
- **Perform a cost-benefit analysis** to get a comprehensive assessment of the digital solution indicating its financial as well as socio-environmental utility **relative to a baseline situation;**
- **Design a business model** to ensure the economic sustainability of the service after the pilot project;
- And **assess and measure impact** including economic impact as well as social and environmental impacts.

Following these steps and carrying out the proposed activities significantly increases the chances of success for the pilot project and sustainability.

Selected pilots will be part of a European-scale initiative aligned with the **EU Green Deal priorities**[20] and **New European Bauhaus**[21], targeting practical use cases addressing critical societal challenges through digitally-enabled innovation.

2.10. Technical framework for Work Strand 1

The technical framework for pilots in the LDT4SSC project builds on existing and ongoing initiatives of the EU Smart communities ecosystem, also described in the project Knowledge Hub[22]. This underlines the LDT4SSC ambition to consolidate the existing architectures and best-practices into a clear and actionable Interoperability Blueprint[23]. This blueprint will be updated to reflect the learnings of the pilots and can serve as a tool to facilitate and speed up the go-to-market for future digital twin developments.

From this prior work, the LDT4SSC project recognises that an overarching meta-architecture is emerging for European LDTs and that it will allow a fair level-playing field for technology providers and procurers alike. This meta-architecture, as shown in Figure 4, has

[20] For more information on the European Green Deal see https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en
[21] To learn more about the New European Bauhaus initiative see https://new-european-bauhaus.europa.eu/index_en
[22] See https://knowledgehub.ldt4ssc.eu/
[23] The LDT4SSC Interoperability Blueprint will draw on sectoral data space blueprints and insights from the Local Digital Twin Toolbox, as well as insights from the piloting activities. This blueprint will foster the creation of interoperable Local Digital Twins across different sectors and regions, considering both technical and non-technical layers.

interoperability at its core and will stimulate a strong and dynamic innovative market fueled by the public sector:

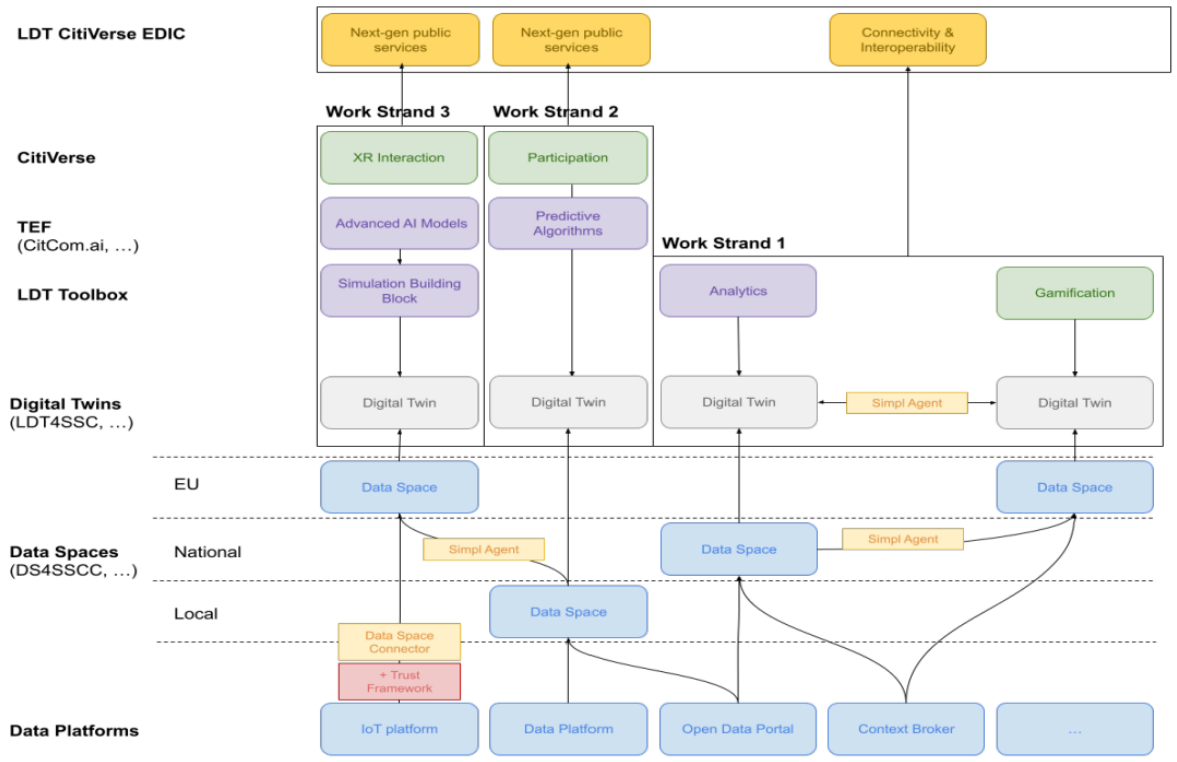

Figure 4. Meta-architecture for LDTs and Value-added services

1. **Data systems and Platforms that are set up within local ecosystems** are augmented with Trust Frameworks, Publication and Discovery Services, as well as Access and Usage Policies to make up a DS (DSSC Data Space Blueprint v2[24], DS4SSCC-DEP Blueprint[25]).

2. **Data Spaces (DSs) become interconnected**, through, among other mechanisms, Data Connectors (see the IDSA Data Connector report[26]).

3. These local or regional DSs are expected to be **federated in European Data Spaces**, through, for example, the SIMPL framework[27], funded through DIGITAL Europe.

4. On top of these Data Spaces, **LDTs are developed using tools from the EU LDT Toolbox** and other components available through various suppliers.

5. Within the Testing and Experimentation Facilities (TEFs), **advanced AI and machine learning tools and models are made available** to further increase the effectiveness of the services developed within the LDTs.

[24] See: https://dssc.eu/space/BVE2/1071251457/Data+Spaces+Blueprint+v2.0+-+Home
[25] See: https://www.ds4sscc.eu/inventory
[26] A comprehensive overview of available data connectors based on the IDS Reference Architecture Model: https://internationaldataspaces.org/data-connector-report/
[27] See footnote 5: https://digital-strategy.ec.europa.eu/en/policies/simpl

6. **Interoperability is built into these value-added services**, thanks to the MIMs Plus[28] and the EIF[29]. This way, these services can **benefit other communities**. They are therefore fed back into the EU LDT Toolbox or the DOME and disseminated.

7. These **value-added services and the underlying connectivity, infrastructure and interoperability are planned to be sustained by the European Digital Infrastructure Consortium (EDIC)** –in this case, specifically, the LDT CitiVERSE EDIC (See 2.6 Non-Technical framework for further information on how operations are sustained).

2.11. Description of requirements & recommendations

2.11.1. Considerations

All listed requirements must be explicitly demonstrated in the application. Applicants are expected to demonstrate compliance primarily through the application form[30], which translates these requirements into clear questions, dedicated submission fields, and supporting guidance. The form is structured into four sections (*Pilot Details*, *Relevance*, *Implementation*, and *Impact*) each containing specific questions to guide applicants in describing their project. This will ensure that evaluators can verify compliance and compare proposals consistently. Note that these requirements do not cover administrative, financial, or ethical aspects, as those are addressed below in the CfP. Requirement and recommendation numbers are harmonised across the three Work Strands, so that the same number refers to the same topic in each WS manual. Numbers that do not apply to WS1 are omitted, which explains the gaps in the numbering.

Requirements (Rq) are formulated across the following dimensions: *Pilot Details, Relevance, Implementation, and Impact.* Requirements are mandatory. Some are part of the pass/fail eligibility check and others are assessed by evaluators. Applicants must provide a convincing workplan (via the Application Form) describing how they intend to achieve the desired results.

Recommendations (Rc) are formulated across the same dimensions. They are optional but useful to improve the pilot's application, implementation, and potential to be sustainable.

The LDT4SSC initiative invites applicants to submit their project proposal using the official Application Form[31]. The form is structured into four sections (*Pilot Details*, *Relevance*, *Implementation*, and *Impact*) each containing specific questions to guide applicants in describing their project.

[28] The minimal interoperability mechanisms (MIMs) Plus enable a minimal but sufficient l and f interoperability for data, systems, and services specifically in the context of smart city solutions: https://living-in.eu/group/7/commitments/mims-plus-version-8-2025

[29] See footnote 15: https://interoperable-europe.ec.europa.eu/collection/iopeu-monitoring/european-interoperability-framework-detail

[30] See Application Form at https://ldt4ssc.eu

[31] See Application Form at https://ldt4ssc.eu/call-one/

To support the completion of the form, applicants are encouraged to consult the Requirements (Rq) and Recommendations (Rc) provided for each of these four dimensions. While the form itself offers space and instructions for outlining the pilot project, the accompanying guidance clarifies what is expected in each section and helps applicants prepare a complete and well-aligned submission.

2.11.2. Pilot Details

Rq1	At least two **public authorities in the pilot consortium must be operating a digitally mature LDT**. In this context, "Digitally mature" means having an existing LDT[32] (can also be supported by a data space) with at least descriptive-level capabilities (see explanation in Annex 2.2) and dynamic data integration. This platform must already provide services within the city or community. Applicants can refer to the LDT definition used in the context of the LDT4SSC project to assess if they have the expected digital maturity to join. This maturity must be demonstrated (see Rq2).

[32] See https://knowledgehub.ldt4ssc.eu/resources_content/tech_resources/#what-is-a-local-digital-twin for a definition.

Rq2	For **each pilot member already operating an LDT to be interconnected** (GIS, open data, data warehouse, data dashboards, etc.), **provide**: 1. **A high-level description of the existing** platform and its main capabilities. Including (based on the LDT definition[33]): **a.** What is the defined local context of the LDT, and what physical assets, systems, or processes does it digitally represent in this local context? **b.** What dynamic and static data does it leverage? **c.** What visualisation, analysis, simulation, and reasoning services that support decision-making does it enable? Demonstrate that the LDT currently has descriptive capabilities by describing past and current values of some of the physical asset characteristics it presents. 2. Where available, include a public reference (e.g., URL) to the platform; if not publicly accessible, provide representative screenshots of the platform's front-end. 3. A **high-level description of the current architecture** covering both: 1. **technical aspects:** Specify the main tools, standards, and software components (for data acquisition, connectivity, trust, data management, analysis, visualisations and decision-making) used. Provide a deployment diagram. 2. **functional aspects:** Illustrate the lifecycle of the data used in the LDT (from collection to use and sharing). Provide an activity diagram. **This description must only display existing components and functionalities. Don't describe any ones currently being developed or ones planned.**
Rq3	**Pilots must include at least two cross-sectoral (See Annex 2.4 for an example and Annex 2.6 for NACE codes for sectors) use cases, each featuring one shared service.** (see Glossary for definitions; See the KH, for example pilot stories[34]). Describe each use case in a structured and policy-relevant manner, including: ● the services to be delivered; ● the city challenge or policy question addressed; ● the data and tools involved; ● the decision-making support functionality (i.e. what decisions will be taken differently, by whom, when); and

[33] See https://knowledgehub.ldt4ssc.eu/resources_content/tech_resources/#what-is-a-local-digital-twin for a definition.

[34] LDT4SSC. "LDT4SSC Non-Technical Resources." LDT4SSC Knowledge Hub, 2025, knowledgehub.ldt4ssc.eu/resources_content/non_tech_resources/#example-stories.

	• the link to the local authority's daily activities and its remits (e.g., water management only if the entity manages water).
Rq4	Describe the current data governance (see explanation under Annex 2.5) scheme of each pilot site and the **target data governance** scheme of the pilot consortium across the political, technical, legal, and organisational dimensions.
Rc1	For each local authority/government involved in the pilot, **please give the score obtained at the LORDIMAS digital maturity assessment[35] (see explanation in Annex 2.1)**. The **pilot lead** is **recommended to be at the 'Digitally Optimised'** stage assessment, while all other participating authorities are recommended to be at least **at the 'Moderate' stage** in the LORDIMAS self-assessment upon application. All public authorities participating as **pilot members are recommended to reach the 'Digitally Optimised'** stage in the assessment, or to demonstrate further progress if they have already attained this level by the end of the project.
Rc2	To better demonstrate the replicability of the developed service, **it is recommended that more than two public authorities join the pilot consortiums.**

2.11.3. Relevance

Rq6	The use cases should align with the **European Green Deal Objectives[36]** or the **New European Bauhaus[37] priorities, or tackling key challenges identified by LDT4SSC** (see explanation in Annex 2.3). **Describe how the pilot addresses European priorities as well as the objectives of the LDT4SSC initiative and its ecosystem (for example, by advancing shared knowledge, tools, or methodologies).**

[35] MaturityAssessment-help | LORDIMAS_EN
[36] See https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en
[37] See https://new-european-bauhaus.europa.eu/index_en

Rq7	**Each participating public authority must ensure both technical capacity** (e.g., designated technical staff for implementation and continuity) **and political support**. **Describe project management and coordination, including resource allocation**. Provide an overview of the project teams, their collaboration approach, and any planned recruitment. If additional skills or resources are needed, explain how they will be secured through consortium partners, subcontractors, or other means, and specify the roles or profiles involved. **Describe the political endorsement** (see *Letter of Commitment*) of your pilot, specifying the type and extent of support. Where available, reference published or online materials (with links) or attach supporting documents that substantiate this endorsement.
Rq8	**Pilots must actively engage end-users.** Specify **the end-users of the planned shared services and describe how they will be engaged throughout the project lifecycle** through workshops, consultations, or other participatory activities.
Rq9	**Each pilot must involve at least three of the four Quadruple Helix stakeholder groups** (public sector, private sector, academia/research, and civil society) in these engagement processes. List the involved and expected **stakeholders across the four Quadruple Helix categories,** outlining their roles, responsibilities, and engagement approach.
Rq10	Explain the **broader applicability and relevance of your pilot. Indicate** how its approach and/or results are relevant to be transferred to other EU communities.
Rq11	**Describe how the project will align with and leverage the following relevant EU initiatives in their projects:** guidelines and specifications (e.g. DSSC, Gaia-X…) and/or deployment of tech stacks from other EU initiatives (SIMPL, EU LDT Toolbox, …).

2.11.4. Implementation

Rq12	The project description and work plan should adopt the LDT4SSC methodology, following the phases: Explore, Validate, Define and Implement. (See Annex 2.8). Applicants are expected to submit a workplan revolving around the LDT4SSC pre-defined Pilot Deliverables (PD) (See Pilot Deliverables).
Rq13	**Pilots must interconnect public authorities' LDTs.**

Rq14	**Describe how the pilot consortium will technically interconnect their LDTs**, specifying the tools, software, and standards selected for each component (for data acquisition, connectivity, trust, data management, analysis, visualisations and decision-making, etc.), enabling operability. Highlight what is reused in the already existing infrastructures. **Demonstrate integration with the SIMPL Data Space Governance Authority Agent[38] that is required to be used**. Specify how the LDTs are deployed (e.g. hosted solution, Software-as-a-Service (SaaS), on-premise) and explain how each participating public authority operates the shared services that will be jointly developed. Applicants must **complement the description with two draft diagrams**: one of the intended technical (deployment diagram), and one of the intended functional architectures illustrating the pilots' data lifecycle (activity diagram).
Rq16	Describe **what data, assets, and services will be shared across pilot members through the interconnection of the LDTs,** the sectors involved (see Annex 2.6 for NACE sectors), and the main providers and beneficiaries.
Rq17	Pilots must e**nsure semantic interoperability of all data exchanged** (MIM1)[39] **within the pilot ecosystem by relying on open and widely recognised standards** (e.g., NGSI-LD, LDES, etc.). Applicants must **describe the standards** used, how **common data descriptions** are defined or aligned across pilot members, **and how semantic interoperability is** ensured for data exchange, federation and reuse (See MIM1).
Rq18	Pilots must **achieve a score of at least 3 on the LDT4SSC Interoperability self-assessment tool[40] by the end of piloting activities.**
Rq19	Indicate which **MIMs Plus (MIM0–MIM8)[41]** the project will engage with (e.g., *contribute to*, *implement*, or *comply with*) and provide a brief justification for this choice —such as existing capabilities, planned developments, or limitations. For each selected MIM Plus, estimate the current and planned level of compliance (e.g., *Initial*, *Partial*, or *Full*)[42]. **The pilot must engage with at least the five foundational MIMs Plus[43]**.
Rq20	Describe whether adva**nced Digital Technologies, such as AI / XR / edge computing,** are used in the services, how, and for what purpose, and how

[38] https://code.europa.eu/simpl/simpl-open/development/agents/governance-authority
[39] https://mims.oascities.org/NzWXOO1Fttw4wtqv1Wys/mim1-interlinking-data
[40] Available soon at https://ldt4ssc.eu/
[41] https://living-in.eu/group/7/commitments/mims-plus-version-8-2025
[42] **Initial (1)** – The solution only partially addresses this MIM Plus, with limited features or early-stage implementation. **Partial (2)** – The solution implements key aspects of this MIM Plus but still lacks some elements for full compliance. **Full (3)** – The solution fully complies with this MIM Plus, meeting all major requirements.
[43] Which are: MIM0 (Accessing Data), MIM2 (Processing Data), MIM1 (Interlinking Data), MIM6 (Securing Data) and MIM3 (Sharing Data).

	ethical and legal considerations are managed. Where AI is used in public services, pilots must comply with the AI Act, taking into account any relevant amendments introduced by the Digital Omnibus.
Rc3	Pilots are **encouraged to pursue alignment with the forthcoming EU LDT Toolbox** as its specifications become available.
Rc4	Pilots are **encouraged to federate and interconnect with LDT4SSC pilots from previous calls, including WS1 pilots as well as pilots of WS2 and WS3, using the SIMPL** Data Space Governance Authority Agent[44].
Rc5	Pilots are encouraged to use **open-source technical components** to promote transparency, reduce costs, and foster community collaboration. Any enhancements or customisations developed during the pilot should likewise be shared back with the open-source community to support collective progress and reusable innovation.
Rc6	Pilots are encouraged to **include in their consortium agreement provisions for the non-exclusive transfer of Intellectual Property or exploitation rights, as well as clear rules for protecting and sharing know-how** among consortium members and beyond.
Rc7	Pilots are strongly encouraged to establish, as appropriate to their project scope: • A **data catalogue using the W3C Data Catalog Vocabulary** (DCAT) for semantic interoperability. • A **data management system (e.g., context broker) capable of handling contextualised metadata descriptions (ontologies)** such as JSON-LD, RDF, or NGSI-LD for semantic and technical interoperability. • An **identity and access management system based on OAuth2, OpenID Connect, or W3C Verifiable Credentials** for legal and organisational interoperability. • An **ODRL-based data policy** to support legal interoperability.

[44] https://code.europa.eu/simpl/simpl-open/development/agents/governance-authority

2.11.5. Impact

Rq22	Explain **how the interconnected LDTs and shared services will contribute to governance, efficiency and innovation within and across the pilot members**. Applicants should pay special attention to what capabilities, services, insights or decision-making processes become possible and add value, compared to what could be achieved without them. Describe how the LDT will be embedded in the local authorities' decision-making processes.
Rq23	Describe the anticipated **wider socio-economic and environmental effects** of your pilot beyond their direct scope, explaining how the eco-design approach contributes to these broader impacts and long-term sustainability. Describe the **tangible benefits and long-term impacts expected** for the participating communities, outlining the **immediate value proposition, sustainability potential, and measurable indicators** to track progress.
Rq24	**Pilot's workplan must foresee setting up a contractual framework that guarantees the sustainability of the LDTs and services** (legal clauses that guarantee, for instance, the right to use the data or services, to manage Intellectual Property or the analyses carried out, the post-pilot exploitation rights, etc.)
Rq25	Outline the **pilot's strategy for maintaining the LDTs and pilot activities beyond the project's duration**, explaining how results will be sustained and scaled up after the pilot phase. Describe how the consortium will elaborate risks & mitigation mechanisms for sustaining the LDT service: ● from political, social, technical, operational, business, and legal perspectives, ● during the pilot and, e.g., at least 1 year beyond the project. **Indicate pilot's initial plans for financial sustainability beyond the project lifetime** (e.g. by sourcing new funded projects, fundraising, getting a long-term commitment from the city, etc).
Rq26	Pilots must describe the **main expected assets and services** produced in **the pilot projects (**See Annex 2.9 for a List of potential pilot project assets for reference), and indicate which of them they intend to contribute to the LDT4SSC Assets and Services Repository.

Rq27	Assets and services developed during the pilot must be shared through the LDT4SSC Assets and Services Repository, with comprehensive documentation, practical use cases and implementation guidelines, enabling other cities and communities to understand, adopt and reuse them.
Rq28	**Created or adapted data models must be published in open repositories under open licences, and developed services should be made available through the EU LDT Toolbox Marketplace for reuse by others, once available**
Rq29	The in**clusion of proprietary components must be justified** and accompanied by a plan demonstrating how an equivalent solution can be achieved with open-source technologies.
Rq30	The interconnection must be **fully replicable** in other cities and communities across the EU. Describe the **measures taken to guarantee Replicability and Scalability** of the LDT federation. Demonstrate how the interconnection can be reused and **scaled** to address other use cases and share other data, assets and services.
Rq31	Pilots are expected to **maintain up-to-date documentation of their projects and provide it to the LDT4SSC consortium** (at least through Reports and Pilot Deliverables). Pilots are also **expected to maintain regular documentation and updates for the Knowledge Hub**.
Rc8	The use of MIT or Apache open licence is recommended
Rc9	Pilots are advised to record **all relevant baseline data**, including socio-economic, environmental, and organisational aspects, before starting the project to **enable meaningful comparisons in the final Cost-Benefit Analysis**.
Rc10	Pilots are advised to assess their level of maturity in eco-design thanks to the General policy framework for the ecodesign of digital services version 2024[45] at least for the 30 highest-priority criteria at the start of the pilot implementation and then towards the end.

2.12. Ethical and data protection framework

The development and use of LDTs within local and regional authorities are grounded in the principles of transparency and trustworthiness. Consequently, it is essential that their implementation adheres to strong ethical standards.

[45] See https://www.arcep.fr/uploads/tx_gspublication/general_policy_framework_for_the_ecodesign_of_digital_services_version_2024.pdf for more

The ethical practices required from the pilot consortia draw on recognised frameworks and guidelines, including ALTAI (AI HLEG's trustworthy AI assessment list), Fundamental Rights and Algorithm Impact Assessment (FRAIA) and International Organization for Standardization (ISO)/International Electrotechnical Commission (IEC) standards on ethical and societal concerns.[46]

In addition, the LDT4SSC project has established an Ethical Board that participates in the evaluation of CfP proposals and oversees pilot implementations. Ethical aspects are also integrated into the Pilot Support activities through targeted training and mentorship.

WS1 follows the 'Ethics and Data Protection By Design' approach for the CfP process. It sets several checkpoints with the pilot consortia to raise awareness on ethical and legal challenges and to assess each consortium's capacity to address them effectively. The checkpoints include:

- **Before the submission of application:** In connection to open calls, interested applicants will receive guidance on ethics and data protection during organised sessions. This information will help applicants in identifying ethical and legal challenges and mitigating these upfront. The applicants will also need to complete the **Ethics and Data Protection Self-Assessment** and submit this together with the main application document.
- **During the evaluation of applications**: The Ethical Board will compare ethical self-assessment with proposed work package structures presented in the application (see also Evaluation Process overview).
- **At the start of pilot projects**: Following the announcement of the selected pilots, representatives from the Ethical Board will contact the pilot consortium to discuss ethical needs and provide feedback to mitigate any concerns. For example, they may ask to allocate more time or resources to an ethical aspect that requires attention. This type of feedback should then be accounted for prior to the pilot's start.

The LDT4SSC consortium is responsible for providing overall guidance and monitoring of the project, the CfP procedure and the evaluation. While identifying potential issues falls within the remit of the Ethical Board, the responsibility for the actual work carried out in the pilots, including identifying and mitigating ethical and legal challenges, is beyond the direct control and responsibility of the project consortium.

While it is useful to define common principles, these alone cannot guarantee trustworthy or ethical practices[47]. It is therefore recommended (and in some cases required)[48] that LDT implementations set up mechanisms for oversight, as well as collaborate with a broader LDT community of experts to resolve any ethical issues upfront. Afterall, fair, compliant, and trustworthy access to- control over- and (re)use of- data can only be reached by interdisciplinary efforts and involvement of a broad community of experts and stakeholders.

[46] Note that pilot consortia must ensure that their contractual obligations under Article 12 (conflict of interest), and Article 14 (ethics) among others are followed. See: Annotated Grant Agreement https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/common/guidance/aga_en.pdf
[47] See e.g., Mittelstadt 2019, https://doi.org/10.1038/s42256-019-0114-4 >.
[48] Note that according to the EU's AI Act, data used to build the services and solutions on the platform should be traceable to its origin and should be capable of providing full transparency, if requested.

2.12.1. Compliance with relevant legislation

While ethics go beyond compliance with existing regulation, it is worthwhile to point out that the pilots need to take all required steps to guarantee compliance with the provisions of the relevant EU regulations, inter alia:

- General Data Protection Regulation (GDPR)[49]
- ePrivacy Directive[50]
- Data Governance Act (DGA)[51]
- Data Act (DA)[52]
- The Interoperable Europe Act[53], and
- AI Act[54].

Applicants shall comply with applicable data protection legislation including but not limited to the GDPR and any national implementing laws, regulations, and secondary legislation, in each case as amended, supplemented or replaced from time to time. As a reminder, the GDPR guarantees that the processing of personal data is carried out respecting fundamental rights and freedoms, as well as the dignity of the data subject with particular reference to confidentiality, personal identity, and the right to data protection.

2.12.2. Complaints and appeals

While the LDT4SSC consortium is responsible for evaluating the proposals and in later stages pilots' performance, approved pilot project consortia are responsible for the complaints and appeals stemming from the implementation of their LDTs. We encourage all affected stakeholders to directly contact the pilot consortia for any complaints. If necessary, the LDT4SSC consortium will remain available for support through the info@ldt4ssc.eu helpdesk email address. Complaints regarding ethical issues will be handed over to the Ethical Board for discussion and proposing further action steps.

2.12.3. Confidentiality, privacy notice and usage of applicants' data

The processing of personal data by the LDT4SSC Consortium adheres to GDPR and its Article 5 principles, ensuring lawfulness, correctness, and confidentiality. Personal data will be processed by the LDT4SSC Consortium members and external evaluators responsible for the evaluation process and selection of the pilots. The applicant warrants and represents that, in providing personal data in connection with the proposal, the data subjects have consented to the provision of their personal data and the processing of it by the designated

[49] Regulation (EU) 2016/679 (General Data Protection Regulation, GDPR), available at https://eur-lex.europa.eu/eli/reg/2016/679/oj/eng
[50] Directive 2002/58/EC of the European Parliament and of the Council of 12 July 2002, available at https://eur-lex.europa.eu/eli/dir/2002/58/oj
[51] Regulation (EU) 2022/868 of the European Parliament and of the Council of 30 May 2022, available at https://eur-lex.europa.eu/eli/reg/2022/868/oj
[52] Regulation (EU) 2023/2854 of the European Parliament and of the Council of 13 December 2023, available at https://eur-lex.europa.eu/eli/reg/2023/2854/oj
[53] Regulation (EU) 2024/903 of the European Parliament and of the Council of 11 April 2024, available at https://eur-lex.europa.eu/eli/reg/2024/903/o
[54] Regulation (EU) 2024/1689 of the European Parliament and of the Council of 13 June 2024, available at https://eur-lex.europa.eu/eli/reg/2024/1689/oj

LDT4SSC consortium members, and that the organisation provides the personal data in accordance with applicable law.

Personal data (e.g., email addresses) can also be used for collecting feedback from applicants. Public sharing of data encompasses, among other things, the disclosure of CfP outcome to the LDT4SSC project's web page (https://ldt4ssc.eu/). This includes aggregated level statistics such as the number of applicants, applicants per country, the sectors covered. Information on each funded activity, including participant information and abstracts of the activity proposal, may be made available for publication purposes as currently expected:

- Details to be made publicly available **before** the end of the pilot: pilot title, names of the Lead Partner and other beneficiaries, short description (as provided by the applicant in the application template).
- Details to be made publicly available **after** pilot completion: pilot title, names of the Lead Partner and other beneficiaries, awarded funding, updated short pilot description and main pilot results (as provided in the Final Report).

The evaluation and selection of applications will be performed under the appropriate ethical conduct and will respect the confidentiality of the information received[55]. The LDT4SSC consortium will treat any proposal, related information and documents confidentially. Personal data will be processed in accordance with the consortium's Privacy Statement (confirmed by the Ethical Board), or as otherwise indicated throughout the proposal form (e.g., applicants, pilot title, summary description etc.).

The LDT4SSC Consortium members will not be able to discuss in detail or contribute directly to the development of the pilot proposal. Selected Evaluation Committee members evaluating the applications are also obliged to sign the Non-Disclosure Agreement and the Conflict of Interest Statement provided by the Ethical Board.

2.12.4. Dissemination of results and Intellectual Property

By default, LDT4SSC follows the principle of openness to also foster reusability and accelerate research and development of LDTs around Europe, while remaining closed to safeguard privacy and Intellectual Property. Consequently, the default approach of the project is open source also for the piloting results. For specific rights and obligations concerning Intellectual Property Rights of the use and dissemination of results generated by pilot teams through funding obtained via the CfP, the LDT4SSC project will refer to the GA signed with the pilots.

Regarding the dissemination and use of results funded by the CfP, recipients must credit the LDT4SSC project with proper citation, and display the LDT4SSC logo and EU flag.[56] This includes consistent use of the EU flag and citation throughout the pilot, stating: "**This project has received co-funding from the European Union's Digital Europe Programme under grant agreement No. 101226211**".

[55] Note that both the LDT4SSC project consortium as well as the pilot consortia must ensure that their contractual obligations under Article 13 (confidentiality and security) among others are followed. See: Annotated Grant Agreement https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/common/guidance/aga_en.pdf

[56] See further details from Annotated Grant Agreement under Article 17.2 (visibility) https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/common/guidance/aga_en.pdf and https://commission.europa.eu/system/files/2021-05/eu-emblem-rules_en.pdf



Figure 5. LDT4SSC logo to be displayed by pilots in their communication



Figure 6. Consistent use of the EU logo to be displayed by pilots in their communication

3. Call for Pilots Process

3.1. Call for pilots timeline

The timings of the call have been defined based on the following rationale:

- The **Open Call application period** is envisioned to last 2 months from the launch. Call is scheduled to open on 23 November 2026 and close on 25 January 2027.
- After the application deadline, the **review of the pilots** will take approximately two months. This comprises the pre-screening check on eligibility as well as the evaluation by the Evaluation Committee and Ethical Board.
- Following the selection of the winning pilots, the **negotiation period will last one month, followed by a preparation phase** before pilot starts. This period is meant to draw on the reviews of the Evaluation Committee and Ethical Board, as some recommendations and requests may be provided to the applicants that could imply changes to the pilot in terms of approach, process and consortium. The negotiation period is a timeframe for providing feedback to applicants and for applicants to address the feedback.
- Each **pilot is envisioned to last between 12 to 15months from the starting date**.

Table 3 summarises the CfP selection process for this Work Strand.

Table 3. Estimated timeline for Call For Pilots for Work Strand 1

Work Strand 1					
	Opening of open call	**Closing of open call**	**Selection of pilots**	**Start of pilots**	**Closing of pilots**
Open call 4	23 November 2026	25 January 2027	1April 2027	1 June 2027	30 June - 31 August 2028

3.2. Documents for submission

As part of the application process, the pilot applicants will be asked to provide the following documentation in order to be considered eligible:

Document type	Description
Application form	General information on consortium details, applicant details, grant allocation request, self-assessment etc.
Financial Form	Details the budget for the pilot proposal.
Letters of Commitment from the Local and Regional Authorities and any other member of the consortium contributing financially to the pilot activities	Statement of intent, affirming the entity's engagement in the LDT4SSC project and its pilot activities.
Ethics and Data Protection Self-Assessment	Showing how the applicant will handle people's information responsibly, fairly, and safely, while also respecting individuals' rights.
Ownership and Control Declaration	Certifies that an applicant's organisation is not controlled by entities from ineligible countries.

These documents are referred to in Annex 1 and are published on the project's website[57].

3.3. Where to apply and how

The full application package (written in English) must be submitted via applications@ldt4ssc.eu before the specified deadline (see Chapter 3.1). The application must be filled in using the predefined templates provided on the LDT4SSC project's website.

All the documents must be sent in PDF format, except the Financial Form, which must remain in an Excel format (.xlsx).

The proposal must be submitted by the consortium member acting as the Lead Partner who is also responsible for completing all administrative information and checking all documents. After submitting the documents, a confirmation email will be sent to the applicants verifying that the application was received and stating the time of submission.

4. Call for Pilots Evaluation

4.1. Evaluation process

Consortia must submit their applications to the call for pilots under Work Strand 1 by **25 January 2027 at 23:59 CET**. After this deadline, the review period **will last two months**, including both the pre-screening of the applications and the evaluation by the Evaluation Committee and Ethical Board. After the **ranking and selection** of the pilots, which will be

[57] https://ldt4ssc.eu/call-one/

communicated to the applicants, the winning consortia and the selection committee will take one month to finalise contract negotiation and signing, and one additional month to prepare before **project launch.** The process is outlined in the following Figure.

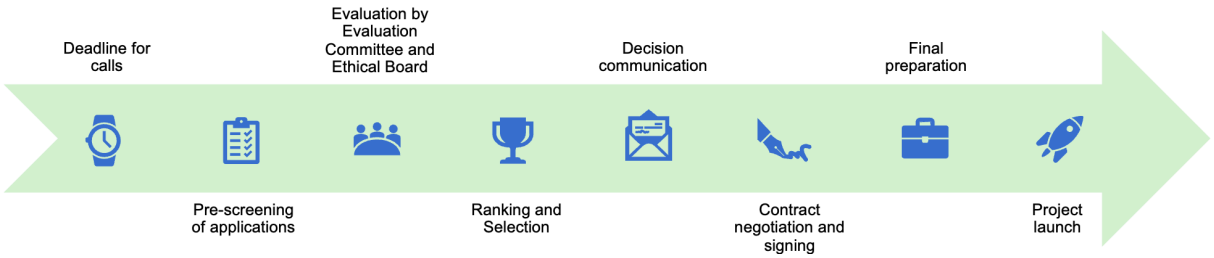

Figure 7. Expected piloting process for the calls

The following sections outline the process for each step:

Pre-screening of the applications through eligibility check

After the deadline for the call has passed, each application will be pre-screened for an eligibility check as a first step. This will ensure that only relevant applications are considered for the evaluation of the Evaluation Committee and Ethical Board (see below).

Applications will first be anonymised and then assessed by the eligibility check grid. The criteria are listed in the table below:

Table 4. Eligibility Check Grid for Work Strand 1 (legal, financial, technical, ethical)

	Eligibility criterion	**How it's demonstrated**	**How it's assessed**
General	All required documents and ownership and control declarations have been submitted in the right format (PDF & Excel) and on time. The application files are submitted in English.	Application Form, Financial Form, Letters of Commitment, Ethics and Data Protection Self-Assessment	pass/fail
	The proposal has been submitted using the Open Call template. This includes respecting the page limit for the proposal template.	Application Form, Financial Form, Letters of Commitment	pass/fail
	All questions have been answered (within the character limits).	Application Form, Pilot Budget, Ethics and Data Protection Self-Assessment	pass/fail
Legal	Pilot consortium consists of at least two local or regional public administrations from two different eligible countries, together with at least one additional partner drawn from one of the following categories: ● Private entity (e.g., service provider) ● Private association (legal status) ● Trusted third party ● Private representative of a use case sector	Application Form, Letters of Commitment	pass/fail

	Eligibility criterion	How it's demonstrated	How it's assessed
Financial	Pilot consortium covers at least 50% of the pilot budget as co-financing.	Applicants demonstrate their capacity to provide at least 50% co-financing in an added budget table and with the Letters of Commitment	pass/fail
	Support requested is not higher than 1.000.000 euros per consortium.	Financial Form	pass/fail
	Support requested is not more than 500.000 euros per third-party across pilots.	Financial Form	pass/fail
Technical and Non-Technical	Pilots must include at least two cross-sectoral use cases, each featuring one shared service. ● The developed services integrate datasets from two or more sectors[58] (e.g. mobility, energy…); or ● The LDTs provide data services that span at least two sectors within a single use case.	Application Form	pass/fail
	Each pilot must include at least two public authorities operating digitally mature LDTs to be interconnected. 'Digitally mature' means having an existing LDT (can also be supported by a data space) with at least descriptive-level capabilities (see explanation in Annex 2) and dynamic data integration. These platforms must already provide digital and data services within their respective cities or communities.	Application Form	pass/fail
Ethical	Ethics and Data Protection Self-Assessment completed and submitted.	Application Form, Ethics and Data Protection Self-Assessment	pass/fail

This eligibility check process should take no longer than 2 weeks. Applicants are encouraged to submit their applications as early as possible before the deadline.

Evaluation by Evaluation Committee and Ethical Board

Once applications have successfully passed the eligibility check, an **Evaluation Team** will assign **expert evaluators** to an **Evaluation Committee** based on their respective areas of expertise.

Each application will be reviewed by two external evaluators and one internal evaluator. All three evaluators will assign scores following a structured evaluation framework which is fully

[58] See list of sectors here: https://single-market-economy.ec.europa.eu/sectors_en

aligned with European priorities and upcoming policies, the Digital Europe Programme (DEP), the Mission on Climate-Neutral and Smart Cities, as well as the DS4SSCC-DEP. These will be then combined to form an aggregate score, which will determine the application's position in the final ranking. The assessment will focus on three primary dimensions: **Excellence, Impact, and Quality and Efficiency of the implementation, as shown in Table 5.**

Table 5. Evaluation criteria

	Evaluation criterion	How it's demonstrated	Minimum pass score	Maximum pass score
1	Excellence	1.1 The proposal clearly defines its objectives and demonstrates strong alignment with EU priorities and LDT4SSC challenges. 1.2 The use cases are well-defined, feasible, and clearly demonstrate the added value of interconnecting LDTs and sharing services. 1.3 The technical and functional architectures are coherent, complete, and supported by appropriate standards, tools, and diagrams. 1.4 The data governance approach is robust, and ethically compliant with relevant regulations (see Section 2.9.1) (and demonstrates responsible integration of AI/XR technologies, when applicable). 1.5 The methodological approach is well-structured, and clearly describes the data lifecycle.	6	10
2	Impact	2.1 The pilot demonstrates clear and measurable benefits for local communities, including socio-economic and environmental gains. 2.2 The proposal shows strong potential for replication across EU cities and meaningful contribution to EU LDT ecosystems and standards. 2.3 The outputs are clearly defined, of high-value, and committed to open publication of data models and services where feasible. 2.4 The pilot includes a credible plan for involving relevant stakeholders and end-users throughout the project lifecycle. 2.5 The proposal presents a realistic and well-supported plan for sustaining and scaling the pilot after project completion.	6	10

	Evaluation criterion	How it's demonstrated	Minimum pass score	Maximum pass score
3	Quality and efficiency of implementation	3.1 Existing community platform, digital twin, or emerging data space is sufficiently mature to reach described objectives 3.2 The consortium demonstrates strong expertise, well-defined roles, and adequate political and organisational support. 3.3 The work plan is clear, realistic, and allocates resources efficiently across tasks and partners. 3.4 The proposal provides a feasible plan for managing data, identity, access, and policies across platforms. 3.5 Risks are clearly identified with credible mitigation measures, and eco-design principles are meaningfully integrated.	6	10

It is envisaged that the **Evaluation Committee** and **Ethical Board** will work in parallel to review the applications during the same timeframe. The Ethical Board's assessment will focus on the pilots' Ethics and Data Protection Self-Asessment and considerations regarding ethical implications of the application's aspects. These include evaluating issues related to data governance, privacy, consent, and transparency in the collection, processing, and sharing of local data. The Ethical Board will also assess potential biases in data modeling and simulation, fairness in the representation of communities, and the risk of reinforcing social or spatial inequalities through digital replication. These assessments will be based on a review of the ethics and data form, as well as a review of the section on "Alignment with Ethical Principles" on the Application Form.

The evaluation will take place in two stages:

Stage 1. Individual Evaluation
In the first instance, evaluators will assess and score the applications individually, providing written justifications in line with a standard template. Alongside this process, selected members of the Ethical Board will review the sections that are relevant for the ethics and the accompanying Ethics and Data Protection Self-Assessment submitted by the applicants.
This draws on the evaluation framework and the evaluation criteria outlined above.

Stage 2. Consensus Group Meeting
Following the completion of individual evaluations, respective members of the given Evaluation Committee for each Work Strand and relevant Ethical Board members who reviewed the applications will convene to discuss their assessments and compare findings. The aim is to reach a consensus on comments and scores, ensuring consistency across evaluations. A moderator from the Evaluation Team will facilitate the discussion, guiding the group towards agreement and guaranteeing that the proposals are evaluated fairly and in accordance with the established criteria.

The outcome of this process will be a consolidated evaluation report, including score justifications and, where applicable, any dissenting opinions. The report is formally signed by the evaluating experts, the Ethical Board representatives involved, and the moderator. The table below visualises the template used by evaluators to assign individual scoring before drawing an aggregate average from three scores.

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Table 6. Preliminary ranking by Evaluation Committee for one pilot

No.	Evaluation criteria	Content evaluated	Score
1	Excellence		Out of 10
2	Impact		Out of 10
3	Quality and efficiency		Out of 10
			Total out of 30

Final decision by the Steering Committee

A Steering Committee shall consist of one representative from each private entity from the LDT4SSC consortium. It is responsible for making decisions concerning the awarding of pilots in collaborations with the Ethical Board and Evaluation Committee.

While the final score is determined by the ranking of the evaluation criteria, it is expected that the Steering Committee will make the final decision based on the following considerations:

- **Priority of the evaluation criteria:** Proposals with an equal final score may be ranked according to the scores they were given for criterion 'Excellence'. When these scores are equal, priority will be based on their scores for the criterion 'Impact'.
- **Recommendations from the Evaluation Committee:** Specific feedback about the scope and quality of the proposed pilots should be taken into account when deciding on the final ranking.
- **Geographical balance:** When possible, geographical diversity should be prioritised in order to ensure that the final set of shortlisted pilots will include different areas of Europe.
- **Domain-based balance:** When possible, diversity of domains should be prioritised in order to ensure that the final set of shortlisted pilots will cover a variety of domains. In the following call rounds, also previously awarded pilots' domains should be considered.
- **Varying maturity levels:** While all applicants must meet sufficient maturity levels for digitalisation, it should be respected that applicants with lower maturity would get a chance to participate in the piloting programme, if deemed reasonable.

Decision communication

The decision of the winning pilots will be communicated shortly after the two-month review period. Applicants will be contacted via email with the final decision and score.

Contract negotiation and signing

Drawing on the announcement about the selected pilots, the contract negotiation period starts, which is expected to last one month before project launch. This period draws on the reviews of the Evaluation Committee and Ethical Board, as some recommendations and requests may be provided to the applicants that could imply changes to the pilot in terms of approach, process and/or consortium. The negotiation period is thereby a timeframe for providing feedback to applicants and for applicants to address the feedback. It encompasses

the process of negotiating, providing and checking the additional information (such as the Ownership Control Declaration (OCD), if necessary) and signing the contract.

Final preparations

Applicants will still have one month after signing and before the start of the project to finalise preparations, such as checking for capacity and resources and ensuring that they are ready in time for project launch.

Project start

Once the contract negotiation and signing is done and preparations are in place, the pilot project kicks off.

4.2. Checklist

To ensure that all necessary steps for successful application submission have been followed, applicants are recommended to run through the following pre-submission checklist (Table 7).

Table 7. Checklist for applicants before Submission

	Activity	**Yes/No**
#1	You have prepared all documents for the submission: Application Form, Financial Form, Letters of Commitment, Ethics and Data Protection Self-Assessment, Ownership Control Declaration	
#2	Your documents are in the right format (PDF & Excel) and answer within the character limits. All sentences and images exceeding the limitations will be hidden from the application for evaluation.	
#3	Your consortium has at least two local or regional public administrations from two eligible countries on board.	
#4	All partners of the pilots are from the eligible countries, and the activity of the pilot will take place in the eligible countries.	
#5	You have described at least two use cases across priority sectors in the Application Form.	
#6	Your consortium does not request more than 1,000,000 Euros and will cover at least 50% of the pilot budget.	
#7	Your pilot complies with the minimal technical and non-technical requirements as described in the technical framework.	

#8	Your LDT pilot complies with relevant regulations, such as GDPR, DGA etc.	

5. Applicants support

5.1. Support during the application phase

The project provides a comprehensive suite of resources to support applicants to the CfP.

- The **Project Website**[59] serves as the central point of reference with information provided on the following:
  - **Frequently Asked Questions (FAQ) Section** – the FAQ addresses frequently asked questions and helps applicants avoid common errors during proposal preparation.
  - **Info sessions dedicated to the call** – 1 information session will be organised on 9 December 2026 to provide additional information and answer questions from applicants, one organised around the call opening, and one halfway throughout the application phase.
  - **Helpdesk** – applicants can submit their questions via the email address info@ldt4ssc.eu.
- The **LDT4SSC Knowledge Hub**[60] provides guidance, resources, and examples from previously awarded pilots, supporting both the preparation and implementation of new proposals. It also collects and organises the project's knowledge outputs, providing applicants and stakeholders with easy access to strategies, tools, and guidance.
- Available **EC policy documents** including priority areas such as the Clean Industrial Deal[61] and New European Bauhaus[62] initiative to define at least two relevant use sectors central in your pilot proposal.

5.1.1. The LDT4SSC Pilot Helpdesk

The **LDT4SSC Pilot Helpdesk** (operated via the email info@ldt4ssc.eu) acts as the single entry to ensure clear, timely and accountable support to both applicants and awarded pilot consortia from application to implementation.

The Pilot Helpdesk provides **practical operational support to applicants on administrative, procedural, ethical/data-protection, and technical matters** relevant to the pilot application process. It also offers implementation support for example regarding reporting requirements, use of project templates, and access to mentoring opportunities.

The Helpdesk will **not provide legal representation, financial audit services, or substitute formal legal or accounting advice**.

[59] See https://ldt4ssc.eu/
[60] See https://knowledgehub.ldt4ssc.eu/
[61] https://commission.europa.eu/topics/eu-competitiveness/clean-industrial-deal_en
[62] https://new-european-bauhaus.europa.eu/index_en

All questions and answers will be published on a dedicated Pilot Support page, which will include a comprehensive FAQ section and relevant contact information.

5.1.2. Confidentiality and data protection

All personal data and case information processed by the Helpdesk will be handled in compliance with GDPR and the project Privacy Statement. Information shared with external evaluators, partners or third parties will be limited to what is strictly necessary and only transmitted after appropriate confidentiality safeguards are in place.

6. Training and supporting activities

Each pilot team is recommended to designate participant(s) to take part in training and support activities. These sessions are designed to address the specific needs of decision-makers and IT experts from local authorities, providing tailored content aligned with their roles, expertise, and knowledge levels.

For each pilot, the expected effort allocation across different roles involved in support activities should be estimated along with the corresponding budget commitment. A suggested estimated contribution is of 80-100 hours across the duration of the pilot. More specific details about the content of the training will be communicated in the beginning of the pilot launch. Training and support activities may include workshops, process support, mentoring sessions, and periodic evaluation meetings.

7. Impact and expected outputs

In the application form (Section 4.1), prospective pilot consortia are expected to describe the tangible changes their initiative is expected to deliver for participating communities, as well as its longer-term impact, including anticipated socio-economic and environmental effects beyond the pilot's direct scope.

Applicants are encouraged to align these expected changes and related indicators with the LDT4SSC impact framework presented in Table 8. These indicators will also be used to establish a baseline and monitor progress throughout the pilot's implementation through the self-assessment process.

This approach helps ensure alignment with the expected impact of the call and consistency in monitoring and assessing the pilots' achievements

Expected outputs (application phase)

Applicants should provide information on the pilot's **context** and **inputs**, and specify a set of **output indicators** supported by relevant **Key Performance Indicators (KPIs)**. In particular, pilots are expected to:

- describe the main **expected outputs/assets** to be produced (e.g. services, tools, data models, datasets, methodologies, or other reusable assets);
- define a coherent set of **KPIs** to measure progress and achievement of these outputs; and

- explain how KPIs will be monitored throughout the pilot lifetime.

Outcomes and longer-term impact KPIs

In addition to outputs, applicants should identify the **desired outcomes** that the pilot aims to contribute to, and explain how these outcomes support the intended **longer-term impact**. Where feasible and appropriate, local administrations are encouraged to select measurable short-term outcomes that can be reasonably linked to pilot outputs.

It should be noted that the learning and results generated by earlier pilots (e.g. services developed, tools tested, and experience gained) may become inputs for later pilots.

As illustrated in Figure 8 below, therefore:

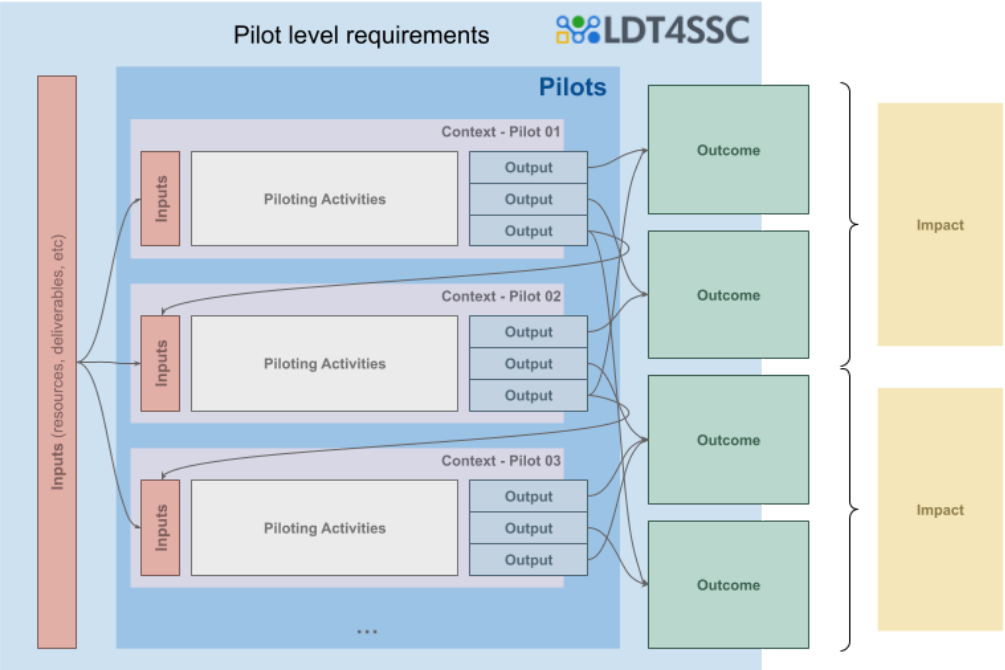

Figure 8. Pilot level requirements for impact assessment

To structure pilots' outputs, outcomes, and impact, pilots are expected to align with the impact assessment framework presented below, which describes the KPIs set by the LDT4SSC project across these different dimensions.

LDT4SSC Impact Assessment Framework

As illustrated in **Figure 9**, the LDT4SSC Impact Assessment Framework structures the pilot intervention logic as follows:

- **Inputs**: resources, enabling conditions, and contributions supporting the pilot, originating both from the project and from the pilot's local context.
- **Activities**: actions implemented by the pilot consortium at pilot level.
- **Outputs**: direct deliverables produced by the pilot (the main assets and measurable results).

- **Outcomes**: broader changes that pilots aim to enable, linked to project-level objectives.
- I**mpacts**: longer-term effects aligned with wider EU priorities, including the EU Green Deal and the UN Sustainable Development Goals.

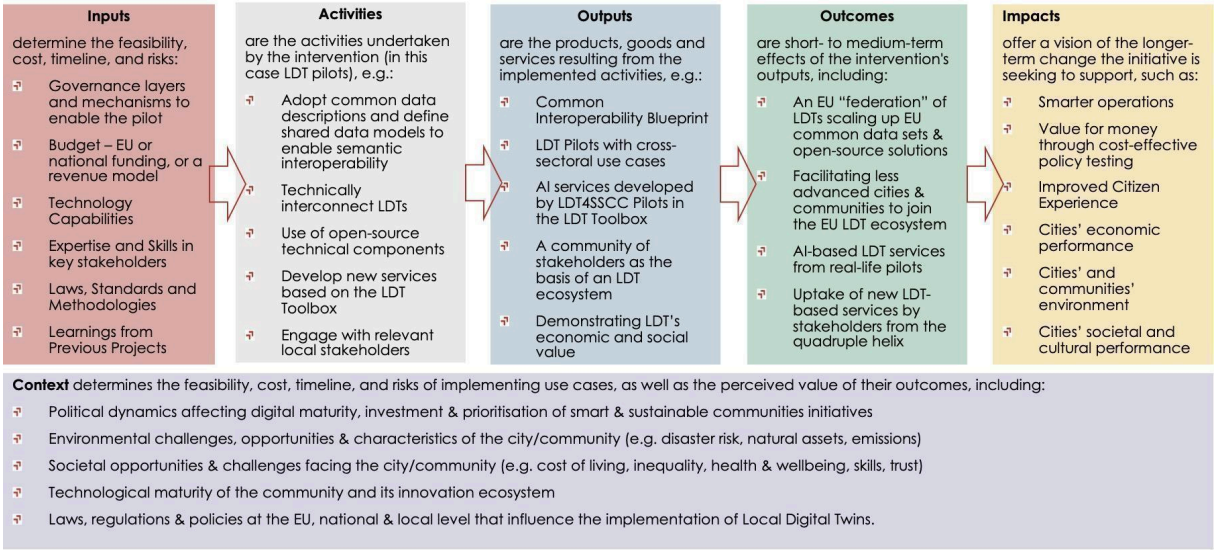

Figure 9. LDT4SSC Impact Assessment framework

Outputs

The products, goods, and services resulting from the pilot activities have targets largely drawn from the KPIs set for the LDT4SSC project overall.

Table 8 showcases pilot outputs as described in the LDT4SSC Impact Assessment Framework. Targets are indicated where appropriate. For some indicators, pilots are asked to provide their own targets.

Table 8. Pilot output indicators for LDT4SSC Impact Assessment Framework

OP1: Operational Local Digital Twins	
LDT instances delivered and made operational by pilots.	
Indicator	**Target**
Number of operational LDT instances delivered	≥ 2
No. of policy or planning domains covered per LDT (cross-sectoral scope)	≥ 2
LDT digital maturity level achieved (LORDIMAS)	'Digitally Optimised'
No. of (dynamic) data sources integrated per LDT	≥ 2
Publicly accessible demonstrator or reference	≥ 1
Measured by: Pilot self-assessment (6-monthly), Validation via demonstrators and technical deliverables	

OP2: Contributions to the Common Interoperability Blueprint	
Technical artefacts enabling interoperability across LDTs.	
Indicator	**Target**
Use of LDT4SSC blueprint	Yes
No. of LDTs interconnected (via SIMPL)	≥ 2
No. of shared datasets exposed to other LDTs	≥ 1
No. of shared or reused data models	≥ 2 (1/sector)
Percentage of exposed data aligned with agreed semantic standards (e.g. NGSI-LD)	100%
Percentage of interoperability-related components contributed back (code, specs, mappings)	50%
Measured by: technical documentation review & compliance and integration evidence	

OP3: Assets and Services Delivered	
Reusable technical assets and services produced by pilots.	
Indicator	**Target**
No. of services[63] or tools delivered	1 service per pilot
No. of services developed/deployed reusing common project infrastructure (SIMPL, EU data cloud)	1
No. of open-source assets	≥ 1
No. of technical documentation	≥ 1
Measured by: Repository inspection & deliverable and demonstrator validation	

OP4: Formalised Stakeholder and Governance Structures

[63] In this context is a means for a public administration to support public activities and/or help the decision-making processes. It should not be confused with the technical definition of a service: in the context of the LDT Toolbox, a service is defined as a deployable software building block that encapsulates a specific capability (e.g., interaction handling, messaging, data access, model control) and exposes it through standard interfaces (Application Programming Interfaces (API)s and/or event-based messaging). It may be delivered as software or Software as a Service (SaaS) and is used to compose LDT functions that support decision-making.

Definition: Institutional and contractual arrangements enabling LDT operation.	
Indicator	**Target**
Existence of a formal governance or collaboration agreement (yes/no)	≥ 1 governance agreement per pilot
No. of stakeholder organisations formally involved	≥ 4
No. of signed data-sharing and/or IP agreements	To be set by pilots
No. of Quadruple Helix actor groups represented	≥ 4 stakeholder types represented
No. of formal coordination events held (workshops, consultations)	≥ 4
Measured by: Legal and administrative documentation & project records	

OP5: Documented Economic and Social Value Propositions	
Evidence packages supporting sustainability and transferability.	
Indicator	**Target**
Availability of a post-project business/operational model for sustaining the LDT	Yes
Demonstrable proof of value creation across the quadruple helix.	Yes/Partly, based on value creation assessment per pilot's service)
No. of transferability or replication studies produced	≥ 1 transferability study across pilots
No. of external policy or strategy documents referencing the pilot's outputs, namely the developed LDT	≥1
Demonstrable proof of the strategic alignment with EU objectives for Green Deal and/or New European Bauhaus per pilot	≥ 1
Measured by: Project Deliverables, Sustainability and ethics as well as external documentation	

Outcomes

The likely short-to-medium-term effects of the pilots' **outputs**, with data to be measured and collected at the pilot level but aggregated to **outcomes** at the project level:

These indicators measure expected **outcomes** resulting from the deliverables of the pilots against a baseline defined by the selected pilots in their first self-assessment:

- Uptake in the number of local platforms and digital twins, with associated services compatible with the EU data cloud infrastructure, reusing interoperable and open-source tools from the LDT Toolbox. LDT4SSC will provide guidance and the resources for pilots to create sustainable, scalable and replicable services by liaising with instruments including the EDIC LDT CitiVerse and the EU LDT Toolbox Marketplace.
- New AI-based services extending and supplementing the marketplace of the EU LDT Toolbox for cities and communities
- Increasing and maturing the AI services offering in the public domain with new predictive and modelling services and immersive solutions, paving the way to the CitiVerse.

Table 9. Outcome indicators of LDT4SSC Impact Assessment Framework

OC1: An EU "federation" of interconnected LDTs	
LDTs scaling up EU common data sets & open-source solutions	
Indicator	**Target**
No. of EU communities (NUTS2 entities) engaged by the pilot: ○ No. of cities or communities (geographical coverage in NUTS2 entities) involved in the pilot ○ No. of relevant contributions, reviews, and implementations by the LDT community to the LDT4SSC common interoperability blueprint	≥2
Improved data sharing efficiency: ○ % reduction in data duplication across pilots ○ avg. time saved per data request	to be set by pilots
Number of LDTs are interconnected through SIMPL as a result of the pilot	≥2
Measurement: Self-assessment by the pilots (6-monthly survey) Validated by analysis of technical documentation of pilot deliverables / demonstrators, such as technical logs, system analytics, etc.	

OC2: Facilitating less-advanced cities & communities to join the EU LDT ecosystem	
Indicator	**Target**
No. of new cities and communities capitalising on the pilot experience	≥2

No. of new cities and communities in the networked LDT ecosystem community.	≥2
No. of best practices adopted elsewhere	≥2
No. of new pilots adopting outputs	≥2
No. of EU communities expressing interest in joining a new pilot	≥2
Measurement: Self-assessment by the pilots (6-monthly survey) Validated by analysis of technical documentation of pilot deliverables / demonstrators, such as technical logs, system analytics, etc.	

OC3: LDT services from real-life pilots	
Indicator	**Target**
No. of open-source contributions	≥2
No. of downloads/reuses of outputs published as open source	To be set by pilots
No. of cross-sectoral use cases implemented	To be set by pilots
No. of shared services in use	To be set by pilots
No. of sectors integrated per use case	To be set by pilots
No. of datasets shared across sectors	To be set by pilots
Measurement: Self-assessment by the pilots (6-monthly survey) Validated by analysis of technical documentation of pilot deliverables / demonstrators, such as compliance reports	

OC4: Uptake of new LDT-based services	
LDT-based services taken up by stakeholders from the quadruple helix	
Indicator	**Target**

Increase in community engagement - i.e. the increase in engaged external stakeholders	50%
Improvements in in-house capacity building	50%
Links to other EU projects	≥2
No. of supporting materials being used for each service, such as documentation, tutorials, guidelines, and other resources designed to assist users and assure replicability, scalability	≥2 per service
No. of local champions trained	To be set by pilots
No. of end-users per service	To be set by pilots
Percentage of services meeting user needs	100%
Measurement: Self-assessment by the pilots (6-monthly survey), including by use of stakeholder surveys by the pilots Validated by analysis of technical documentation of pilot deliverables / demonstrators	

Impact

The primary and secondary long-term effects produced as a result of the pilots – directly or indirectly – related to the pilots' objectives, the longer-term change they seek to support and their expected benefits and beneficiaries. In this case, such longer-term **impacts** refer to **impacts** for citizens and for the cities' services. The following illustrative indicators should be measured where possible, depending on the LDT use case of the pilot.

Table 10. Impact indicators of LDT4SSC Impact Assessment Framework

Category	Indicators	Means of measurement
Smarter operations	• Water infrastructure, e.g. basic supply • Waste infrastructure, e.g. collection frequency and efficiency • Electricity infrastructure, e.g. access or outages • Transport infrastructure, e.g. network convenience, mode availability, emissions intensity	Baseline set and data collected by the pilots

Category	Indicators	Means of measurement
	• Buildings, e.g. public building sustainability • Urban planning, e.g. pedestrian infrastructure	
Value for money through cost-effective policy testing	• Policies successfully developed through LDTs • € saved through efficiency gains	Baseline set and data collected by the pilots
Improved Citizen Experience	• Ranking in Global Liveability Index (EIU) • Ranking in Quality of Living City Ranking	Baseline set and data collected by the pilots
Communities' economic performance	• Ranking in Innovation Cities Index • Ranking in Cities in Motion Index • ICT infrastructure, e.g. WIFI in public spaces • Innovation, e.g. R&D, SMEs or patents • Employment, e.g. unemployment rate in different sectors and demographics • No. of jobs created/supported	Baseline set and data collected by the pilots
Communities' environmental sustainability	• Air quality, air pollution • Water, e.g. water consumption • Waste, e.g. waste treatment • Environmental quality, e.g. noise pollution • Public space and nature, e.g. green spaces • Energy, e.g. renewables • % reduction in carbon footprint • No. of eco-design criteria met	Baseline set and data collected by the pilots
Communities' societal and cultural performance	• Education, e.g. adult literacy, school ICT access • Health, e.g. life expectancy, public health coverage • Culture, e.g. expenditure, infrastructure	Baseline set and data collected by the pilots

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Category	Indicators	Means of measurement
	• Housing, e.g. expenditure, informal settlements • Social inclusion, e.g. poverty, Gini coefficient, voter participation • Safety, e.g. police service, resilience plans, violent crime rate, traffic fatalities • Food security, e.g. local food production	

Pilot specific KPIs as described in the application

Pilots are expected to integrate their pilot-specific KPIs, as described in their application, with the KPIs set by the LDT4SSC project. These indicators remain valid for the project duration and will be reflected by Month 2 in the self-assessment baseline template. The presentation of Pilot KPIs may be adjusted to align with the overall LDT4SSC impact assessment framework, and their monitoring will be demonstrated through the self-assessment template.

Baselines, targets, and method for measuring each of these KPIs, including impact indicators set by pilots, must be updated in a self-assessment KPI template which is due in M2. Where KPIs specified by the pilot at application stage overlap with the Impact Assessment Framework, they will need to be integrated accordingly in order to avoid duplication.

Annex 1 - Required Documents

All documents listed below can be found and downloaded from the LDT4SSC website and should be emailed as an application package to applications@ldt4ssc.eu.

Annex 1.1 Financial form

Annex 1.2 Commitment letter template

Annex 1.3 Ethics and data protection self-assessment template

Annex 2 - Information for context

Information for context: in support of the requirements and recommendations additional information is provided in the following annexes for context purposes.

Annex 2.1 LORDIMAS digital maturity assessment

The **LORDIMAS digital maturity self-assessment**[64] is available for local, metropolitan, and regional governments. This tool focuses on multiple aspects of wider EU-led policy initiatives which are related to governance, service design, data management, interoperability, service delivery, technology and networking.

While filling in the LORDIMAS self-assessment, governments can provide their inputs for the assessment and visualise their results on an interactive dashboard in real time. In addition, the tool enables its users to:

- track their transformation progress over time,
- benchmark themselves against others,
- share best practices,
- get tailored policy recommendations.

While it is **optional** for pilots to fill the assessment for each local or regional government of the consortium, the score may complement the answers to the questions related to digital maturity in the application form.

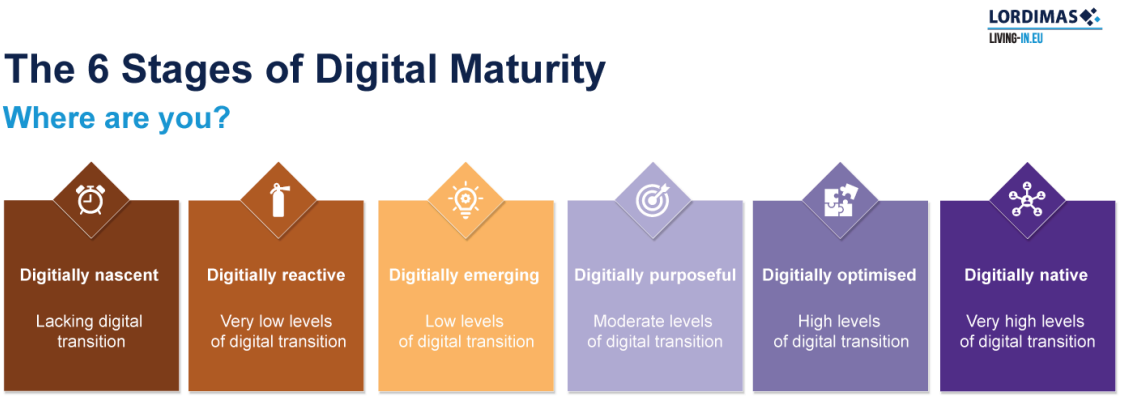

Figure 10. LORDIMAS 6 stages of Digital Maturity

[64] See MaturityAssessment-help | LORDIMAS_EN

Annex 2.2 Capabilities of a Local Digital Twin

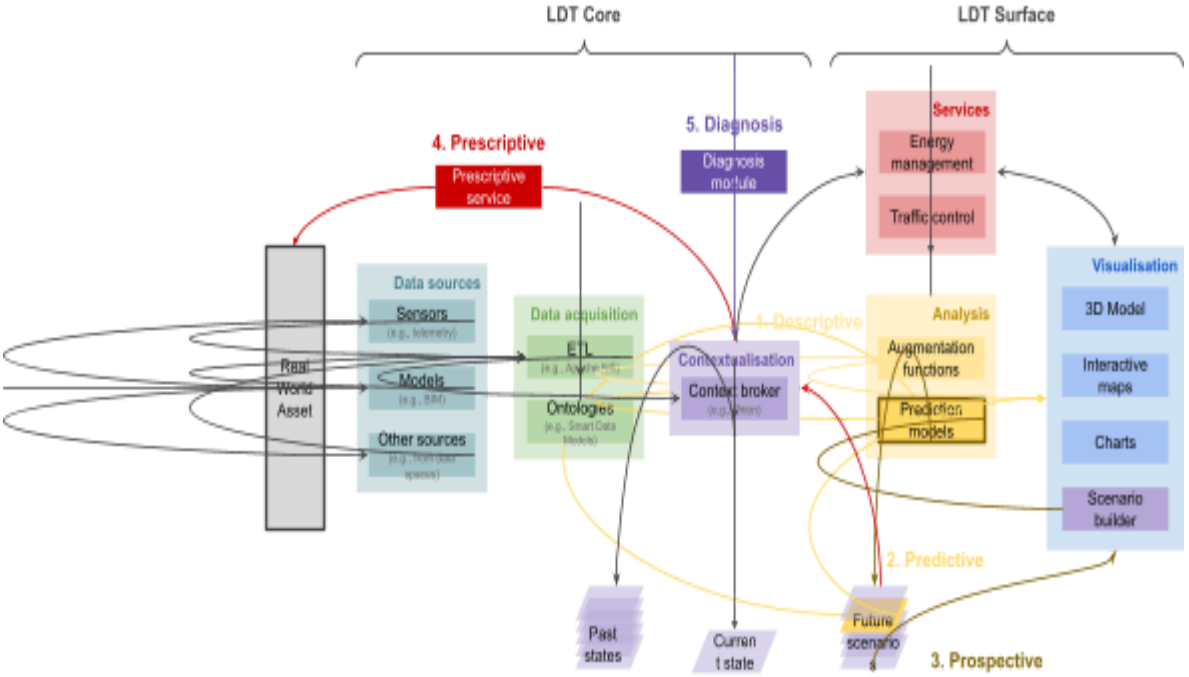

Figure 11. Capabilities of a Local Digital Twin.

The Context Information Management (CIM) European Telecommunications Standards Institute (ETSI) Industry Specification Group (ISG) presents several capabilities for digital twins[65].

- **Descriptive:** Informs on the current state of the real-world assets. The Descriptive Twin presents past and current values of some of the real-world asset characteristics. These characteristics can be static (e.g. a building geometry) or dynamic (e.g. sensor measurements). The connection between the real-world asset and the Digital Twin is bidirectional: a change made in the Descriptive Twin is reflected (in real-time or not) onto the real world asset (actuation). The Descriptive Twin capability does not restrict to metrics collected from the real-world asset and can be augmented with computed functions (e.g. distance to a fixed point of a moving real world asset; deviation from normal of a room temperature)..
- **Predictive:** Extends the descriptive twin capability by providing predictions on the way the real asset could evolve in the future, using predictive models to envision future scenarios.
- **Prospective:** Conducts "what-if" analyses to evaluate the potential consequences of actions, extending the predictive model to multiple possible future scenarios.

[65] See section 6.2: https://www.etsi.org/deliver/etsi_gr/CIM/001_099/017/01.01.01_60/gr_CIM017v010101p.pdf

- **Prescriptive:** Extends (or, in extreme cases, executes) the prospective capability with suggested actions on the real system to achieve a given objective based on the analysis.
- **Diagnostic:** Explains situations or alerts about deviations from expected conditions. Capability for evaluating what happened, especially in the case of a malfunction of the real asset.

Annex 2.3 European Green Deal Policy areas, New European Bauhaus initiative values and LDT4SSC key challenges

European Green Deal Policy areas
• Clean energy, • Sustainable industry, • Building and renovation, • Farm to fork, • Eliminating pollution, • Sustainable mobility, • Biodiversity and ecosystem health and • Sustainable finance.
New European Bauhaus initiative values
• Sustainability, from climate goals to circularity, zero pollution and biodiversity; • Inclusion, from valuing diversity to securing accessibility and affordability; • Aesthetics and quality of experience for people, through design and cultural benefits.
LDT4SSC key challenges
• Climate change, • Energy efficiency, • Mobility, • Waste management, • Biodiversity preservation, • Air quality and • Water management.

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Annex 2.4 Example of a (twice!) cross-sectoral use case

A region develops an LDT to improve the management of their road infrastructures by combining data from different sectors. The LDT brings together information about the roads (e.g. their width, condition and maintenance status) with dynamic environmental data, including weather forecasts and flood risk metrics.

This combination enables the city to provide valuable digital services that cross traditional-sector boundaries. For instance:

- Road engineers can use the LDT to identify which areas require urgent repairs, especially when poor road conditions overlap with upcoming storms or flood risks. This allows maintenance efforts to be better planned and more efficient, reducing long-term damage and improving public safety.
- At the same time, the LDT provides a second data service that is useful to special convoys, heavy vehicles and emergency services as it helps in identifying the safest and most reliable roads in real time. This is particularly important during severe weather, when certain routes may become dangerous or impassable.

By connecting infrastructure and environmental data in one shared data platform, the LDT supports smarter planning, quicker response times and more resilient public services. It illustrates a clear example of how cross-sectoral data integration can lead to more informed decisions and improved outcomes for communities in multiple sectors.

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Annex 2.5 Data governance

Data Governance to…

4. Manage the interconnection through use cases (interconnection of LDTs, etc.);
5. Capitalise on all use cases;
6. Involve all stakeholders for each use case, from the ideation phase to the industrialisation phase of services/digital twins, whether or not they decide to integrate AI.

The implementation of data governance requires:

- a set of common practices,
- standard processes, and
- standard contracts underlying each use case deployment.

For the creation of digital 'Commons' (e.g. data spaces, jointly-created digital twins, etc.), data governance also provides a framework and regulations.

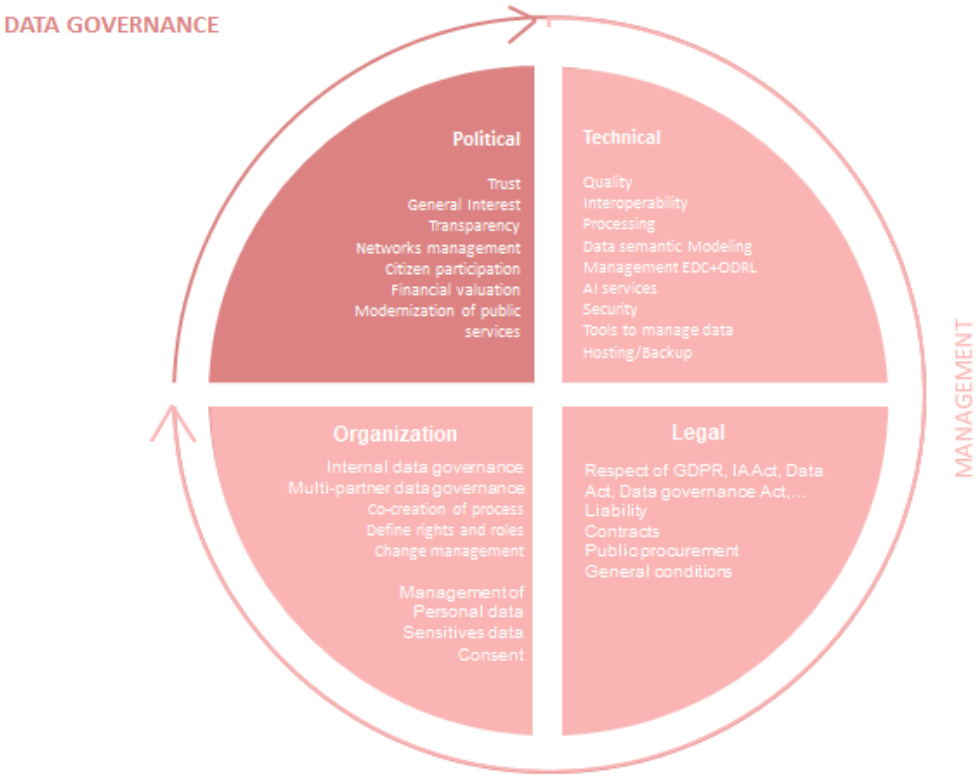

Figure 12. Data governance – A Pilot's strategy throughout political, technical, legal and organisational aspects

Figure 12 illustrates the scope of Data Governance across four dimensions:

- **Political:** this dimension covers the strategic aspects related to data governance.
- **Technical:** this dimension, addressed in terms of technological choices in the technical section of calls for projects, must be linked to other aspects of data governance.

It will deal with topics like how pilots will coordinate with various stakeholders, ensure the technical maintenance and development of the digital twin, etc. It will also aim at understanding the technical infrastructure and architecture.

- **Legal:** this dimension aims to pinpoint the several compliance and legal aspects related to governance, such as how the terms and conditions of use are defined (as previously mentioned), but also it's about broader sections like compliance with EU regulations such as the GDPR etc. It highlights a clear issue of data governance that feeds into the services created (Digital Twins) and of contractualisation between the pilot members at the end of the pilot.

- **Organisational:** this dimension deals with "traditional aspects" one might consider in the scope of data governance, i.e. the management teams and several stakeholders involved, the internal processes etc.

NB: At every stage of the pilot, project-relevant questions should be raised, appropriate clauses included, and recommendations implemented. Key guidance for each stage is provided in D3.4 Non-Technical Resources for Pilots.

NB: When applying AI technologies, particular attention must be given to data governance to ensure full compliance with the AI Act.

Annex 2.6 NACE ("statistical classification of economic activities" in the European Community) Rev. 2 – Level 1 (Sections)

A – Agriculture, forestry and fishing

B – Mining and quarrying

C – Manufacturing

D – Electricity, gas, steam and air conditioning supply

E – Water supply; sewerage, waste management and remediation activities

F – Construction

G – Wholesale and retail trade; repair of motor vehicles and motorcycles

H – Transportation and storage

I – Accommodation and food service activities

J – Information and communication

K – Financial and insurance activities

L – Real estate activities

M – Professional, scientific and technical activities

N – Administrative and support service activities

O – Public administration and defence; compulsory social security

P – Education

Q – Human health and social work activities

R – Arts, entertainment and recreation

S – Other service activities

T – Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use

U – Activities of extraterritorial organisations and bodies

Funded by the European Union

Annex 2.7 High-Level architecture Overview of an LDT with the EU LDT Toolbox[66]



Figure 13. High-Level architecture Overview of an LDT with the EU LDT Toolbox.

In the EU LDT-Toolbox, a Local Digital Twin is described as a system-of-systems typically structured around seven common architectural layers:

- **Data Sources layer.** The "inputs" layer: IoT devices, sensors, databases, open APIs, and data spaces that provide both real-time and static data from the urban environment.
- **Data Acquisition layer.** This layer is responsible for bringing data from heterogeneous sources into the LDT ecosystem and applying the first processing steps—such as ingestion, validation/cleaning, transformation and harmonisation—so that the resulting datasets are consistent and ready for downstream analysis and reuse. In the EU LDT-Toolbox specifications, it corresponds closely to workflow stages such as data ingestion and data transformation. Typical toolbox support for implementing this layer includes the EU LDT Data Platform (data consumption and context brokering capabilities) and EU LDT Data Space Ready (connectivity and integration with data spaces).
- **Knowledge layer.** This layer builds on harmonised data to generate actionable knowledge through advanced analytics, algorithms and AI/ML. It typically covers activities such as data exploration and feature engineering, development and training of models, inference and production of derived datasets, and—where relevant—synthetic data generation to support testing, model robustness or privacy-preserving use cases. Within the EU LDT Toolbox, this layer can be supported by tools such as the EU LDT AI Notebook (for experimentation and model development), the EU LDT Data Modeller (for structuring and managing data models), and EU LDT Federated Learning (for distributed model training across multiple data holders).
- **Interoperability layer (orthogonal).** This is a cross-cutting, "across-the-stack" layer that enables consistent communication and coordination between the subsystems composing an LDT as a system of systems. It ensures that components can interoperate through agreed interfaces and semantics, and it supports long-term extensibility by allowing the LDT to integrate external systems and services that were not originally

[66] See https://interoperable-europe.ec.europa.eu/collection/ldttoolbox/knowledge-center

foreseen. In this respect, the EU LDT Toolbox treats interoperability as a central design concern, with Minimum Interoperability Mechanisms (MIMs) and relevant standards acting as the “glue” that enables compliant, reusable, and scalable interactions across components.

- **Services layer.** This layer provides the functional capabilities consumed by LDT use cases and interfaces with specialised municipal services and operational applications (e.g., energy, water, mobility/traffic, environment). It exposes domain and platform functions through well-defined interfaces (typically APIs and/or event streams) so they can be reused and composed across scenarios. In the building-block view, service-like components include, for example, a Context Broker, which integrates and manages context information from multiple systems and can act as an integration gateway—potentially also supporting actuation pathways—alongside related data-service components that enable access, querying and dissemination of LDT data.
- **Orchestration layer.** This layer composes and coordinates data models, services and workflows to implement end-to-end LDT use cases, including the execution of what-if analyses and simulations. It provides the control plane for managing scenarios and ensuring that the right components are invoked in the right sequence (or in parallel) with the appropriate data and parameters. In the EU LDT Toolbox, this corresponds to capabilities such as use case/scenario management and data workflow & component orchestration, including task scheduling, dependency management, parallel execution, operational monitoring and logging.
- **Visualisation layer.** This layer delivers the user-facing interfaces that enable stakeholders to explore, understand and communicate LDT information and results through advanced visualisation and interaction mechanisms (e.g., dashboards, 2D/3D views and digital maps). In the EU LDT Toolbox specifications, this includes capabilities such as geospatial visualisation, analytical visualisation components for interpreting model outputs and indicators, and XR services (AR/VR) that support richer interaction, engagement and immersive exploration where appropriate.

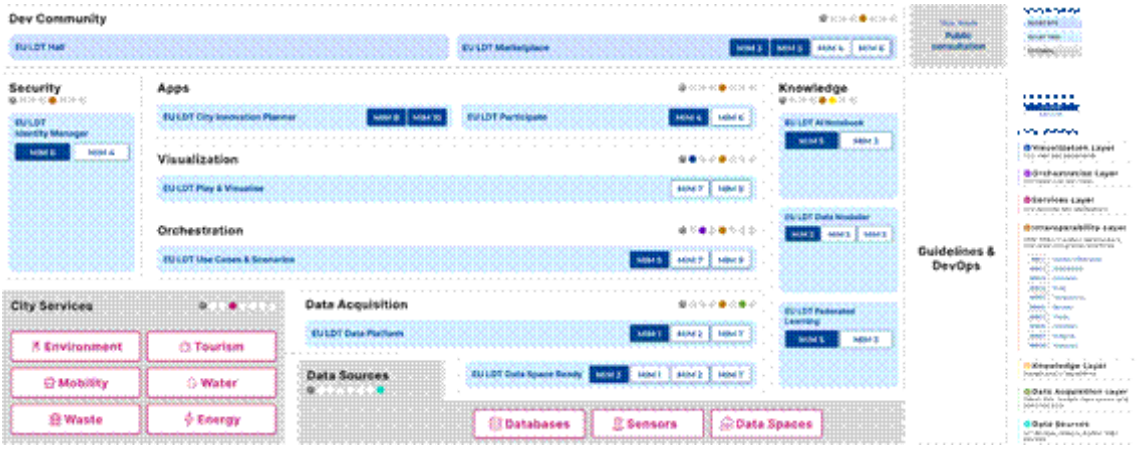

Figure 14. LDT Toolbox solutions structure with layers and MIMs Plus

Annex 2.8 LDT4SSC Methodology[67]

The LDT4SSC methodology is structured in four main phases:

- **EXPLORE - Ideation:** generating user-centred use cases.
- **VALIDATE - Specifications:** specifying the functionalities of the solution that meets the need.
- **DEFINE - Prototyping:** testing the first solutions quickly and cost-effectively.
- **IMPLEMENT - Deployment:** structuring an operational, scalable and sustainable project.

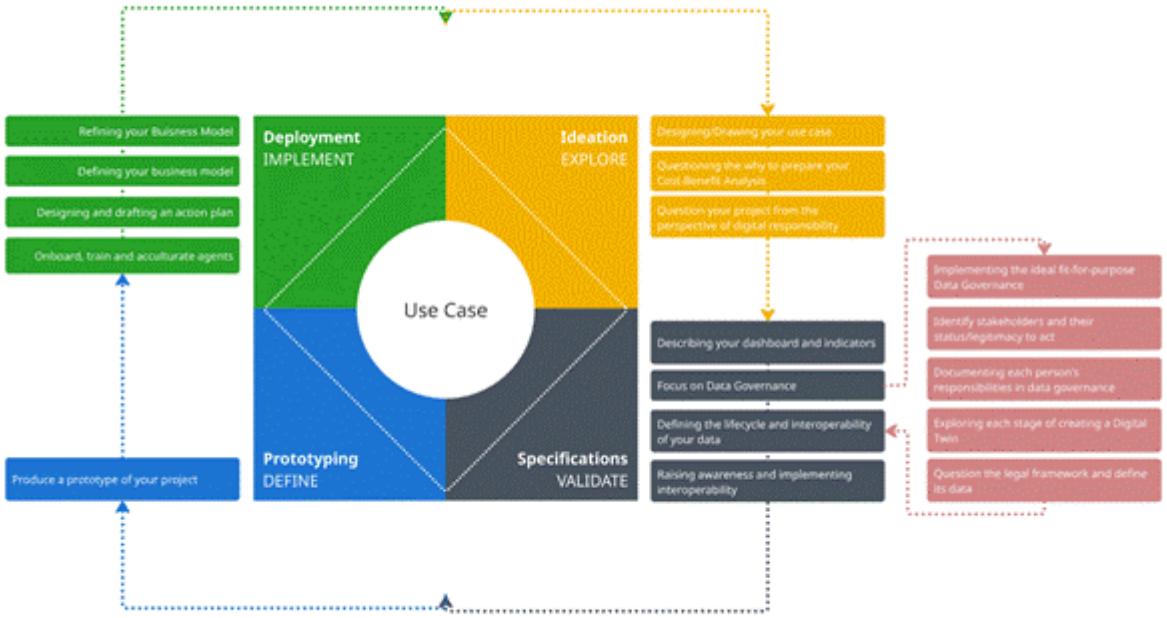

Figure 15. Overview of the LDT4SSC Methodology steps and proposed workshops.

Each of these stages mobilises appropriate tools and resources. The methodology is distinguished by the particular attention paid to **data interoperability, contextualisation** (semantic modelling) and the use of an infrastructure that **facilitates re-use**.

It is a method based on the two editions of the French CAPACIties programme.

[67] See https://knowledgehub.ldt4ssc.eu/resources_content/non_tech_resources/#the-ldt4ssc-methodology

Annex 2.9 Revised List of potential pilot project assets for the LDT4SSC Assets and Services Repository

This annex provides an indicative categorisation of pilot-produced assets that may be considered for contribution to the LDT4SSC Assets and Services Repository. In this context, an asset is any digital artefact produced, adapted, or formally contributed by a pilot that can support the operation, reuse, sharing, transferability, or replication of a LDT.

The Assets and Services Repository is intended to present assets that provide value beyond the individual pilot context and that may be reused by other pilots, project partners, cities, communities, or external stakeholders. It is not intended to function as a general storage space for all materials generated during pilot implementation, but rather as a curated environment for mature, documented, and shareable artefacts.

Further information and guidelines will be provided to pilots on the Assets and Services Repository, its implementation and the expectations for pilots to share the assets, services and accompanying comprehensive documentation.

Category	Description	Examples
Reusable technical assets	Digital artefacts that directly support the design, development, deployment, operation, or extension of Local Digital Twin solutions. These assets should be sufficiently mature, documented, and technically reusable by other pilots or external stakeholders.	Datasets, where legally shareable and appropriately documented; data models; ontologies; semantic schemas; algorithms; scripts; software components; analytics code; AI models; machine learning artefacts and metadata; services; microservices; dashboards; 2D/3D visualisation components; XR/VR components; simulation components; scenario builders; Docker or Kubernetes manifests; KServe packages; deployment scripts; infrastructure configurations.
Reusable non-technical assets	Organisational, governance, legal, and methodological artefacts that support the implementation, transferability, and sustainability of Local Digital Twins. These assets are important for replication across different local contexts and should be sufficiently generic and, where necessary, anonymised.	Governance models; stakeholder engagement templates; operational workflows; legal clauses; contractual templates; data-sharing frameworks; policy models; rights and permissions expressions; ODRL-based policy artefacts; sustainability or business model templates; eco-design statements.

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Table 11. Reusable technical and non-technical pilot project assets.

Accompanying elements

The assets listed above should, where relevant, be accompanied by the documentation, metadata, and contextual materials needed to ensure their discoverability, understanding, and practical reuse.

Category	Description	Examples
Supporting documentation and metadata	Materials that make technical and non-technical artefacts understandable, discoverable, and reusable. These assets provide the context, instructions, and metadata required for interpretation, deployment, maintenance, and reuse.	User guides; technical documentation; API documentation; implementation guidelines; installation and configuration instructions; data catalogue entries; provenance information; metadata records; ownership details; dependency descriptions; maturity information; licensing information.
Reference and supporting materials	Additional materials that may help explain, contextualise, or support pilot assets, but that should not automatically be considered reusable assets unless they provide clear value beyond project reporting.	Selected technical reports; methodological notes; explanatory annexes; pilot reports containing reusable templates, methods, or guidance.

Table 12. Accompanying elements to pilot project assets.

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