SPINE

Smart Public
transport Initiatives
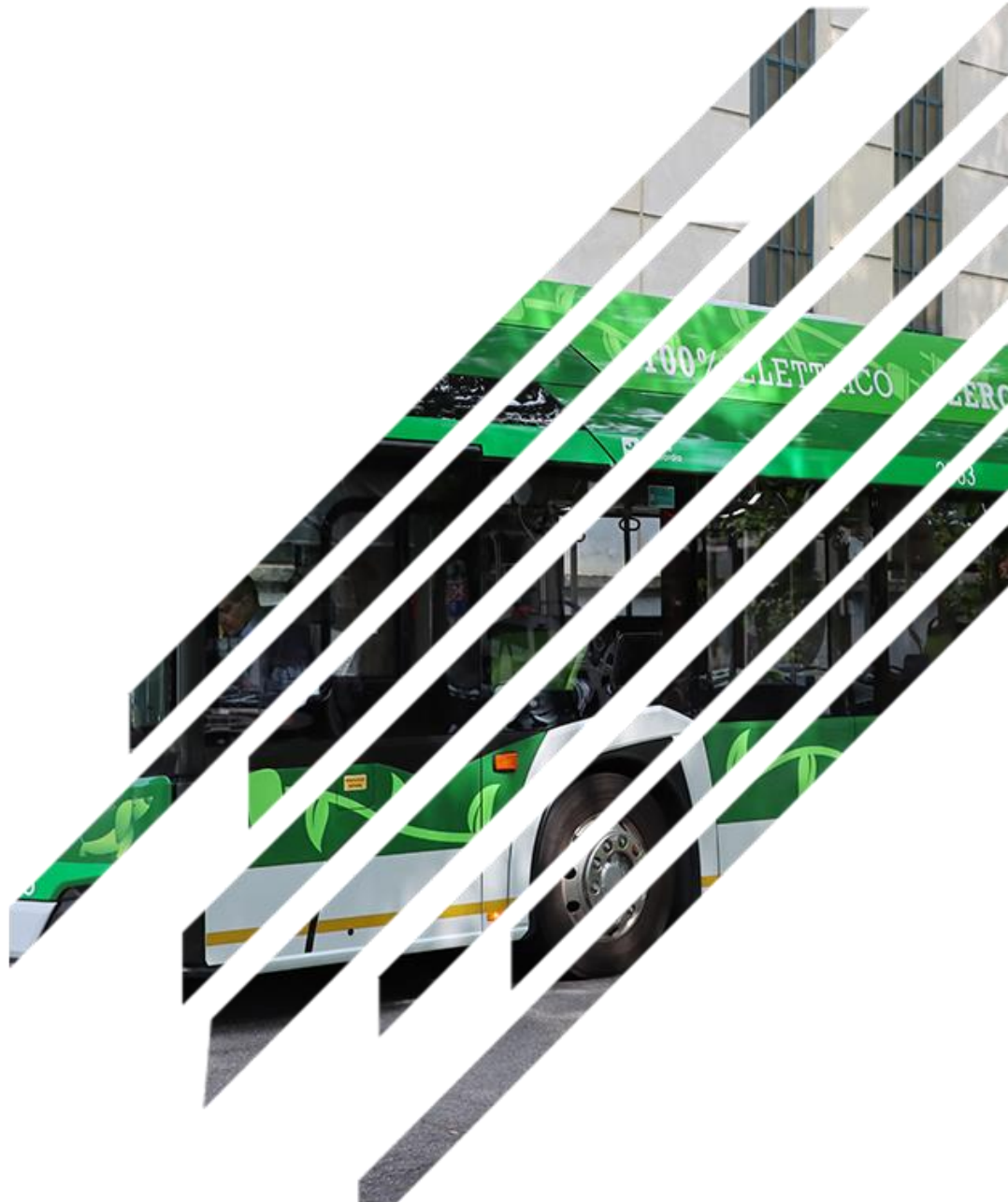for climate-Neutral
cities in Europe

Smart Public transport Initiatives for climate
Neutral cities in Europe

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D7.1 SPINE Quality Handbook and Risks Registry

Document Summary Information

Grant Agreement No	101096664	Acronym	SPINE
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Glossary of terms and abbreviations used

Abbreviation / Term	Description
CA	Consortium Agreement
GA	Grant Agreement
LL	Living Lab
MaaS	Mobility-as-a-Service
PC	Project Coordinator
PST	Project Steering Team
PM	Person Months
QA	Quality Assurance
QAP	Quality Assurance Plan
QMP	Quality Management Plan
QM	Quality Manager
ToC	Table of Content
WP	Work Package

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1 According to SPINE's Quality Assurance Process

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1 Executive Summary

This report provides an extensive quality control handbook defining procedures that will be followed in SPINE regarding quality assurance and risk management. The document will be updated every 6 months and will be an integral part of management periodic reports.

The present quality control handbook describes the mechanisms and collaboration tools that will be used throughout the project. More specifically, it details the project governance bodies, roles and responsibilities, procedures (risk and management, reporting, etc.), It explains how the project will execute its day-to-day activities from a quality perspective, and ensures that standards, processes, and procedures are defined, and their execution is continuously monitored, corrected when necessary and improved.

The quality assurance and risk management processes described in this document aim at:

- Supporting the project development and provide continuous feedback on the extent the project objectives are accomplished;

- Allowing the project results to be improved by comparing the identified objectives and the established processes;

- Supporting the project decision-making process by evaluating the results;

- Monitoring the involvement of all project partners and other stakeholders in development of digital solutions for their acceptance and uptake;

- Identifying any risks and potential issues/obstacles related to the solutions/measures implementation in the SPINE Living Labs (LLs) and proposing mitigation measures.

2   Introduction

This deliverable describes quality assurance activities, which monitor and verify that the processes used to manage and create the deliverables are followed and are effective, as well as quality control activities, which monitor and verify that the deliverables meet the defined quality standards.

This report also defines roles, responsibilities, procedures and tools available for the following project management activities:

- *Project governance;*
- *Overall project monitoring;*
- *Communication and collaboration;*
- *Production of deliverables, publications and other project documents;*
- *Risk assessment plan identifying threats to the project, their associated risk and mitigation measures*

2.1 Mapping SPINE Outputs

The purpose of this section is to map SPINE's Grant Agreement commitments, both within the Deliverable 7.1 content and Task 7.2 description, against the project's respective outputs and work performed.

Table 1: Adherence to SPINE's GA Deliverable & Tasks Descriptions

SPINE GA Component Title	SPINE GA Component Outline	Respective Document Chapter(s)	Justification
DELIVERABLE			
D7.1. SPINE Quality Handbook and Risks Registry	*an extensive quality control handbook defining procedures that will be followed in SPINE regarding __quality assurance__ and risk management*	*Chapter 3*	*Chapter 3 presents the project management governance structure, project monitoring process and project communication and repository of the SPINE project.*
	an extensive quality control handbook defining procedures that will be followed in SPINE regarding __quality assurance__ and risk management	*Chapter 4*	*Chapter 4 presents managerial actions and quality process aiming at smooth LLs progress and co-creative tasks and the implementation of the innovative solutions in the SPINE cities*
	an extensive quality control handbook defining procedures that will be followed in SPINE regarding __quality assurance__ and risk management	*Chapter 5*	*Chapter 5 presents the quality control of the deliverables, coordinating closely on technical quality checks with the Task and WP Leaders and the PC*
	. an extensive quality control handbook defining procedures that will be followed in SPINE	*Chapter 6*	*Chapter 6 presents risk assessment plan identifying threats to the project, their associated risk and mitigation measures, contingency*

	regarding quality assurance and _**risk management**_		plans on potential risks in order to cope with the problems.
TASKS			
T7.1 Project and technical coordination	Delivering the SPINE outputs timely/on-budget in line with the EC reporting requirements. It comprises the monitoring, control and execution of all administrative and financial dimensions of the project workplan adhering to schedule, resources and plan. In summary this involves: a) _guaranteeing the consistency between work plan and financial guidelines;_ b) _compiling reports for the EC;_ c) _ensuring the smooth allocation of Consortium funds and budget;_ d) _coordination of partners administrative and financial obligations;_ e) _directing the review procedures_ f) _providing guidelines on the scientific and technical aspects of the project, supervising technical activities of the different WPs to ensure consistency and quality;_ and g) _planning general assembly meetings._	_Chapter 3_	
T7.2 Quality Management and Risk Mitigation	Ensuring a smooth progress of the scientific and technical work in SPINE, as well as the LL progress and co-creative tasks and the implementation of the innovative solutions in the cities	_Chapter 4&5_	
	Providing Risk mitigation plans	_Chapter 6_	

2.2 Deliverable Overview and Report Structure

Section 3 of this report presents the SPINE project management governance structure, project monitoring process and project communication and repository of the SPINE project. The Quality Assurance Plan (QAP) aiming at smooth LLs progress and co-creation tasks and the implementation of the innovative digital solutions in the SPINE LL cities is included in Section 4.

Section 5 focuses on breakdown of work in terms of quality assurance stages and Timeline for preparation and submission of SPINE's Deliverables.

In Section 6, Risk management plan together with the risk mitigation measures for the early identified risks for project implementation and Living Labs activities is presented. A summary of work is also presented in Section 7.

3 Project governance and overall project management

SPINE Governance

This section covers the Project Management governance structure for the SPINE project. SPINE is assembling a unique team of 39 partners in order to achieve its goals towards climate neutrality and increase in public transport use and satisfaction. The success of these goals is very much correlated with the effectiveness of the project management procedures. It is imperative to have clearly assigned roles and responsibilities, documented procedures, predefined/regular communication paths and escalation processes. This allows the partners to proceed with their work while taking into account the schedule and budget constraints. It also includes the appointment of a Quality assurance manager who is responsible for the quality planning, quality control and quality assurance throughout the project lifecycle. The Quality Assurance (QA) and the overall governance structure is enabling effective practices that can help ensure that the project meets the required quality results.

The ambition of the proposed governance structure, which is presented in Figure 1. below, is to allow the 11 cities who are involved in the SPINE Living Labs, to progress with the co-creation activities and form a collaborative and innovative ecosystem. Therefore, this hybrid design approach will support the needs of the stakeholders and the European Commission, while aligning the envisioned solutions implementations with allocated resources, budget and time plan. In addition, the management strategy supports the continuous internal progress monitoring by the Project Coordinator, early identification and adoption of mitigation measures for any risk which may arise, and the delivery of innovative and quality research results.

In conclusion, a well-defined, robust and comprehensive Project Management structure ensures increased efficiency, reduced risk, better decision-making and positive project outcomes with the required quality standards.
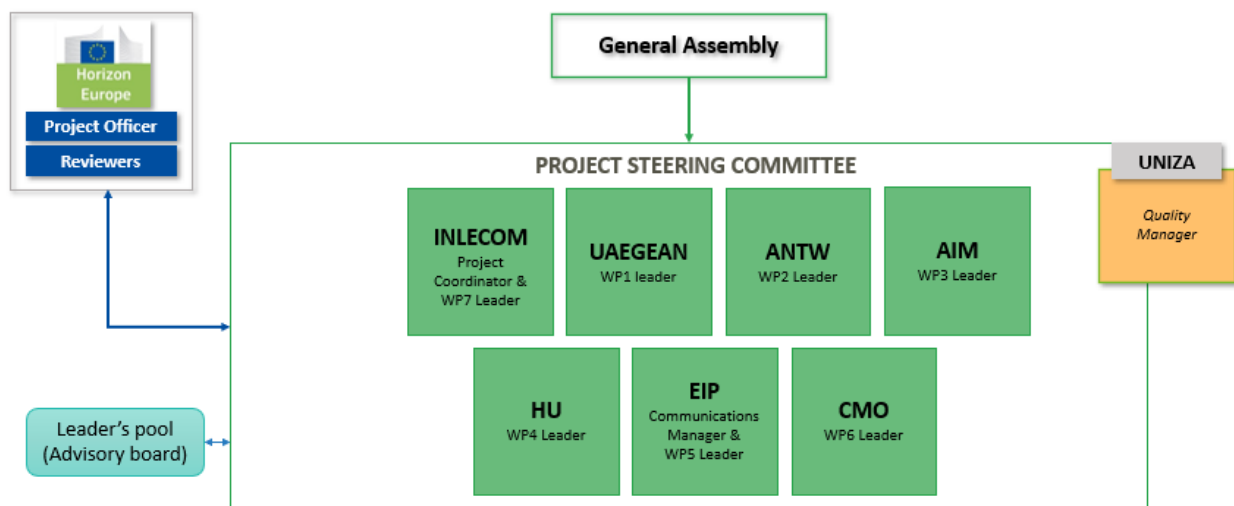
Figure 1. SPINE Governance Management Structure

Consortium Bodies included in the SPINE governance structure:

Project Steering Team (PST)

The Project Steering Team (PST) is a supervisory body for the execution of the project. It provides guidance and oversight throughout the project's lifecycle. It serves as a governing body that ensures the successful delivery of the project by staying on track, on budget and meeting its objectives.

More specifically, its main duties are:

· Review (and revise if needed) the work plan for the coming Project period;
· Evaluate and review progress and status reports;
· Discuss issues concerning the management or smooth running of the Project which may require attention;
· Resolve sensitive technical, administrative or contractual issues;
· Monitor coherence and partners integration in the Project;
· Identify and analyse potential risk factors, and determine the necessary measures to minimise those, recording this in a risk register;
· Discuss and provide opinion on changes in the consortium if necessary;
· Discuss and provide opinion on proposed changes to the Grant Agreement(GA) or to the Consortium Agreement (CA);
· Deal with first level conflict resolution.

The SPINE Project Steering Team is led by the Coordinator (INLECOM) comprising also the Communications manager (EIP), the Quality manager (UNIZA) and the WP Leaders. More specifically, the roles and names are listed in the table below.

Table 2. SPINE Steering Team Composition

Project Role	Partner	Contact Person
Project Coordinator & WP7 Leader	INLECOM INNOVATION	Makis Kouloumbis, Sissi Koronaiou
WP1 Leader	UNIVERSITY OF THE AEGEAN	Ioanna Pagoni, Amalia Polydoropoulou
WP2 leader	STAD ANTWERPEN	Chris Van Maroey
WP3 leader	AIMSUN	Juan Angarita, Mark Brackstone
WP4 leader	HALMSTAD UNIVERSITY	Vaike Fors, Jesper Lund
WP5 leader & Communications Manager	EUROPEAN INTEGRATED PROJECT	Lucia Cristea, Iolanda Moldoveanu
WP6 leader	CAMBIAMO	Floridea Di Ciommo, Maria Alonso
Quality Assurance (QA) Manager	UNIVERSITY OF ZILINA	Ghadir Pourhashem, Tatiana Kováčiková

Leader's pool (Advisory Board)

SPINE consortium is further enhanced by the Advisory Board comprising distinguished leaders in different domains of the industry. The Leader's pool will evaluate all outcomes and provide critical input with respect to stakeholder requirements, societal and users' priorities, regulations, and socio-economic impacts and exploitation.

General Assembly (GA)

The General Assembly is the ultimate decision-making body of the consortium. The Project Steering Team reports to the General Assembly and it has the power to take strategic decisions on all activities and implementations, escalated risks and problems as well as major changes.

SPINE work plan and structure

The SPINE project has a duration of four years, starting 01 January 2023 and completing 31 December 2026. The work plan is divided into 7 Work Packages with respective goals, tasks/subtasks and deliverables. The table below shows the Work Package structure and corresponding PMs.

WP#	Work Package	Leader	PMs	Start	End
WP1	SPINE innovation and twinning framework	UAEGEAN	116	1	9
WP2	LLs setup and operation	ANTW	322	3	36
WP3	Digital Enablers of SPINE Mobility Solutions	AIM	260	2	36
WP4	Twinning cities: Setup and operation	HU	384	10	42
WP5	Exploitation, scaling up and communication	EIP	272	1	48
WP6	Policy recommendations and guidelines	CMO	87	24	48
WP7	Project Management	INLE	94	1	48

Table 3. SPINE Work package breakdown

The GANTT chart below illustrates the overall project schedule, as well as the start and end dates of each individual task and its duration.
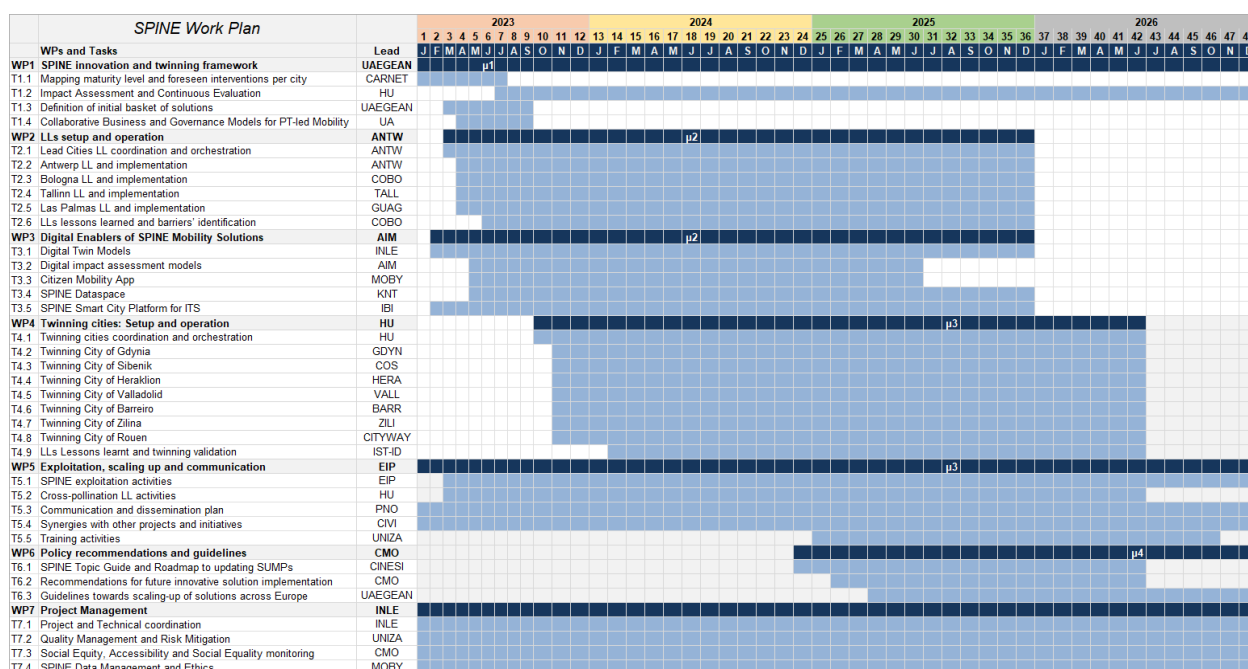
Figure 2. SPINE GANTT Chart

The PERT chart below reflects the SPINE hybrid design thinking methodology and an agile co-design/development/deployment approach, integrating feedback loops.
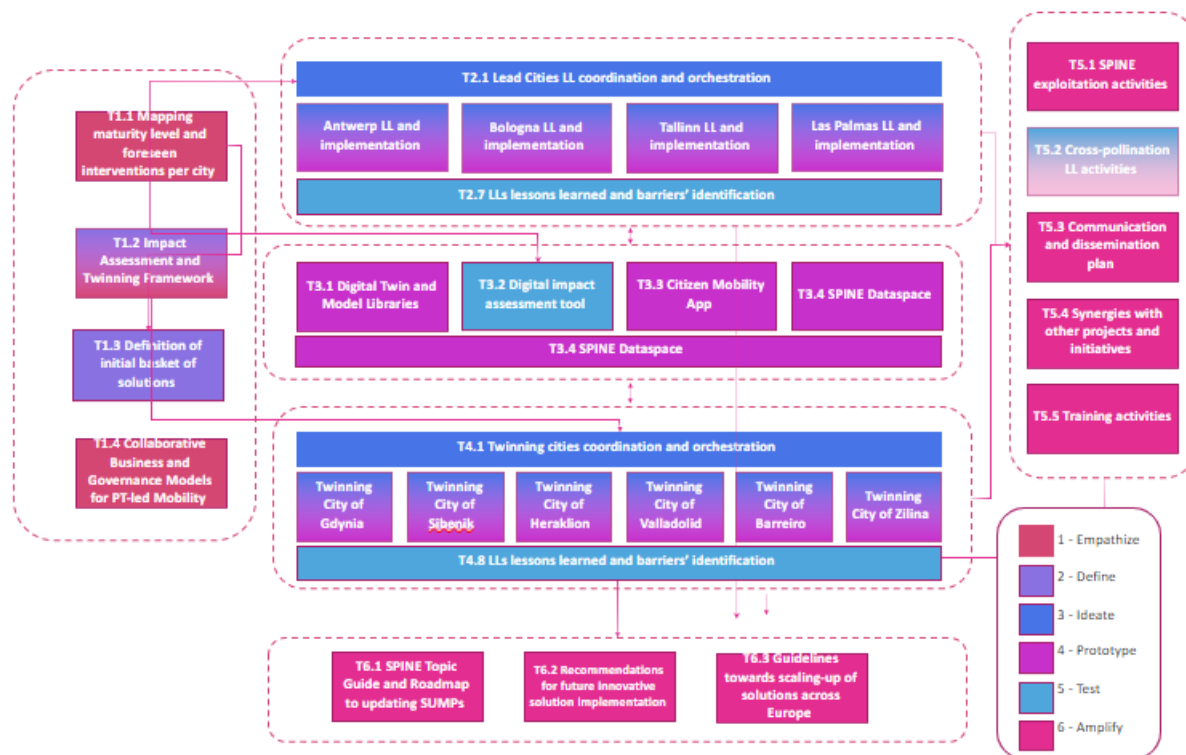
Figure 3. SPINE Pert Chart

The table below shows the milestones, their estimated time of completion and means of verification.

Table 4. SPINE Milestones

Milestone#	Milestone Name	Date	WPs	Means of verification
1	Planting the seeds	M6	WP1	D1.1- Initial setup of LLs and Discussion of Potential Solutions short-listing
2	Fertilizing	M18	WP3, WP2	LLs in lead cities and implementation of innovative solutions (Digital-Physical Impact)
3	Cross-pollination	M32	WP5, WP4	LLs in Twinning Cities and Implementation of Innovative Solutions twinning activities (Physical Impact)
4	Transplanting	M42	WP6	Guidelines to scaling up, transferring & Policy Recommendations

Project monitoring

This section presents the details of the monitoring processes which have been defined from the beginning of the project. They allow a transparent view for all participants and a clear escalation path which should be followed if needed. With the close monitoring and frequent meetings, all work carried out is assessed, potential risks are identified, and mitigation measures and actions are discussed.

Project meetings

- The PST meets monthly to discuss progress, planning, risks & issues, assistance required from the coordinator and the PST and make decisions. Each WP leader also represents the respective partners and exposes their views and concerns.
- The Work package leaders organize a monthly call with all task leaders and relevant partners, to discuss progress, agree on direction and address issues/risks. The coordinator is also invited and what is mentioned in these meetings will then be reported to the PST.
- The Project General Assembly meetings will be held every 12 months, but exceptional meetings can be scheduled if necessary.
- The official Project review meetings are three in total and are set for M18 (Brussels), M36 (Online) and M48 (Brussels(tbc)).

All meeting minutes are uploaded in the respective WP folder in TEAMS repository of the Project Coordinator (INLECOM) and the actions registry is followed up by the Project Coordinator (for PST) and the Work Package Leader (for WP meetings).

Project Communication and Repository

Communication tools

The consortium partners communicate mainly via email. Distribution mailing lists were created at the beginning of the project by the Project Coordinator to facilitate communication. Those lists include (i) one for all project partners, (ii) seven for each WP, (iii) one for the Project Steering Team and (iv) one for the financial representatives from each partner. Each partner declares the lists they wish to be included in, and if additional lists or modifications are required, these are handled by the Project Coordinator.

Project Collaborative space and repository

The Coordinator has created a collaborative workspace for the SPINE Consortium in MS Teams. Each partner has been given access to the Project Teams Area and can actively contribute to the communication and content creation.

Changes to the members of the SPINE Project Teams Area can be made only by the Coordinator on request by the respective Partner. This includes adding or deleting members. When a new member is added, the respective person receives an email invitation to join the SPINE Project Team and a link.

The project team members can download and upload documents, edit documents directly in the Teams area, either using the web interface or through the desktop application. Multiple members can work on the same document at the same time, making collaborative working easier.

Each WP consists of its own individual channel in which members can generate posts, comment/respond on posts. The posts will be visible to all Team members. When there is a new post in a channel, the channel name font changes to **bold.** In order to increase the visibility to the post, the members can mention another member (using *@ [member username]*) Tags.
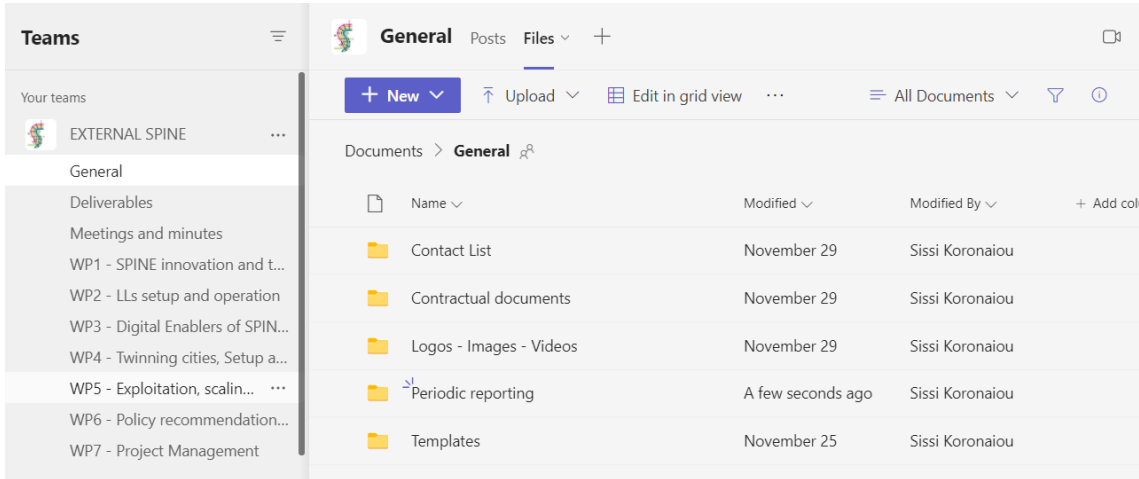
Figure 4. SPINE Project TEAMS Area

Communication channels and structure

Channels are dedicated sections within a team to keep conversations organized by specific topics. The SPINE Project Team Area is composed of 10 channels, based on the project work organisation and the auditorium for the specific information, published in the respective channel. All partners have access to the information provided, the files located in the respective channel and can participate in the discussions to the respective channel chat.

The SPINE project files are stored on INLECOM's SharePoint server. MS Teams provides access interface to them. The organisation of the repository follows the structure of the channels, e.g., the files, related to the delivery of each WP are located in the respective WP channel, tab Files. The initial file structure has been created by the coordinator. However, the WP Leader and team can adapt the file structure for their needs. The maintenance and update of the WP channel and WP documentation is the responsibility of the WP Leader.

The organisational structure of the channels and their intended purpose, primary audience and access level are provided in the following table.

Table 5. SPINE TEAMS Organization structure and access rights

Channel Name	Description	Intended primary audience	Access rights
General	Folders containing files stored: Contractual documents (GA, CA, NDAs & Support letters); Contact list; Document templates; Logos - images - videos; Periodic reporting (per quarter per WP)	All Teams members	All Teams members
Deliverables	All deliverables shared documents, information and posts; all versions in .docx and .pdf format	All Teams members	All Teams members

Channel Name	Description	Intended primary audience	Access rights
Meeting and Minutes	Project Meetings information to be stored here as well (decisions, meeting agendas, presentations, minutes, etc.). Folders: Advisory Board, Kick off Meeting, Project Steering Group	PSG members and All Partners	All Teams members
WP1 - SPINE innovation and twinning framework WP2 - LL set up and operation WP3 - Digital Enablers of SPINE Mobility Solutions WP4 - Twinning cities: Setup and operation WP5 - Exploitation, scaling up and communication WP6 - Policy recommendations and guidelines WP7 - Project Management	Collaborative workspace for delivering of the respective WP. All WP deliverables (draft and final), shared documents, meeting related files, planning information and posts related to WP should be included here.	Partners collaborating with and delivering the respective WP	All Teams members

4 Quality assurance Plan (QAP)

This chapter focuses on the SPINE plan for monitoring, assessing, and reporting quality assurance (QA) activities associated with processes that will ensure the final products (i.e., solutions and tools) of SPINE are of the utmost quality and meet all GA requirements as well as the project's objectives and targets. The QAP contains a set activity meant to ensure that 1) customers (i.e., stakeholders and end-users) are satisfied with the developed solutions /services, 2) project's deliverables meet the envisaged quality standards.

4.1 Quality of LL implementation

For a smooth implementation of SPINE Lead and Twinning Living Labs (LLs) activities as indicated in detail in the LLs Inception Report D1.1, the SPINE's Quality Assurance plan entails two fundamental pillars, I) QA for LLs implementation as an operational road map and, II) QA for the developed digital solutions and tools as a technical road map.

4.1.1 LLs roll-out plan

The operational procedure and the responsibilities of the Consortium Bodies for the Quality Assurance and Quality Management in the SPINE's LLs have been explained in the following table.

Table 6. SPINE LLs quality assurance plan

Partner	Responsibility and activities regarding LLs quality management
Project Coordinator	PC is responsible for the technical coordination of LLs roll-out and monitors the overall progress of work in SPINE Lead and Twinning Living Labs (LLs) in collaboration with Task 2.1 and Task 4.1 leaders and Quality Manager.
Work Package leaders	Ensure the timely and high qualitative • preparation phase for establishment of LLs in collaboration with Lead and Twinning cities • implementation plan for physical interventions concerning co-design, rapid testing and validation of digital solutions and scaling-up of the developed solutions/measures • cross-pollination LL activities for horizontal fertilization of activities, solutions and findings and agile adaption of good practices and key solutions across SPINE LLs.
Task leader	Coordinate quality control of the activities related to their task and flag issues as soon as they emerge in order to take early measures to remedy and prevent them from escalating .
Lead and twinning cities	Ensure the timely and high qualitative • preparation phase for establishment of LLs (e.g., obtaining the required permissions for testing and validation of digital solution), • implementation plan for the activities/ solutions/ measures to be piloted, implemented and demonstrated and the expected outputs • monitoring plan containing

	o time-plan of each activity/ solution/ measure (e.g., start and end date, duration and the monitoring moments (before during and after measurements) o method/s and indicators planned to be used to monitor the progress and measure the success of each activity /solution / measure in increasing the PT ridership, shifts in modal share, user acceptance.
Quality Manager	Support PC for implementing the QMP, flagging potential or spotted issues regarding the quality process and delay in delivering the activities / solutions / measures and expected outputs in line with the objectives of Task 7.2

4.2   Quality of tools/ solutions

WP3 deals with designs and development of the digital tools, platforms, applications and supporting models of SPINE and coordinates the integration of digital tools to the SPINE LLs. This important process highlights the need for tailoring digital tool attributes to the local end-users' preferences and expectations and the acceptance criteria.

4.2.1   Costumer expectations

Identifying customers' expectations from digital tools can be challenging in particular for nudging people towards more use of sustainable modes of transport. Thus, conducting market analysis can facilitate to realise the customers' (i.e., citizens, cities and mobility service providers) needs and expectations from the developed digital solutions and tools in SPINE LLs (e.g., Citizen's app, smart city platform, multimodal journey planner, MaaS planner etc.) to be taken into account in improvement of the quality of technical productions.

4.2.2   Quality control method

The quality control method is the activity used to ensure that developed tools/solutions meet the quality criteria. The SPINE quality control method includes performance test, admin visions and expectations feedback, gathering and assessing the satisfaction level of costumers (i.e., citizens and stakeholders) with the tools/solutions implemented in each LL. It will cover usability, usefulness, user-friendliness, and other important issues affecting user acceptance and experience.

Therefore, it is expected that the technical partners (i.e., digital solution developers) in close collaboration with LL cities and contributing organisations conduct satisfaction surveys, focus groups or interviews to gather information about local customers' preferences and expectations. The gathered information should be analysed by relevant task leaders to calculate each SPINE digital production's satisfaction rate and define the areas of weaknesses and strengths for the uptake.

This quality control method would represent the cross-country view over performance of digital solutions features and to understand which factors have played a dominant role in perception on

the usability and effectiveness of digital solutions /tools for shifting citizens travel pattern towards more use of PT.

5   Production of deliverables

This chapter focuses on breakdown of work in terms of Quality Assurance stages and Timeline for preparation and submission of SPINE's deliverable.

5.1   Preparation

In order to avoid too lengthy Deliverables, the objective and content of each Deliverable should be clear from the beginning. The focus must be clear and concise. Repeating content from other documents should be avoided whenever possible (use references for that) and always synthesize, summarize, and get to the point.

All SPINE partners should use the Deliverables template shared with deliverable leaders for preparing the Deliverables and sending them to the QM and PC.

All SPINE Deliverables will include a concise Executive Summary, introduction section outlining the document structure besides filling the designed **Table 1** for mapping SPINE's Grant Agreement (GA) commitments, both within the formal Deliverable and Task description, against the project's respective outputs and work performed for the smooth review process. Information about the deliverable type (e.g., R-document, Report; DEM-Demonstrator, pilot, protype; DEC-Website, patent, filing, videos, etc.; Other) and dissemination level (PU, SEN) as stated in the GA.

5.2   Review process

Each SPINE's Deliverable prior to submission to the EC portal (SYGMA) will go through the peer-review process shown in Annex A.

5.2.1   Pre-review

Each Deliverable leader should prepare a table of content (ToC) fully addressing the Deliverable's description/requirements as well as the respective task's actions presenting the items intended to be cover in deliverable one month after the formal initiation of the respective task. The deliverable leader should upload the ToC on project repository for the review and approval of the assigned peer-reviewer/s (See Annex B) by the SPINE Quality Manager.

The peer-reviewers are members of the SPINE project consortium assigned by the project QM based on their adequate knowledge of the topic covered by the Deliverable. The approval reviewer/s must not be a direct contributor to the Deliverable.

The list of assigned reviewers for each Deliverable will be available in advance to ensure proper planning and will be kept in a spreadsheet in the project's repository (MS-TEAMS) in the WP7-Project management folder (in the Deliverable folder). For the assignment of peer-reviewers, the overall workload is taken into consideration to keep balance assignment among project partners.

5.2.2   Quality review and approval

- Deliverable Quality Criteria

Since one of the most important programs of SPINE is to guarantee the quality of outputs based on the description of WP7 for the final product, we divide monitoring and control into two basic parts.

1- Format quality check

Once the first draft of a Deliverable finished, a quality check will be performed by the SPINE quality manager to ensure their compliance with the quality standards explained in section 5.1 (See Annex C).

It is the responsibility of the Deliverable leader to make sure the document is ready for starting peer review process by the corresponding date and therefore, to plan the previous writing phase (and interim draft versions) accordingly.

The review process will be tracked through the revision page of the draft document. Interim versions of the deliverable as well as the Deliverable review reports must be kept in the project repository, in the corresponding deliverable folder, to make them available to the consortium.

2- Content quality check

The peer reviewer is responsible for carefully reviewing the content of the Deliverable based on the check list (see Annex D) provided by the project QM, ensuring the Deliverable objectives are met from a scientific and technical point of view. Comments and requests should be provided in the document using Microsoft Word track-changes feature. It should be also noted that to ensure the smooth preparation and submission of SPINE Deliverables, both Deliverable owner and assigned Peer Reviewer(s) should adhere as much as possible to the proposed timeline and quality standards explained in quality review steps below. (See Annex A)

<u>Step 1</u>: 4 weeks before the official submission (i.e., deliverable due date), the **QM** will request and collect the (almost) ready to submit Deliverable from the Deliverable owner. Then distribute to the relevant Peer Reviewers requesting review feedback within a week. Also include in the communication the respective WP Leader and the PC.

<u>Step 2</u>: 4-3 weeks before official submission, the ***assigned peer reviewer(s)*** will review and comment the Deliverable, with primary focus the contractual obligations as per the Deliverable's and respective Task's descriptions as explained in table for peer-review assessment (See Annex D).

<u>Step 3</u>: 3 weeks before official submission, *the QM* will follow-up the return Peer Reviewers' feedback to the Deliverable owner. The received feedback should be enriched with quality assurance (QA) comments including proper use of deliverable's template and language. The QM should always notify the respective WP Leader and the PC about the Deliverable progress by keeping them in the communication loop.

<u>Step 4</u>: 3-2 weeks before official submission, the ***Deliverable owner*** must address Peer Reviewers' feedback and adjust Deliverable's content/structure accordingly. For comments not addressed, the Deliverable owner should provide a short-written justification, on the reasoning for not doing so.

<u>Step 5</u>: 1-2 weeks before official submission ***QM together with the respective WP Leader and PC*** must perform the final evaluation of Deliverable and provide and last fine-tuning recommendations to the Deliverable owner.

5.3   Submission

The Project Coordinator is responsible for uploading the final version of Deliverable to the associated folder of the project repository and into the participant portal (SYGMA) for submission to the EC.

The submitted Deliverable still can be revised upon request received from the Project officer. Simple modification does not need to be reviewed. In case of major revision, the Deliverable should be reviewed again before submission to the EC.

6 Risk management

The risk management entails identifying threats to the project, their associated risk and mitigation measures implemented to reduce these risks. SPINE risk management strategy involves two procedures:

- Risk Analysis, which aims at identification of specific risks and assessment of their potential importance and estimation of the level of probable failure of the solutions implementation. If a risk is assessed as acceptable, the required action(s) to address the risk and reduce its potential effects will be defined;
- Risk Management aims at planning necessary activities and/or actions to reduce the effects of risk.

Based on the risk mitigation plan and risk management strategy outlined in the GA, the risk assessment process is repeated at regular intervals during the project. By continuous monitoring, risk factors that endanger the success of the project or the quality of the results are identified and addressed.

6.1 Risk management activities

The following flowchart (Figure 5.) shows the risk management procedure in the SPINE Project. It describes the process, roles and envisaged activities in SPINE by WP leaders, project coordinator and quality manager and project steering committee.
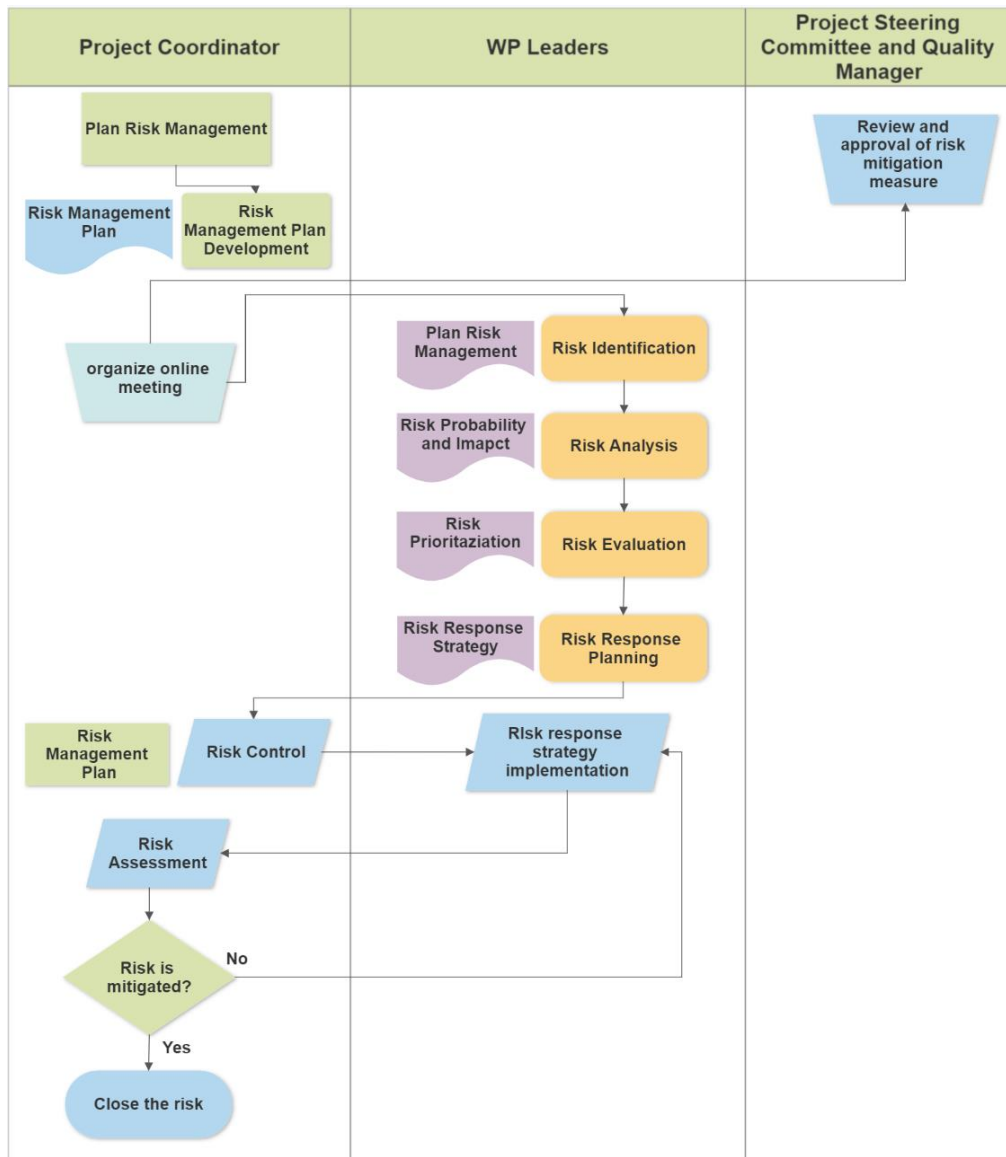
Figure 5. SPINE Risk Management Process

6.2   Risk categories

In SPINE risks will be stratified based on their impact on the project's objectives, quality of the results and solutions and time plan. The SPINE risk management plan deals with three types of uncertainties:

- **Technical risks**: all risks associated with work breakdowns in internal processes/procedures for the SPINE solutions development
- **Management risks**: all risks related to the non-technical coordination of the project (planning, budget, resources, or communication) are classified as management risks
- **Strategic Risk**: all risk associated with changes to stakeholders and customers/citizens demands or expectations or the introduction of new products or services
- **External risks:** risks that may occur due to political or regulatory changes, or any other force majeure risks that may affect the expected progress of the project.

The risk likelihood is the probability that a risk will occur in the lifetime of the project. As listed

below, three risk likelihood categories are defined in order to cope with the any unexpected problems:

1. Low: risk event not expected to occur
2. Medium: risk event may or may not occur
3. High: risk event more likely than not to occur

Risk impact is the level of severity the risk will have on the project progress if the risk is realised. The below matrix is deployed for risk impact assessment in the SPINE Project.
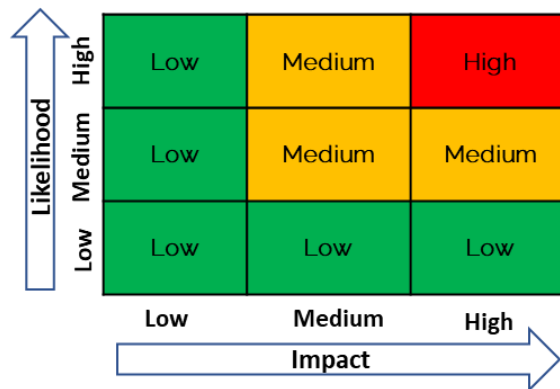
Figure 6. Risk Impact Matrix

Low impact: the effect on the project is minor.

Medium impact: the risk has a significant impact on the project progress, but it is perceived that the objectives will still be achieved. Possibly a delay would be needed.

High impact: The project's continuity would be affected, or the project's main outcomes may be altered. Usually, there would be a need for change.

6.3   Risk management action plan and tools

SPINE risk management includes early risk identification, assessment of their potential importance and estimation of the level of probable failure of the project. If a risk is assessed to be higher than acceptable, required mitigation actions to reduce its potential effects will be defined.

New risks identified will be assessed in terms of probability and impact in accordance with the above initial list of identified risks. The initial evaluation during the preparation phase of the project and in the Deliverable 1.1 "Living Labs Inception Report" identified main risks that the SPINE project may face in terms of probability and impact which have been presented in Annex E and Annex F.

During the project regular risk assessments will be conducted by the QM, PC and WP leaders. The Project Steering Team and Project Coordinator will closely monitor the risks and WP leaders will evaluate and update their likelihood. An item dedicated to risk management will be included in each project steering meeting agenda to secure that the list of potential risks is always kept up to date and mitigation actions are started in due time. Since risks are dynamic, it is also expected that new risks may appear, while some others may be discarded.

All identified and new risks are recorded in a dedicated Excel sheet, the "central risk register", which is maintained and regularly updated by the PC and QM. The risk register is available in Teams, see the channel "WP7 – Project Management/Tasks/Task 7.2".

To efficiently monitor the implementation of the solutions and actions described in D1.1 "Living Labs Inception Report", each responsible partner will be in charge of the identification of risks for envisaged solutions implementation, and by regularly monitoring them, the partners will prevent to the greatest extent possible that risks materialise into implementation barriers. Each city partner will ensure that swift and immediate action will be taken to address and solve risks as early as possible.

In order to account for potential risks when implementing the different project solutions/measures and ensure a suitable response if any aspect (s) do not go as planned, the risk owner (i.e., the SPINE partner who is responsible for reporting progress on managing the risk event) will take a proactive approach to the risk management by carrying out a preliminary analysis of potential risks.

The risk events are dynamic which their status can change over time. Therefore, it is required the status of risks events to be monitored and reported to the PC and QM for updating the 'central risk register". The status of risk could be addressed as "**under control**", "**in contingency**" (i.e., a contingency plan is under execution) or "**retired**" (i.e., it has been avoided, and it does not represent a risk anymore.

7 Conclusion

This document is SPINE Quality Handbook and Risks Registry, to be used as the "Project management manual", is a cornerstone document for professional, timely and quality implementation of the SPINE Project. based on the SPINE Grant Agreement and Consortium Agreement. The purpose of this document is to act as a common reference for all project consortium members throughout the entire project duration to enable a successful collaborative work and deliver high quality project results. This deliverable will be updated every 6 months to efficiently monitor the implementation of the solutions and actions described in D1.1 "Living Labs Inception Report" and cope with new identified Risks during the execution of the project.

8 Annexes

Annex A. QA Stages & Timeline

. QA Stages & Timeline		Description	Owner
Stage 1 (**ToC**)	1 months after the formal initiation of the respective task	Definition of the Deliverable's Table of Contents, fully addressing the Deliverable's description/requirements as well as the respective task's actions.	Deliverable Owner
	1-2 months after the formal initiation of the respective task	Organize a short (30min) Deliverable's ToC Review with the Coordinator, the respective WP Leader, and the relevant Peer Reviewer(s).	Quality Assurance Manager
Stage 2 (**Peer Review**)	4 weeks before official submission	Request and collect the (almost) ready to submit Deliverable from the Deliverable owner. Then distribute to the relevant Peer Reviewers requesting review feedback within a week. Also include in the communication the respective WP Leader and the Coordinator.	Quality Assurance Manager
	4-3 weeks before official submission	Review and comment the Deliverable, with primary focus the contractual obligations as per the Deliverable's and respective Task's Descriptions.	Peer Reviewer(s)
	3 weeks before official submission	Follow-up the return Peer Reviewers' feedback to the Deliverable owner. Enrich feedback with own (QA's) comments (including proper use of deliverable's template and language). Include the WP Leader and the Coordinator in the communication.	Quality Assurance Manager
	3-2 weeks before official submission	Address Peer Reviewers' feedback and adjust Deliverable's content/structure accordingly. For comments not addressed, provide a short-written justification, on the reasoning for not doing so.	Deliverable Owner
	1-2 weeks before official submission	Perform the final Deliverable evaluation and provide and last fine-tuning recommendations to the Deliverable Owner.	Quality Assurance Manager WP Leader Coordinator
Stage 3 (**Submission**)	Deliverable due date	When approved by the QA Manager and the WP leader, the Project Coordinator submits the final PDF version to the EU Portal	Coordinator

Annex B. List of assigned peer-reviewers for the SPINE's deliverables

#	Deliverable name	Lead Beneficiary	Type	Dissemination Level	Due Month	Due Date	Peer-Reviewer/s
				Year 1			
D1.1	SPINE Living Labs Inception Report	HU	R	PU	6	30-Jun-23	IST-ID, YUNEX, EURNEX
D5.1	Dissemination and Exploitation Plan	PNO	R	SEN	6	30-Jun-23	CIVI
D7.1	SPINE Quality Handbook and Risks Registry	UNIZA	R	PU	6	30-Jun-23	INLE
D7.2	SPINE Data Management Plan Version 1	MOBY	DMP	PU	6	30-Jun-23	KNT
D7.3	Ethics Reports	MOBY	OTHER	PU	6	30-Jun-23	UAGEAN
D1.2	SPINE Framework for Innovative PT solutions	UAEGEAN	R	PU	9	30-Sep-23	UG, INSY
				Year 2			
D2.1	LLs Report and Legacy Version 1	ANTW	R	PU	15	31-Mar-24	CARNET, IST-ID
D2.3	Antwerp LL and Implementation Version 1	ANTW	R	PU	18	30-Jun-24	CMO, CARNET
D2.5	Bologna LL and Implementation Version 1	COBO	R	PU	18	30-Jun-24	UG, ODRAZ
D2.7	Tallin LL and Implementation Version 1	TALL	R	PU	18	30-Jun-24	UAGEAN, CIVI
D2.9	Las Palmas LL and Implementation Version 1	PALM	R	PU	18	30-Jun-24	IST-ID, CARNET
D3.1	SPINE DTs and Dataspace Version 1	INLE	OTHER	PU	18	30-Jun-24	IBI, MOBY
D3.4	SPINE Smart City Platform and digital impact assessment models	IBI	OTHER	PU	18	30-Jun-24	INSY, ATOM
D5.2	Communication KIT and activities	PNO	DEC	PU	18	30-Jun-24	EIP, ODRAZ
D5.5	Exploitation plan Version 1	EIP	R	SEN	18	30-Jun-24	CIVI, PNO

D7.4	SPINE Data Management Plan Version 2	MOBY	DMP	PU	18	30-Jun-24	KNT
End of the 1st Reporting Period							
D3.3	Citizen Mobility App	MOBY	OTHER	PU	24	31-Dec-24	IBI, UAGEAN
D4.3	Twinning LLs Activities Version 1	IST-ID	R	PU	24	31-Dec-24	UA, ANTW
Year 3							
D2.2	LLs Report and Legacy Final Version	ANTW	R	PU	36	31-Dec-25	CARNET, IST-ID
D2.4	Antwerp LL and Implementation Final Version	ANTW	DEM	PU	36	31-Dec-25	CMO, CARNET
D2.6	Bologna LL and Implementation Final Version	COBO	DEM	PU	36	31-Dec-25	UG, ODRAZ
D2.8	Tallin LL and Implementation Final Version	TALL	DEM	PU	36	31-Dec-25	UAGEAN, CIVI
D2.10	Las Palmas LL and Implementation Final Version	PALM	DEM	PU	36	31-Dec-25	IST-ID, CARNET
D3.2	SPINE DTs and Dataspace Final Version	INLE	OTHER	PU	36	31-Dec-25	IBI, MOBY
D3.5	SPINE Smart City Platform Final Version	IBI	OTHER	PU	36	31-Dec-25	INSY, EURNEX
D4.1	Twining Activities report and Legacy Version 1	HU	R	PU	30	30-Jun-25	UA, ANTW
D5.3	Interim report on Communication and Dissemination activities	PNO	DEC	PU	36	31-Dec-25	EIP, HU
D7.5	SPINE Data Management Plan Version 3	MOBY	DMP	PU	36	31-Dec-25	KNT, YUNEX
Year 4							
D1.3	SPINE Consolidated Impact Assessment Report	UAEGEAN	R	PU	48	31-Dec-26	CMO, EURNEX
D4.2	Twining Activities report and Legacy Final Version	HU	R	PU	42	30-Jun-26	UA, ANTW
D4.4	Twinning LLs Activities Final Version	IST-ID	DEM	PU	42	30-Jun-26	UG, UA
D5.4	Final report on Communication and Dissemination activities	PNO	DEC	PU	48	31-Dec-26	EIP, ODRAZ

D5.6	Final Exploitation Plan	EIP	R	SEN	48	31-Dec-26	CIVI, PNO
D5.7	Training courses	UNIZA	DEC	PU	46	31-Oct-26	HU, IST-ID
D6.1	Roadmap to Unleashing the true potential of Public Transport	CMO	R	PU	48	31-Dec-26	UA, UG, EIP
D7.6	Final SPINE Data Management Plan	MOBY	DMP	PU	48	31-Dec-26	KNT, YUNEX

Annex C. QA checklist for deliverables

Deliverable content	Issues to be addressed	Assessment	Comments	Recommendations
Compliance and consistency with the SPINE GA and related task description	*Is the content of the deliverable in accordance with the related task description as specified in the GA?*	☐ Yes ☐ No ☐ Partially		
Compliance and coherence with the specific objectives of the WPs	*Does the content of the deliverable comply with the WP objectives as specified in the WP description?*	☐ Yes ☐ No ☐ Partially		
Deliverable style and format	**Issues to be addressed**	**Assessment**	**Comments**	**Recommendations**
Compliance with the deliverables format	*Does the deliverable use the SPINE deliverable template and visual identity?*	☐ Yes ☐ No ☐ Partially		
Clarity of written language	*Is the deliverable clear and easily understandable by the target audience?*	☐ Yes ☐ No ☐ Partially		
Adequacy of written language	*Level of written English*	☐ Excellent ☐ Adequate ☐ Not adequate		
Overall assessment and suggestions for improvement				
Date of Quality Assurance performed				
Deadline for submission of amended version of the Deliverable				

Annex D. Peer-review assessment template

PROJECT's Peer Review Sheet for Deliverables			

			Score Values	
Deliverable Number			OK, perhaps some minor comments	🟢
Deliverable Name			Is of reasonable quality, needs some re-work	🟠
Version			Needs substantial rework or additional work	🔴
Review result				

	Name	Organisation	Email	Phone
Deliverable Author				
Reviewer				

Content						
#	Criteria	Explanation	Score	Explanation of Score by Reviewer	Suggested improvements	Response from Author/Writer
1	Main objective of the deliverable	Does it set out to do what it says in DOW? Are objectives clearly and simply stated and in line with the Description of Work (description of the Task). Further is it clear how these objectives are relevent to the overall targeted results of the project as a whole.				
2	References and building on previous work	Have they overlooked any state of the art, previous work, related projects, regulations or best practices Does the report include and make use of relevant and necessary references?				
3	Methodology	Was the work, development, trial, experiment or study conducted in a sensible way? Are the Methods/procedures appropriate and correct?				
4	Conformance of Results	Did the deliverable do what was promised? Is the aim of the deliverable achieved? Do the findings and results of the work match the objectives as described in the Description of Work and are these results clearly described in the deliverable.				
5	Usefullness of results	Is the deliverable (and associated results) actually useful to downstream tasks or customers. Is it clear that the results are useful and relevent? Is it clear how results can be accessed Are plans realistic and actionable? Is it clear that they are not committing downsteam tasks to something impossible. For example KPI targets which cannot be reached or measured.				
6	Conclusion	Is there a conclusion chapter and does it make sense? The conclusion chapter reflects all described main important issues in the report. The conclusions are well based, relevant and applicable.				
7	Plagarism	There is no plagarism and previous work or work of others is clearly identified as such.				
Presentation, Structure and readability						
#	Criteria	Explaination	Score	Explaination of Score by Reviewer	Suggested improvements	Response from Author/Writer
Readability						
8	Readability	Can you understand it easily? Is the document easy to read and understandable.				
9	Language	Are there any obvious spelling or grammar mistakes? Is the English in the deliverable good? Is the writing style clear, consise and accessible?				
Structure						
10	Consistency with Description of work	Can the reader easily tell (e.g. by looking at the table of contents) where in the document each point in the DOW is addressed? Is it clear that the deliverable reflects the description of work?				
11	Structure	Is the structure of the deliverable logical and easy to follow? If you feel it is not, please suggest changes to the structure to make it more accessible.				
Conformance to template						
12	Template	Is the document template properly applied?				
13	Graphics	Are figures and tables legible and referred to in the text?				
14	Length	Is deliverable less than 100 pages in total?				
15	Referencing	Are the papers and other sources correctly cited and referenced?				
16	Terms	Are terms defined in the glossary? Unusual technical terms and acronyms should be added to the glossary. Ideally they should also defined in text the first time they are used unless this reduces readability or they are well known.				
17	Nomenclature	Are mathematical symbols defined?				
Overall conclusion						
#	Criteria	Explaination	Score	Explaination of Score by Reviewer	Suggested improvements	Response from Author/Writer
18	Quality	Green - The deliverable can be submitted as is but could be improved if the issues raised are addressed. Amber - The issues raised must be addressed before submission. Red - There are substantive issues with the deliverable they need to be addressed and it will require a second review.				
Write general remarks/comments and conclusions						

Annex E. SPINE's preliminary risk register and mitigation plan

#	WP	Description of risk	Probability	Impact	Proposed mitigation measures	Owner	Status
1	WP2	Stakeholder heterogeneity and difficulty of convergence in LLs	M	M-H	A certain level of heterogeneity is expected and by design reinforces the co-creative capability of the LL. Roleplaying, digital storytelling etc. will help shift perspective and focus on results	ANTW	Inactive
2	WP2, WP4	Difficulties in implementing solutions	M-H	H	Specific sub-tasks undertake the effort for the implementation. Consortium has been drafted with all necessary partners onboard. Additional budget has been specified for open calls.	INLE	Inactive
3	WP4	Local resistance in transferring solutions in twinning cities	M	M	LLs in twinning cities include a wide array of local participants and citizens to support the successful tailoring of solutions in local context	HU	Inactive
4	WP2, WP4	"Infertile" LL iterations	L	M	Multiple methods and significant experience of partners minimize the risk of infertile iterations	ANTW, HU	Inactive
5	WP3	Insufficiency of available data to implement digital solutions	L-M	L-M	Cities report available secondary data during the first 3 months of the project. Additional secondary data sources (online,	All services providers	Inactive

					social media, historical) will be mined in WP1.		
6	WP3	Inability to converge and coordinate technical developments - islands	L-M	M	Specific tasks in WP2 and WP4 oversee the transfer of knowledge. Horizontally (T5.2) but also from lead to twinning. Specific data flows and integration are described in WPs	AIM	Inactive
7	WP3, WP7	Data security and privacy risks	L	M	Task T7.4 will monitor data security and privacy risks. LL participants will provide informed consent for their participation	AIM, MOBY	Inactive
8	WP7	Inability of partner(s) to commit the required resources	L-M	M	All partners have extended experience, previous successful collaboration and are fully committed towards the goals of SPINE.	INLE	Inactive
9	WP7	Partner drop-out	L	M	Such risk is covered by the CA and the consortium is capable of replacing technical or local partners.	INLE	Inactive
10	Wp2, WP4	LL participants unhappy with results	M	H	Important actions in LL iterations include the testing of solutions by reviewing the digital and physical impact indicators. Unhappy results are still important findings and will be reported in D6.1 and LL specific deliverables	ANTW, HU	Inactive

11	WP1, WP2 WP3, WP4 WP5, WP6, WP7	Significant delays disrupting the LL process and risking the implementation	M	H	Local partners are informed and engaged. 4 years proposed timeline leaves space for setting-up operating and implementing solutions in 11 cities. Alternative methods, including the transfer of LLs in fully digital spaces and the minimization of human participation in implementations are foreseen in cases of an event majeure	ALL local partne rs	Inactive
12	WP5	Impact indicators not reached during LLs implementation	M	M-H	SPINE aspires to the successful implementation of qualified solutions and towards reaching the set impact indicators. All process along with barriers and drivers are documented for future research	EIB	Inactive

Annex F: SPINE's risk register and mitigation plan for LLs activities

#	City name	Description of risk	Probability of occurring	Proposed mitigation measure	Owner	status
1	**Barreiro**	Risk of inability to convince citizens to trial and use the new Citizen app associated with the solution "Citizen App".	High	TCB Citizen app will be connected to the existing Aqui Barreiro app, by the inclusion of links and dissemination activities.	CM Barreiro, technical partners	Active
2	**Barreiro**	Risk of accessing unauthorized user information associated with solution: "MAAS Journey Planner Platform"	High	Compliance with data protection legislation and respect for citizens' privacy rights must be ensured. Only GDPR-compliant solutions will be selected. Responsibility for the sensitive data during and after the project's completion will be clearly defined,	CM Barreiro	Active
3	**Barreiro**	Risk of failure to provide real-time information associated with solution "Bus Passengers Analytics"	Low	A decentralized approach to reduce technological infrastructure costs and risk of failure in providing real time information will be taken. This approach also implies a larger selection of cameras available so a more cost-effective solution can be selected.	CM Barreiro	Active
4	**Barreiro**	Potential risks associated with the implementation of "Smart Park & Ride management": 1) technological risk connected with operation of the parking sensors	1) Low 2) Medium	Mitigation measures are: 1) Careful choice of technology to be applied. 2) Conducting a general mobility survey with a	1) CM Barreiro 2) CM Barreiro, TCB, IST ID	Active

		2) Difficulty to identify a new P&R location that will increase local PT demand		focus on the P&R new solution to identify the most beneficial location.		
5	**Bologna**	Risk that the necessary approvals and procurements will be delayed due to the need to follow procedures and obtain relevant permissions associated with solution "Multimodal Hubs"	Medium	The solution builds on an established plan that has been supported by the participative process of the SUMP and has the necessary political support as well as clear guidelines for implementation.	City of Bologna	Active
6	**Bologna**	Potential risks associated with the implementation of "Installing EV charging stations ": 1) The risk of not meeting the timing of the implementation of the Multimodal Hubs as the EV charging stations will be integrated into these structures. 2) Queues and long waiting periods at EV chargers.	1) Low 2) Medium	Mitigation measures are: 1) The EV charging stations can be acquired fairly quickly, whereas their permitting and installation will be coordinated with the implementation of the 2 multimodal mobility hubs and the physical structures involved (parking/charging area, access lane, other structures at the Hub). 2) Provision of real-time information on occupancy and charging time of EV charging stations via the Citizen App and collection of relevant data to feed the Smart City Platform.	1) City of Bologna 2) Technical partners	Active

| 7 | **Bologna** | Potential risks associated with the implementation of "MaaS Planner application":

1) Operators are not interested in the MaaS platform or to join it.
2) Reluctance of operators to offer access to their real-time data.
3) Difficulty in involving citizens.
4) Lack of interest of citizens in changing their mobility habits. | 1) Medium
2) Medium
3) Medium
4) High | Early mitigation measures include an awareness and sensitization effort and communications to help convince citizens of the value of the initiative, beginning with street level campaigns and involving schools, companies (with and without mobility managers), public services and public transport operators. Regarding the mobility managers in the territory, they will be a key target for involvement in the LL and in understanding the needs of their reference stakeholders. | City of Bologna | Active |
| 8 | **Bologna** | Having access to adequate theoretical and real time data concerning access to the LEZ in order to generate the basis for an effective congestion charge associated with solution "Low emission zone (LEZ) congestion charging and City 30 km/h scheme/system" | Medium | Early mitigation measures include an awareness and sensitization effort and communications to help convince citizens of the value of the initiative, beginning with street level campaigns and involving schools, companies (with and without mobility managers), public services and public transport operators. Regarding the mobility managers in the territory, they will be a key target for involvement in the LL and in understanding the needs of their reference stakeholders. | City of Bologna | Active |

9	**Bologna**	Having enough people to test the LEZ system associated with solution "Low emission zone (LEZ) congestion charging and City 30 km/h scheme/system"	Low	Early mitigation measures include an awareness and sensitization effort and communications to help convince citizens of the value of the initiative, beginning with street level campaigns and involving schools, companies (with and without mobility managers), public services and public transport operators. Regarding the mobility managers in the territory, they will be a key target for involvement in the LL and in understanding the needs of their reference stakeholders.	City of Bologna	Active
10	**Bologna**	Establishing a successful mode of collection of congestion charge from residents and non-residents (which car owners to charge and how to charge them, what other types of vehicles would be charged—commercial vehicles, delivery vehicles, commuters, visitors from other Italian regions and foreign countries, etc.). This risk is associated with solution "Low emission zone (LEZ) congestion charging and City 30 km/h scheme/system".	Medium	Organizing awareness raising campaigns and Pop-up exhibition	City of Bologna	Active
11	**Bologna**	Opposition to the installation of cameras, monitoring of driving behaviours, privacy of drivers associated with solution "Low emission	Medium	Organizing awareness raising campaigns and Pop-up exhibition	City of Bologna	Active

		zone (LEZ) congestion charging and City 30 km/h scheme/system"				
12	**Bologna**	Resistance to behavior change associated with solution "Low emission zone (LEZ) congestion charging and City 30 km/h scheme/system": 1) Drivers (including bus drivers of PT) not respecting the 30 km speed limit, thus requiring additional investments in traffic-calming interventions (speed bumps, traffic islands and peninsulas, more evident street markings) and traffic speed enforcement (spot checks by local police, fines for speeding). 2) residents continuing to drive older polluting cars, rather than shift to PT, active mobility or cleaner vehicles for a variety of reasons.	High	To encourage behavior change, the visual signage of the City30 area will be improved by deploying frequent reminders (and repainting faded horizontal markings) as well as introducing more visually engaging signage, even mobilizing street artists to paint vivid and engaging reminders in certain streets near schools, health facilities, public offices or areas with intense pedestrian and bicycle traffic.	City of Bologna	Active
13	**Bologna**	Potential risks associated with the implementation of "Smart City Platform": 1) Data access risks: The Smart City Platform will require access to a variety of data sources. There is a risk that data sources may not be available or may be subject to restrictions. 2) Data quality risks: The Smart City Platform will rely on data from datacenter referring to multiple sources, such as traffic sensors, public transit systems, and weather data providers. If the data quality is poor, it could impact the accuracy of	1) Medium 2) Low 3) Medium 4) Medium	Mitigation measures are: 1) City of Bologna and SRM shall be responsible to ensure access to the required local data sources either from public or private parties. 2) To establish data quality standards and perform regular data audits by City of Bologna, SRM and technical related partners. 3) The City of Bologna and SRM ensure that the provided data are all in compliance with	1) City of Bologna, SRM 2) City of Bologna, SRM, technical partners 3) City of Bologna, SRM 4) City of Bologna	Active

		the KPIs and the overall effectiveness of the platform. 3) Regulatory risks: The deployment of the Smart City Platform may be subject to various regulatory requirements, such as GDPR compliance or local data protection laws. 4) Political risks: The deployment of the Smart City Platform may be impacted by political factors, such as changes in government or shifts in public opinion.		relevant local regulations and data protection laws. 4) It is important to ensure that the project has appropriate support from relevant stakeholders and that a clear communication plan is in place.		
14	**Bologna**	Based on the experience of the URBANE project different barriers have been identified such as parcels security issues, responsibility sharing issues. These risks are associated with solution "Cargo Hitching— Logistics scheme".	High	Results of the URBANE testing have to be evaluated before a planning of cargo hitching possible solutions in a real-life context could be carried on.	City of Bologna	Active
15	**Gdynia**	Technological risk connected with operation of the parking sensors associated with solution "Smart parking management".	Low	Mitigation of the risk is based on the careful choice of technology to be applied.	City of Gdynia	Active
16	**Šibenik**	Potential risks associated with the implementation of "Mobility as a service ": 1) Open call for transport operator is considered to be high risk because of the procurement law. 2) Technological risk connected with unification of technical systems of different operators.	1) High 2) High 3) Low	Mitigation measures are: 1) Consulting with the relevant authorities before preparation of open call 2) City will collaborate with technical partners to provide all required information of technical infrastructure of operators	1) City of Šibenik 2) Technical partners 3) City of Šibenik, technical partners	Active

		3) Compatibility of Maas and Citizen apps, which would make it difficult for citizens to be interested in using these applications.		3) Planning the compatibility of these two applications in detail.		
17	**Šibenik**	Low usage of EV charging Station and risk of vandalism associated with solution "Electrical vehicle charging stations".	Low	Careful planning locations of EV charging stations equipped with surveillance monitoring	City of Šibenik	Active
18	**Šibenik**	Potential risks associated with the implementation of "Multimodal hub ": 1) behavioral changes of users from traditional private car use to switching onto public transportation, bike sharing or walking 2) lack of bicycle lanes, insufficient cycling culture, electric bikes maintenance and repair services issues 3) most of PT users are senior citizens with lack of IT skills regarding to smartphone or app usage	Low-Medium	Mitigation of these risks is based on promoting multimodal hub as a new service and motivating people to use public transportation and mobile application, encouraging them to use electric bikes by offering incentives like loyalty programs, or rewards, special offers and discounts in collaboration with local businesses, promoting the use of public transport as a way of greenhouse gas emissions reduction and promoting e-bikes as environmentally friendly transportation option.	City of Šibenik	Active
19	**Valladolid**	Technical risk associated with "traffic management" solution implementation	Low	Mitigation of the risk is based on careful choice of technology to be applied to ensure an integration with all the solutions or platforms with focus on this solution.	City of Valladolid	Active

20	**Valladolid**	Risk associated with "Citizens App" solution implementation 1) Low interest for using the App 2) technical issues for App functionality	Low	Mitigation measures are 1) A market analysis will be conducted to understand users and stakeholders' needs. 2) City of Valladolid will gather in regular basis users' feedback on Multimodal Journey Planner's technical bugs and satisfaction rate regarding usability and will inform technical partners for coping with them	City of Valladolid	Active
21	**Valladolid**	Risk associated with "Smart parking management" solution implementation		Collection of parking users' experience, level of satisfaction and the add-value of proposed parking scheme	City of Valladolid, technical partners	Active
22	**Valladolid**	Risks associated with "Multimodal hub" solution implementation include getting a behavioral change of delivery companies to involve with this new service. Other important risk is related with the technology to achieve an agile and user-friendly application that does not interrupt the work of professionals.	Medium	Mitigation of the risk is based on ensuring the use of a good application for the services and on motivating and promoting the new services between the actors involved.	City of Valladolid, technical partners	Active
23	**Valladolid**	Risk associated with "On-demand mobility service" solution implementation lies in building a reliable system that allows a good planning of the routes in public transport	Medium	Mitigation of the risk is based on ensuring the use of the proper digital tools.	City of Valladolid, technical partners	Active
24	**Žilina**	The risk of implementation of "Real-time information for PT passengers" solution lies in possible technical	Low	Mitigation of the risk is based on negotiations with the authorities responsible for the	City of Žilina	Active

		obstacles and possibly in the refusal of partners on the side of the objects where the screens are to be placed.		objects, in which the screens are to be placed and in mutual search of a suitable solution.		
25	**Žilina**	The risk of implementation of "Multimodal Journey Planner" solution lies in technical obstacles.	Medium	City of Žilina will gather in regular basis users' feedback on Multimodal Journey Planner's technical bugs and satisfaction rate regarding usability and will inform technical partners for coping with them	City of Žilina	Active
26	**Žilina**	The risk of implementation of "Smart parking management lies in technical obstacles		Technical risks can be mitigated by careful preparation of a public procurement, especially by precisely specifying technical parameters. To mitigate the second mentioned risk, an evaluation of the solution will be introduced since an early stage and additional motivational tools to support PT instead of using a car will be considered.	City of Žilina	Active
27	**Žilina**	Potential risks associated with the implementation of "SMART city platform for transport and mobility planning " 1) Data access risks: The Smart City Platform will require access to a variety of data sources. There is a risk that data sources may not be available or may be subject to restrictions.	Medium-High	Mitigation measures are: 1) the city of Žilina shall be responsible for ensuring access to the required local data sources either from public or from private parties. 2) Establish data quality standards and perform regular data audits by both City of	City of Žilina	Active

		2) Data quality risks: The Smart City Platform will rely on data from datacenter referring to multiple sources, such as traffic sensors, public transit systems, and weather data providers. If the data quality is poor, it could impact the accuracy of the KPIs and the overall effectiveness of the platform. 3) Regulatory risks: The deployment of the Smart City Platform may be subject to various regulatory requirements, such as GDPR compliance or local data protection laws. 4) Political risks: The deployment of the Smart City Platform may be impacted by political factors, such as changes in government or shifts in public opinion.		Žilina and technical related partners. 3) The City of Žilina ensure that the provided data are all in compliance with relevant local regulations and data protection laws; and 4) To ensure that the project has appropriate support from relevant stakeholders and that a clear communication plan is in place		
28	**Žilina**	Potential technical risks associated with the implementation of "Dashboard for real-time traffic data" are: 1) Data access risk: The raw data from automated vehicle counters installed at the approaches are currently not available to the City of Zilina. 2) Data integration risk	Low-Medium	Mitigation measures: 1) In collaboration with UNIZA as one of the CleverNet project partners, the city will seek an agreement with other relevant CleverNet project partners to get access to the sensor data. 2) YUNEX and KNT will support City of Zilina for preparing the infrastructure and required format for data integration and	City of Žilina, KNT and YUNEX Traffic	Active
29	**Žilina**	Setting up Žilina living lab and making it operational	Medium	UNIZA as a researcher partner will strongly support the development	City of Žilina, UNIZA	Active

				process to undertake the role as an intermediate organizer and facilitator with competencies in user involvement methods, design processes.		
30	**Žilina**	Low interest for Open-dialogue digital hub aiming at the engagement of local communities in the co-design of solutions addressing diverse user needs	Medium	Adequate communication management for the digital hub. Subsequent adjustment of the communication strategy in order to mobilize missing representatives.	City of Žilina	Active
31	**Rouen**	Potential risks associated with the implementation of "Integration of on-site parking in the MaaS of Rouen": 1) Having the theoretical and real-time data of the availability of the parking 2) Having the data of payments in the parking 3) Having the theoretical and real time data of the equipment (EV charging car space, disability car space) of the parking. 4) Having enough people to test the system	Medium	For data availability: 1) Cityway, in communication with the Municipality of Rouen, will be responsible for ensuring access to the required local data sources. 2) Early discussion on data exchange with all parties involved. 3) Establish a communication channel with the data provider (regular calls for example) 4) Clearly identify the sources of data to be retrieved and establish early communication channels. 5) Determine appropriate methods for data collection for consistency and minimum error.	Cityway	Active

				6) Request early sample data to determine format, accuracy, and reliability. Stakeholder engagement: 1) Communication campaigns to help convince citizens of the value of the initiative. 2) Regular communication to keep stakeholders engaged and informed throughout SPINE lifecycle. 3) Implement feedback mechanisms (surveys, focus groups) to gather opinions.		
32	**Rouen**	Potential risks associated with the implementation of "Integration of Low Emission Zone (LEZ) in the journey planner of the MaaS of Rouen": 1) Having the theoretical and real time data of the availability of the LEZ or congestion 2) Having enough people to test the system	Low	For data availability: 1) Cityway, in communication with the Municipality of Rouen, will be responsible for ensuring access to the required local data sources. 2) Early discussion on data exchange with all parties involved. 3) Clearly identify the sources of data to be retrieved and establish early communication channels. 4) Determine appropriate methods for data collection for consistency and minimum error.	Cityway	Active

				5) Request early sample data to determine format, accuracy, and reliability. Stakeholder engagement: 1) Communication campaigns to help convince citizens of the value of the initiative.		
33	**Rouen**	Potential risk associated with the implementation of "Extend the integration of carpooling in the MaaS of Rouen" lies in having the data from the carpooling company on proposed journeys by carpooling users	Medium	For data availability: 1) Cityway, in communication with the Municipality of Rouen, will be responsible for ensuring access to the required local data sources. 2) Early discussion on data exchange with all parties involved. 3) Clearly identify the sources of data to be retrieved and establish early communication channels. 4) Determine appropriate methods for data collection for consistency and minimum error. 5) Request early sample data to determine format, accuracy, and reliability. Stakeholder engagement: 1) Communication campaigns to help convince citizens of	Cityway	Active

				the value of the initiative. 2) Regular communication to keep stakeholders engaged and informed throughout SPINE lifecycle. 3) Implement feedback mechanisms (surveys, focus groups) to gather opinions.		
34	**Rouen**	Potential risk associated with the implementation of "Full integration of ToD n the MaaS application" lies in having the data from the TOD company on proposed journeys by TOD users	Medium	1) Cityway in communication with the Municipality of Rouen, will be responsible for ensuring access to the required local data sources. 2) Early discussion on data exchange with all parties involved. 3) Establish a communication channel with the data provider (regular calls for example) 4) Clearly identify the sources of data to be retrieved and establish early communication channels. 5) Determine appropriate methods for data collection for consistency and minimum error. 6) Request early sample data to determine format, accuracy, and reliability.	Cityway	Active

				Stakeholder engagement:		
				1) Communication campaigns to help convince citizens of the value of the initiative.		
				2) Regular communication to keep stakeholders engaged and informed throughout SPINE lifecycle.		
				3) Implement feedback mechanisms (surveys, focus groups) to gather opinions		
35	**Tallinn**	Potential risks associated with the implementation of "SMART city platform "

1) Data access risks: The Smart City Platform will require access to a variety of data sources. There is a risk that data sources may not be available or may be subject to restrictions.

2) Data quality risks: The Smart City Platform will rely on data from datacenter referring to multiple sources, such as traffic sensors, public transit systems, and weather data providers. If the data quality is poor, it could impact the accuracy of the KPIs and the overall effectiveness of the platform.

3) Regulatory risks: The deployment of the Smart City Platform may be subject to various regulatory requirements, | Medium-High | Mitigation measures are:

1) the City of Tallin shall be responsible to ensure access to the required local data sources either from public or private parties.
2) to establish data quality standards and perform regular data audits by both City of Tallin and technical related partners.
3) the City of Tallin shall ensure that the provided data are all in compliance with relevant local regulations and data protection laws.
4) to ensure that the project has appropriate support from | City of Tallinn | Active |

		such as GDPR compliance or local data protection laws. 4) Political risks: The deployment of the Smart City Platform may be impacted by political factors, such as changes in government or shifts in public opinion.		relevant stakeholders and that a clear communication plan is in place.		
36	**Antwerp**	Difficulty to collect/access data for evaluation from external parties	Medium	Early discussion on data exchange with all parties involved. Find KPIs with a low dependency on data from external parties.	City of Antwerp	Active
37	**Antwerp**	Difference in vision/approach between municipality, FUA, regional government and federal government.	Low	Keeping an open dialogue and design everything as flexible and interoperable as possible.	City of Antwerp	Active
38	**Antwerp**	Low or no impact on quality of service provided by both PT operators (De Lijn = Flemish Region; NMBS = Federal).	Low	Keeping (political) pressure high on all levels to improve services levels of PT	City of Antwerp	Active
39	**Antwerp**	Difficulty to find the right display technology that matches the digital requirements and fits withing the design constrains of street furniture in Antwerp as well as the limited access to energy sources	Medium	Preparation of proposals for redesign of existing street furniture and make clear other benefits of the redesign	City of Antwerp	Active
40	**Antwerp**	2024 City Elections	Medium	Solidify various measures and investments as early as possible	City of Antwerp	Active
41	**Heraklion**	Technical complexity and commitment of involved actors for the integration of existing Bike Sharing apps	Medium	Establish standardized data formats, develop comprehensive documentation for the APIs and maintain	City of Heraklion	Active

				continuous communication		
42	**Heraklion**	Difficulty to ensure wider applicability and adoption of cargo hitching (along with implementing a supporting IT solution)	Medium	Collaborate with key stakeholders and establish potential partnerships, communicate for wider awareness, and collect feedback to improve	KTEL Heraklion	Active
43	**Heraklion**	Difficulty to obtain necessary licenses for the buses for the cargo hitching solution	Medium	Check relevant laws and requirements early, ensure documentation and paperwork are in order, allow enough time as obtaining licenses can be very time-consuming	KTEL Heraklion	Active
44	**Heraklion**	Bureaucratic difficulty in putting in action the "on-demand mobility service" for vulnerable users.	High	Conduct comprehensive review of the existing frameworks and implement small scale pilot program	City of Heraklion	Active
45	**Heraklion**	Municipal elections in October 2023	High	Continuous collaboration in order to minimize the impact	City of Heraklion	Active