



URBANITE

**Supporting the decision-making in urban transformation with
the use of disruptive technologies**

Technical Report

Project management final report (M25-M39)

Editor(s):	Sergio Campos, Sonia Bilbao
Responsible Partner:	TECNALIA
Status-Version:	Draft - v0.4
Date:	06.09.2023
Distribution level (CO, PU):	CO

Project Number:	GA 870338
Project Title:	URBANITE

Title of Deliverable:	Project management report (M24)
Due Date of Delivery to the EC:	30.06.2023

Workpackage responsible for the Deliverable:	WP1–Project Management
Editor(s):	Sergio Campos, Sonia Bilbao (TECNALIA)
Contributor(s):	All partners
Reviewer(s):	Maria José López
Approved by:	All Partners
Recommended/mandatory readers:	All WPs

Abstract:	Report on technical and outreach progress, as well as use of resources status with respect to plan. It includes the administrative and financial reporting of the overall project in the previous months and <i>deviations</i> , risks, problems and contingency actions, if applicable.
Keyword List:	Effort, Budget, WP report, use of resources, deviations, risks
Licensing information:	The document itself is delivered as a description for the European Commission about the work carried out, so it is not public.
Disclaimer	This document reflects only the author's views and neither Agency nor the Commission are responsible for any use that may be made of the information contained therein

Document Description

Document Revision History

Version	Date	Modifications Introduced	
		Modification Reason	Modified by
v0.1	19/05/2023	First version	TECNALIA
V0.2	02/08/2023	Integated version	TECNALIA
V0.3	22/08/2023	Integated version	TECNALIA
V0.4	05/09/2023	Integated version (draft for the PO)	TECNALIA
v1.0	30/08/2023	Final version submitted	TECNALIA

Table of Contents

Table of Contents	4
List of Figures	6
List of Tables.....	6
Terms and abbreviations.....	8
Executive Summary.....	9
1 Explanation of the work carried out by the beneficiaries and Overview of the progress..	10
1 Objectives.....	16
1 Explanation of the work carried per WP	25
1.2.1 Work Package 1 – Project Management	25
1.2.1.1 Summary of work progress and achievement during the period.....	25
1.2.1.2 Detailed Work for each task.....	25
1.2.1.3 Significant results	26
1.2.1.4 Deviation from DoA.....	27
1.2.1.5 Failure to achieve objectives.....	27
1.2.1.6 General Assembly meetings and/or conference-calls during that period.....	27
1.2.2 Work package 2 - Social impact of disruptive technologies	30
1.2.2.1 Summary of work progress and achievement during the period.....	30
1.2.2.2 Detailed Work for each task.....	32
1.2.2.3 Significant results	33
1.2.2.4 Main innovations	33
1.2.2.5 Deviation from DoA.....	33
1.2.2.6 Failure to achieve objectives.....	34
1.2.2.7 WP meetings and/or conference-calls during that period	34
1.2.2.8 Partners contributions.....	34
1.2.3 Work package 3 - Data Management Platform.....	38
1.2.3.1 Summary of work progress and achievement during the period.....	38
1.2.3.2 Detailed Work for each task.....	39
1.2.3.3 Significant results	39
1.2.3.4 Main innovations.....	40
1.2.3.5 Deviation from DoA.....	40
1.2.3.6 WP meetings and/or conference-calls during that period	40
1.2.3.7 Partners contributions.....	42
1.2.4 Work package 4 - Algorithms and simulation techniques for decision – makers (JSI)	44
1.2.4.1 Summary of work progress and achievement during the period.....	44
1.2.4.2 Detailed Work for each task.....	45

1.2.4.3	Significant results	46
1.2.4.4	Main innovations.....	46
1.2.4.5	Deviation from DoA.....	47
1.2.4.6	Failure to achieve objectives	48
1.2.4.7	WP meetings and/or conference-calls during that period	48
1.2.4.8	Partners contributions.....	49
1.2.5	Work package 5 – URBANITE ecosystem integration and DevOps	51
1.2.5.1	Summary of work progress and achievement during the period.....	51
1.2.5.2	Detailed Work for each task.....	52
1.2.5.3	Significant results	52
1.2.5.4	Deviation from DoA.....	53
1.2.5.5	Failure to achieve objectives	53
1.2.5.6	Plan for the next months.....	53
1.2.5.7	WP meetings and/or conference-calls during that period	53
1.2.5.8	Partners contributions.....	54
1.2.6	Work package 6 - Use Cases	56
1.2.6.1	Summary of work progress and achievement during the period.....	56
1.2.6.2	Detailed Work for each task.....	58
1.2.6.3	Significant results	58
1.2.6.4	Main innovations.....	59
1.2.6.5	Deviation from DoA.....	59
1.2.6.6	Failure to achieve objectives	59
1.2.6.7	Plan for the next months.....	59
1.2.6.8	WP meetings and/or conference-calls during that period	59
1.2.6.9	Partners contributions.....	60
1.2.7	Work package 7 - Sustainability and awareness	63
1.2.7.1	Summary of work progress and achievement during the period.....	63
1.2.7.2	Detailed Work for each task.....	64
1.2.7.3	Significant results	66
1.2.7.4	Deviation from DoA.....	67
1.2.7.5	Failure to achieve objectives	67
1.2.7.6	Plan for the next months.....	67
1.2.7.7	WP meetings and/or conference-calls during that period	67
1.2.7.8	Partners contributions.....	67
1.2.8	Work package 8 - Ethics requirements.....	71
1.2.8.1	Summary of work progress and achievement during the period.....	71
1.2.8.2	Detailed Work for each task.....	71

1.2.8.3	Significant results	71
1.2.8.4	Main innovations.....	71
1.2.8.5	Deviation from DoA.....	71
1.2.8.6	Failure to achieve objectives.....	71
1.2.8.7	Plan for the next months.....	71
1.2.8.8	Partners contributions.....	72
2	Updated Data Management Plan.....	72
3	Updated Ethics-related Deliverables.....	72
4	Update of the plan for exploitation and dissemination of results	73
5	Deviations from Annex 1 and Annex 2	74
5	Tasks.....	74
5	Use of resources.....	74
5.2.1	Unforeseen subcontracting (if applicable)	83
5.2.2	Unforeseen use of in kind contribution from third party against payment or free of charges (if applicable)	83
6	Risk Management Plan.....	83

List of Figures

FIGURE 1.	COMPARATIVE BETWEEN THE EFFORT SPENT WITH THE TOTAL PLANNED FOR THE WHOLE PROJECT ..	74
FIGURE 2.	PERCENT OF SPENT COST PER WP (M25-M39).....	75
FIGURE 3.	EVOLUTION OF THE EFFORT PER WORK PACKAGE ALONG THE PROJECT	75
FIGURE 4.	PERCENT OF EFFORT SPENT PER WORKPACKAGE ALONG THE PROJECT	78
FIGURE 5.	COMPARATIVE OF EFFORT SPENT AND ESTIMATED PER WORK PACKAGE ALONG THE PROJECT	78
FIGURE 1.	COMPARATIVE OF SPENT AND ESTIMATED EFFORT PER PARTNER (M1-M39).....	80
FIGURE 7.	PERCENT OF EFFORT SPENT PER PARTNER (M1-M39)	80
FIGURE 8.	EXPLANATION OF THE COSTS OF THE CONSIDERED NATURAL AND ACTUAL COSTS IN ALMA DIGIT	82
FIGURE 9.	BUDGET PER PARTNER M1-M39.....	82
FIGURE 10.	PERCENTAGE OF EU CONTRIBUTION SPENT AS OF M39	83

List of Tables

TABLE 1.	SUMMARY OF DELIVERABLES FOR THE PERIOD M25-M39	15
TABLE 2.	EXPECTED EVOLUTION OF THE PROJECT KPIS	20
TABLE 3.	STATUS OF THE KPIS FOR M39	22
TABLE 4.	SPENT EFFORT (PMS) PER PARTNER IN M25-M39.....	75
TABLE 5.	SPENT EFFORT VS. PLANNED EFFORT IN M25 – M39.....	76
TABLE 6.	SPENT EFFORT VS. PLANNED EFFORT IN M1 – M39.....	79

TABLE 7. COSTS PER PARTNER IN ALL COST CATEGORIES IN THE PERIOD M25-M3981
TABLE 8. ACCUMULATED COSTS PER PARTNER IN ALL COST CATEGORIES AT M3981
TABLE 9. PRIORITIZATION OF RISKS IN URBANITE83

Terms and abbreviations

API	Application Programming Interface
CI/CD	Continuous Integration /Continuous Deployment
DCAT-AP	Data Catalogue vocabulary
DevOps	software development (Dev) and IT operations (Ops)
DMP	Data Management Plan
DoA	Description of Action
DPO	Data Protection Officer
EC	European Commission
FLOSS	Free and Open Source Software
GDPR	General Data Protection Regulation
GUI	Graphical User Interfaces
ICT	Information and Communication Technologies
IPR	Intellectual Property Right
KR	Key Result
Mx	Month x, being x a number
NFR	Non-Functional Requirement
POPD	Privacy protection of data
SoPoLab	Social Policy Lab
UI	User Interface
WIP	Work in progress
WP	Work package

Executive Summary

This deliverable aims to present the work performed from April 2022 to June 2023, corresponding to the last reporting period of the project (M25 – M39). The document follows the template provided by the European Commission for the Technical Report.

The project has generally run on track, with some minor delays in deliverables D1.5, D1.6, D2.5, D3.6, D4.4, D4.6, D7.5 and D7.9. The project has achieved the 3 last planned milestones.

The project has already delivered the last version of the requirements and of the architecture for the URBANITE ecosystem. A third version of this ecosystem has been implemented and deployed for the URBANITE use cases and the final evaluation has been carried out with good results. Besides, the final updates on the exploitation strategy, both individual and of the consortium as a whole, based on a Alliance, are available and the planned dissemination and communication activities carried out. The recommendations and lessons learned for any public administration aiming at using similar technologies is also published.

Finally, the document presents an updated risk register with the applied contingency and mitigations plans and actuations.

1 Explanation of the work carried out by the beneficiaries and Overview of the progress

The purpose of this document is to provide a complete progress report of the tasks that were realized by the consortium in the third year of the Project (April 2022– June 2023) in order to successfully finalized URBANITE. It includes the main activities carried out to achieve the objectives, the detailed work carried out by the project's work packages, updates (when relevant) on dissemination, exploitation and data management plans and use of resources. It also includes an updated version of the risks, problems, and contingency actions.

During this third period, the project needed to successfully complete four milestones:

- MS5: Second release of the of the URBANITE ecosystem integrating the second version of URBANITE components (M27)
- MS6: Final release of the URBANITE components on the first of M37 merging contributions from WP2, WP3 and WP4 (originally planned M36).
- MS7: Final release of URBANITE ecosystem (WP5) was finished on M37 (planned for M37).
- MS8: Final implementation of the use cases (WP6), Final version of the URBANITE business models, and plans, communication and dissemination report (WP7) were achieved on mid of M40 (planned for M39)

Hence, we can conclude that the last four milestones have successfully been achieved with tangible results and deliverables, implying the proper fulfilment of the project as a whole.

The project has experienced a delay on D4.6 and minor delays in deliverables in D1.5, D1.6, D2.5, D3.6, D4.4, D7.5 and D7.9.

The **main achievements** for this period can be summarized as follows:

- The emphasis research conducted placed on the need for the use, development, and implementation of disruptive technologies to align with **public values** and the **missions of public institutions** who use them.
- Use case requirements refinement by bringing together all those involved, both technical and user, to define together the next steps and functionalities, identifying relevant stakeholders (SMEs, ONGS, etc.), including the social dimension, to engage in supporting URBANITE in different roles.
- Successful execution of the **SoPoLabs** in all pilot cities in a consistent and coordinated manner, which enabled partners to gain & share interesting insights and learn from one another.
- Built of the **Data Management Platform** which supports the end-to-end data processing chain, from collection, aggregation, provisioning to using the data.
- Integration of the **Decision-Support System** through powerful analytics tools which combine multiple data sources and cutting-edge algorithms, simulation, recommendations and visualization.
- Valuable list of **recommendations for policy makers using data-driving technologies** to inform their decision-making.
- Share outcomes with the rest of the cities in a final session at European level, in order to identify which conclusions and lessons learned from the different pilots could be replicated at European level.

WP3

- Completion of the connection of the URBANITE Data Management Platform to a set of new data sources and integration of new data models and transformations to handle these new sources.
- Addition of several new connectors, a new Data Aggregation API and an anonymization feature

WP4

- In the final year of the project, the main achievements of the WP4 are finalization of the analysis, simulation, decision support and recommendation modules.
- The mobility policy simulation module has been extended to support parametrization of simulation creation, allowing end users to create new simulation scenarios based on the predefined simulations. The predefined simulation of the scenarios, codefined with the pilot cities, have been updated with better population models and travel demand models.
- The decision support system has been updated to use the latest versions of the KPI calculating algorithms. Several bugfixes have been applied both to the decision support system and the KPIs themselves.
- The recommender system has been redesigned from the initial design and implemented. The new system is built on top of the decision support system and provides a general recommendation based on comparison of a scenario with the baseline scenario as well as specific proposals of city aspects that should be focused on in order to improve the general quality of the scenario.
- Finalization of the **analysis, simulation, decision support and recommendation data-driven modules** based on the feedback provided by the use cases. More specifically, the following modules have been refined and updated: traffic prediction, global traffic prediction, traffic OD matrix, bike trajectories, bus OD matrix, noise computation, bike OD matrix, bike data, traffic evolution, weekly traffic flows and LPT critical areas.

WP5

- **DevOps strategy** compliance throughout the integration and deployment of the **second and final prototype of the URBANITE Ecosystem**, providing the expected functionalities as well as aligning technical and development requirements with the requirements provided by the use cases.
- Support and continuous deployment and integration of technical components into the infrastructure, supporting their continuous evolution, by **complying a DevOps strategy**.
- Final URBANITE ecosystem **unified GUI**.
- Definition of the **final architecture** reflecting the evolution of the different conceptual layers covered by the Ecosystem.
- Complete guidance with user manual and instructions for the installation of the prototype on premise.

WP6

- Customised instance of the URBANITE Platform for each use case, that includes the connection to specific data sources (and related data ingestion processes), specific simulations, data analysis, and related visualisations.

- Based on selected requirements of the use cases, four storytelling of usage of the URBANITE Platform have been designed, resulting in the implementation of four custom dashboards and built leveraging the capabilities offered by the URBANITE Platform.
- Concerning the evaluation framework the questionnaire for the collection of feedback about usability, use cases satisfaction degree, and cross department interoperability were updated and further aligned to the approach of the SUS methodology.
- Four evaluation sessions have been designed, organised and held in the use cases (one evaluation session per use case) with the aim of presenting the URBANITE Platform and the functionalities implemented for each use case; establishing an open discussion with the participants; collecting feedback about the URBANITE Platform and the implemented functionalities, and; to disseminate the questionnaire for the collection of feedback.
- Collected and analysed feedback and questionnaire responses for both technical and non-technical aspects of the URBANITE platform and its functionalities, obtaining the final result of the evaluation.

WP7

- Expected KPIs achievement of dissemination material (brochures, posters, press releases, social media channels, videos, and newsletters), publications and organisation and attendance to events.
- Final event (interactive workshop+ exhibitor area) where the consortium contrasted with decision makers and technicians in Urban Mobility the real possibility of a shift paradigm (based on data and a mix of quantitative and qualitative methods) in urban mobility planning, challenges, lessons learned, and the opportunities around Open-Source Data Lakes and Data Spaces for Smart Cities.
- Final business model released ensuring the right exploitation and sustainability strategy, while providing a twofold perspective, the consortium as a whole and per each participant.
- Six partners expressed their interest towards the joint exploitation activities with a Letter of Intent for the creation of the URBANITE Alliance after the project.
-

The main **innovations** of URBANITE for this period can be summarized as follows:

WP2

- Allowing civil servants in the pilot cities and beyond to gain a deep understanding of how disruptive innovations can threaten or improve democratic governance of mobility policy and data, particularly with regard to civic participation, (social and environmental) sustainability, and shared values including openness, transparency, equality, and accountability.
- Increasing the trust of civil servants in the use of 'disruptive' technologies through opportunities to see and test the technologies and to ask how those technologies are developed. There is a high need to make technical development participatory, in order to increase mutual trust. In Urbanite, we have increased this trust through continued meeting with the formal and informal stakeholders and SoPoLabs. There have been opportunities to ask all the questions, regardless of the existing expertise and technical understanding of the stakeholders.

- Collaborative approach through SoPoLab session to start deepening in aspects of policy-making. Some cities did this in the definition and design of future policies, others in the benefits that a collaborative design of policies would bring and others in the challenges or barriers that these policies should address.

WP3

- A scalable and modular ETL pipeline for data and metadata that allows for easy configuration of new data sources and efficient data transformations
- Data Aggregation API that leverages advanced time series storage techniques to improve performance and facilitate customized retrieval of large data volumes

WP4

- A common simulation approach shared among the four pilot cities, and common evaluation framework for simulation comparisons and decision support. Even with very different use cases in the four cities and discrepancies among the data sources available we have created a joint approach to traffic simulation. The decision support system introduces a common evaluation framework while using city-specific KPIs, codesigned with the pilot cities. For each city a decision model has also been co-created that utilizes the custom KPIs to compare multiple scenarios for a city.
- Another innovation achieved is the use of machine learning to propose infrastructural changes. While this result is not implemented in any of the deployed tools and is not part of the URBANITE ecosystem it is a novel approach that could support future work in related areas.
- Incorporate use case perspective in data-driven modules such as the safety factor computation for Bike Analysis Module (by comparing the safety index computation with the actual accidents stored has been included), the development of the Global Traffic Prediction Module (enabling the accessibility of the traffic predictions results for the whole city at once), Noise Computation Module refinement (iso-surface to monitor locations where noise is computed to have the same values as well as response times improvements) and modifications on the Bike Trajectory Module (trajectories for different specific days or different types of days).

Commentato [UC11]: @JSI
is it appropriate to include this as an innovation in URBANITE?

WP5

- The principles of the DevOps approach and strategy were adopted to integrate, maintain and support the technical components into the URBANITE Ecosystem (v2 and final releases). Additionally, there was a focus on providing assistance for the specific components required within each pilot environment. This support is geared towards enabling the realisation of the envisaged functionalities, addressing the needs of the use cases, and involving them in the iterative process of requirements reformulation, refinement, development, and validation.

WP6 (ENG)

- Definition of the four use cases of the project and the relative **verticalization of the URBANITE Platform** to support the management and planning of urban mobility.
- Storytelling of the usage of the URBANITE platform for the use cases so as to facilitate common understanding.
Specific analyses, simulations, and visualisations for the use cases aiming to maximize use case involvement, acceptance, and benefit.

Consolidated evaluation framework including both technical and not technical aspect of the achieved results.

WP7

- The final exploitation strategy, licensing and business plan of the consortium for the key results (KR) of the project,

The results of this period are being completed with the submission of all the deliverables, as summarized in Table 1. There have been some delays, as explained above.

WP1

Regarding D1.5, the preliminary policy briefs are based on the results of the SoPoLab sessions, available as of when the document was planned, requiring more time for its process. On the other hand, the focus of the document was not clear, and it took time and consultation to identify the best approach to summarize the conclusions.

On the other hand, D1.6 takes as its starting point D2.6, which, as will be explained later, was delayed at the end of the project to take into account the latest work and observations with the pilots/end users. The conceptualization and design of infographics have required additional time.

WP2

The third SoPoLabs session of the different cities took place in: the 5th of July 2022 (AMS), 17th of June 2022 (BIO), 7th of June 2022 (HEL) and May 16th, 2022 (MES). The results and conclusions of all of them are integrated into the deliverable D2.5, for this reason, it was delayed a few months until the information was available and homogenized.

WP3

D3.6 was delayed by a small number of days as the internal review revealed that an additional round of editing was necessary for the level of quality desired.

WP4

The deliverable D4.4 URBANITE traffic flow model has been delayed for two months due to some technical issues with the traffic simulation module and the population model and the travel demand model. At the time we were using multiple approaches to the travel demand modelling, which caused a significant raise in complexity and therefore the time required for testing and debugging. Some of the delay was also due to issues with COVID-19.

The deliverable D4.6 Final implementation of the recommendation system for policy design has been delivered with a 10-month delay. There are several reasons for this delay. The initial design of the recommendation system has been described in deliverable D4.5. Recommendation system for policy design, and the implementation of it started with some delay due to delays on the traffic simulation module, mentioned above. Initial experiments using the genetic algorithms approach proved the approach to be too computationally expensive, even after trying several optimization techniques, such as using heuristics to search for feasible solutions and using a surrogate model to assess solution validity instead of a full simulation. These experiments required significant time to set up and run due to their complexity, also other approaches were explored. The recommendation engine design was redesigned from the ground up. The new approach builds on top of the decision support system.

Commentato [Ug2]: @TECNALIA, @JSI please add your innovatios elements related to the WP7

Commentato [UCI3]: @JSI
This deliverable was planned for M36 (last amendment) and uploaded to the EU portal in M40. It would be appropriate to reflect this in the text, reporting a 10-month delay does not reflect those changes in the amendment.

WP7

For the preparation of D7.5, which summarizes the different activities on dissemination, communication and collaboration with other projects, it was decided to include updated information on the latest opportunities and actions that took place during the project, some of them after the final event in coordination with OASC.

The deliverable D7.9 URBANITE IPR Management, Business Models and Business Plan-v3 has been delayed with a month delay. The delay in submitting the deliverable was caused by the need of additional data acquisition related to costs estimations, as well as the complexity of the scenarios simulations, which in turn resulted in a delay in analyzing and formulating the URBANITE forecasting scenarios. Another factor was the collection of the Letters of Intent by partners which required more time than expected.

Table 1. Summary of deliverables for the period M25-M39

SUMMARY OF DELIVERABLES FOR M25-M39				
Deliv. Number	Deliverable Name	Type	Month Planned	Month Submitted
D1.5	Policy Brief (Preliminary findings)	Report	M24	M29
D1.6	Policy Brief (Main findings)	Report	M39	M40
D2.5	SOPO Lab third session “Policy: translating insights into practical policy and requirements”	Other	M25	M28
D2.6	Impact analysis and recommendations	Report	M39	M39
D3.3	Data harvesting module and connectors implementation-v2	Other	M30	M30
D3.6	Data curation module implementation-v2	Other	M30	M31
D3.8	Data aggregation and storage module implementation-v2	Other	M30	M30
D4.4	URBANITE traffic flow model	Other	M24	M26
D4.6	Final implementation of the recommendation system for policy design	Other	M36	M40
D5.8	URBANITE Ecosystem-v2	Other	M27	M27
D5.9	URBANITE Ecosystem-v3	Other	M37	M37
D6.3	URBANITE use cases implementation-v2	Report	M39	M39
D6.5	URBANITE Evaluation-v2	Report	M39	M39

Commentato [BS5]: check according to amendment

Commentato [UC16R5]: Done

SUMMARY OF DELIVERABLES FOR M25-M39				
Deliv. Number	Deliverable Name	Type	Month Planned	Month Submitted
D7.5	Dissemination, communication and networking report-v3	Report	M39	M40
D7.9	URBANITE IPR Management, Business Models and Business Plan-v3	Report	M39	M40

Commentato [BS5]: check according to amendment

Commentato [UCI6R5]: Done

1 Objectives

As stated in the DoA [1], the URBANITE objective is as follows:

Provide, by means of a co-creation strategy, a **long-term sustainable** ecosystem model that articulates the **expectations, trust and attitude from civil servants, citizens and other stakeholders in the use of disruptive technologies**. This model will be supported with the provision of a data management platform and algorithms for data – driven decision – making in the field of urban transformation and validated by piloting mobility use-cases in the context of the proliferation of sharing services.

The general objective presented above is broken down into several objectives. Next, we present the objectives as they appear in the DoA as well as which activities have been carried out during this period in order to achieve each of them.

O1: Create an in-depth knowledge on the different implications of the use of the disruptive technologies, such as big data analytics, algorithmic techniques, and simulations in the public sector context as well as **a thorough understanding of the impact of the use of disruptive technologies** in participants of the mobility and urban transformation value chain with the aim of providing a set of recommendations and lessons learned that will enable public authorities to develop pathways for the introduction of such disruptive technologies.

This objective will be realized through the following Key Results (KR) by the end of the project, namely:

KR1: Social Policy Lab (SoPoLab): a thoughtful space where the trust of the society and public servants in technologies can be analysed and the early outcomes of the project discussed with the main actors of the new urban mobility scenario: citizens, service providers, public servants and policy makers. The social policy lab will build upon two pillars: 1) co-creation sessions, both for the policy-related aspects and the design of the platform and 2) the empirical analysis on trust, attitude, impact, benefits and risks of the stakeholders in the use of URBANITE's disruptive technologies.

Based on the local insights and testimonies collected in the two previous SoPoLab iterations as well as a desk research on European regulation on sharing services in urban mobility, this session was focused on designing and developing practical solutions, road maps and next steps translating the insights gained in the two previous sessions into practical policy and requirements from the stakeholders' point of view, specifically public servants and end users (citizens). We carried out four local sessions (one per pilot city) to gather insights and

feedback from policy makers and a final presentation at the European level during the OASC Annual Summit & General Assembly 2023.

From an internal process perspective, big efforts have also been made in terms of better tracking the co-creation process and SoPoLab deployment in each of the cities. In that respect one-to-one meetings and a monthly logbook has been put in place in order to track and control the whole process. Involvement of private organizations, NGO's and end-users in future activities has also been encouraged.

- **KR2: URBANITE Impact analysis and pathways:** this impact analysis has included aspects such as benefits, risks and potential of the disruptive technologies; the attitude of civil servants towards the use of these new and disruptive technologies; trust of citizens and other stakeholders such as the service providers in the decisions made by the public sector as a result of the use of such “intelligent” technologies. Besides, lessons learnt, recommendations and best practices from the application of disruptive technologies in different domains, beyond mobility and urban transformation, have been gathered. Both of these are reported in D2.6, from an empirical point of view.

O2: Provide automatic mechanisms to harvest, curate, fusion and visualization of existing open and proprietary data coming from different sources related to urban mobility and transportation (e.g., city infrastructure, usage of car and bike sharing by the citizens, and so on).

- **KR3: URBANITE Data Management Platform:** scalable platform that allows the harvesting of data from open and closed repositories as well as its curation, fusion, storage and visualization. This platform will support a common structure for domain specific data and metadata representation. It will follow a modular design of multiple connectors and harvesters that enables extensibility as new data sources need to be included during or after the duration of the project.

The work in this period to achieve the objective has revolved around the following activities: One key focus has been the expansion of our data harvesting capabilities. We have added more harvesters, and more data models allowing us to access a wider range of data sources and store them accordingly. Additionally, the existing harvesters have been updated to enhance their functionality. These harvesters are equipped to handle different data formats and can transform the harvested data into the JSON formatted data models.

To further enhance data retrieval performance, we have implemented the Data Aggregation API. This API leverages the time series storage capabilities of OpenTSDB to improve response times when retrieving large volumes of data, such as traffic models. The Data Aggregation API provides the flexibility to retrieve data aggregated by customized time periods. Additionally, it supports various operations on the data, including the calculation of minimum and maximum values, among others.

Furthermore, we have extended the Data Retrieval API to support the newly introduced data models. This enhancement ensures that data retrieval processes align with the established structure and standards. To maintain data security and privacy, access to the Data Retrieval API has been restricted to internal usage only. Recognizing the importance of open data and public accessibility, we have also developed a new API called OpenDataRetrieval. This dedicated interface enables the retrieval of datasets that are intended to be publicly available.

The tangible results of this objective are reported in the second version of the data –related processes D3.3, D3.6 and D3.8.

O3: Facilitate the policy decision-making processes in the context of mobility and urban transformation where several stakeholders are involved with the provisioning of a scalable, integrated and modular ICT ecosystem built upon disruptive technologies such as big data, algorithmic techniques, simulations, cloud computing and Internet of Things.

- **KR4: URBANITE Algorithms and simulations:** These algorithms and simulations are designed to support the decision – making process, by analysing the current situation taking into account the data harvested and fused through KR3, the trends that occurred in a certain timeframe allowing to predict future situations, when changing one or more variables.

The work towards the fulfilment of this objective has revolved around the following aspects:

The simulation module and the simulation scenarios have been updated with new population modelling algorithms and new travel demand modelling algorithms. These algorithms exploit some of the data gathered in the URBANITE Data management platform to improve the simulations. The simulation module has been parametrized to enable the creation of new simulation scenarios based on the predefined ones and thus allow the users to analyse possible outcomes of mobility policy changes or future events. The parametrization is based on the specific use case of each pilot city. The module does not allow for creation of fully custom simulation scenarios as that would be out of the scope of the project time- and resource-wise, and could not be implemented in a user friendly way as required for the targeted end users of the system, which are decision makers, not traffic simulation experts.

Several of the KPIs that were co-designed with the pilot cities have been updated and changed in order to better support the end users, and to usable for the decision support system and for the recommendation engine. The decision support engine has received several updates to fix bugs as well as updates of the UI to improve the usability and readability of the results. The recommendation engine has been redesigned and implemented as part of the URBANITE ecosystem, based on the developed decision support system, exploring different approaches: a multiple-criteria decision analysis MCDA-based +/-1 (2) analysis, collaborative filtering based on previous choices and preferences.

In the field of data analysis, it is worth highlighting the work in three lines: the calculation of the so-called Bike Safety Index, the computation of Noise due to urban traffic and the development of the global presentation of the traffic state. Improvements have also been introduced in the bicycle trajectory analysis module.

- **KR5: URBANITE Ecosystem:** This is the main result of the URBANITE project and aggregates all aspects of the project, namely the citizen participation, both social (citizen participation, attitude and trust in disruptive technologies, co-creation) and technical aspects (data management platform, algorithms and so on). The URBANITE Ecosystem includes the integration of KR2- KR5.

The work around the fulfilment of this objective has revolved around the following aspects:

- Conduct a comprehensive analysis of the requirements, both functional and non-functional. This reflects the strong commitment to understand the need and

expectations of stakeholders by introducing use case and user perspectives into the technical development, validation, and refinement phases

- URBANITE Ecosystem version 2 was successfully deployed and operational, following the established DevOps strategy.
- URBANITE Ecosystem version 3 (Final) encompasses the integration of final versions of all technical components. A meticulous deployment and testing process was executed to ensure the fulfilment of requirements outlined for the ultimate version.
- Enhance the architecture for the intermediate and final releases of the integrated URBANITE Ecosystem accurately reflecting the latest versions of the technical components, along with their interdependencies and customized features for each pilot.
- Formulate a comprehensive strategy for deploying the URBANITE Ecosystem within an alternate infrastructure.
- Increase the security measures for accessing various components.
- Provide guidance and assistance during the initial phases of DevOps strategy implementation as well as setting up 4 use case environments.
- Ensure consistent maintenance and support for the four distinct environments.
- Devise and implement updates for the User Interface (UI) to accommodate diverse modules and their associated functionalities.

The tangible results of this objective are summarised in D5.8 and D5.9 URBANITE Ecosystems second and final versions (software and report) reaching MS5 and MS7 compliance.

O4: Validate URBANITE Key Results in 4 real use cases. URBANITE will setup the validation context in the participating municipalities (Amsterdam, Bilbao, Helsinki and Messina), with the aim of subsequently progressively developing and refine the URBANITE ecosystem.

- **KR6: URBANITE Use cases implementation.** Implementation and deployment of the URBANITE Ecosystem in each of the use cases.

The work in this period to achieve the objective has revolved around the following activities:

- guiding implementation of the use cases through strict collaboration and synchronisation with the technical work packages
- monitoring of the technical developments of both the URBANITE Platform and of its verticalisation into the four use cases to meet their specific requirements
- consolidating and improving the evaluation framework and relative adoption.
- aligning the sections of the questionnaire that concern the use cases satisfaction degree and the cross-department interoperability with the SUS methodology. In addition, two additional sentences have been included in the use cases satisfaction degree section.
- Organising of four evaluation sessions; this included the design of the sessions (topics to be presented, the definition of the general structure and agenda of the evaluation sessions, stakeholders' involvement and engagement, identification of suited tools for live collecting and managing of feedback during the sessions, session holding, animation of debates and feedback collection, submission of the questionnaire, collection of answers, analysis of feedback collected during the evaluation session and answers to the questionnaire).

O5: Develop a viable business model to ensure the sustainability of URBANITE. This shall include a detailed identification of business scenarios, associated services, pricing schemas and a business plan.

- **KR7: Comprehensive business plan:** The business plan shall include a market competitors' analysis, the competitive advantage of URBANITE, the profit and cost analysis, and the route to the market. It will also include a sustainability plan for the services offered through the use of the URBANITE disruptive technologies in the selected use case cities.

The work towards the fulfilment of this objective has revolved around the following aspects:

- Finalised URBANITE offers.
- Updated market overview and related trends and gaps analysis.
- Finalised the URBANITE business model.
- Performed URBANITE forecasting scenarios.
- Analysis of Joint Exploitation paths and of draft agreement for the creation of an Alliance.
- Updated partner's individual exploitation plans.
- Signed Letter of Intent to outline the interest in the joint exploitation activities.

The tangible results of this objective are reported in D7.9.

Commentato [FP7]: still being edited by ENG

The next table shows the progress of each of these KPIs in the timeframe of the project. For this reporting period, different success indicators have been established and evaluated.

Table 2. Expected evolution of the project KPIs

KPI	Year 1	Year 2	Year 3
KPI1.1: 3 rounds of sessions, 2 at European level sessions and 3 at local level (1 per city/node)	Carrying out the first session of the Social Policy Lab at European Level	Carrying out four local sessions of the Social Policy Lab at city/node level	Carrying out a second European level Social Policy Lab
KPI1.2: Availability of the Virtual (SoPoLab Digital Space)	The SoPoLab Digital Space infrastructure is available as part of the URBANITE website	SoPoLab Digital Space is populated with the results of the SoPoLab sessions held.	SoPoLab Digital Space is populated with the results of the SoPoLab sessions held
KPI2.1, KPI 2.2: URBANITE Impact Analysis and Pathways are published on the URBANITE Virtual SoPoLab (SoPoLab Digital Space)	Definition of the methodology to determine the impact analysis (trust and attitude), to engage citizens and civil servants in the co-creation activities	Publication of the initial version of the impact analysis and recommendations on the URBANITE Virtual SoPoLab (SoPoLab Digital Space)	Publication of the final version of the impact analysis and recommendations on the URBANITE Virtual SoPoLab (SoPoLab Digital Space)
KPI3.1: Level of completeness (measured against requirements and functionalities fulfilment (completion).	100% of the specifications completed 10% of the specifications implemented	80% of the specifications implemented All modules of the Data Management platform are integrated 100% of the improvements	100% of the specifications implemented All modules integrated and validated 100% of the improvements suggested by the use cases are integrated

KPI	Year 1	Year 2	Year 3
		suggested by the use cases are evaluated	
KPI3.2: Number of meaningful sources where the data is harvested from is bigger than 5	Number of sources harvested: 2	Number of sources harvested: 4	Number of sources harvested: 4
KPI4.1: Precision of predictions (ratio of correctly predicted positive observations to the total predicted positive observations) in the prediction algorithms	Precision rate: 50% (*)	Precision rate: 60%	Precision rate: 80%
KPI4.2: Qualitative evaluation of the DSS performance in terms of user-friendliness and quality of recommended policies or procedures.	Developed questionnaires.	At least 50% positive reviews obtained from the questionnaires.	At least 90% positive reviews obtained from the questionnaires.
KPI5.1 Level of completeness (measured against requirements and functionalities fulfilment (completion) of the whole ecosystem and of each of the components. The ecosystem resulting of this objective is fully functional in order to offer to the citizens all the functionalities to use and transform the public service	100% of the specifications completed 10% of the specifications implemented	80% of the specifications implemented. All modules of the URBANITE ecosystem are integrated 100% of the improvements suggested by the use cases are evaluated	100% of the improvements suggested by the use cases are integrated

KPI	Year 1	Year 2	Year 3
KPI6.1: At least 70% of the features of the ecosystem will be tested and evaluated in each use case and the overall validation will cover 100% of the features.	Requirements from the use cases are elicited, aligned and prioritized. Evaluation methodology and trajectory is finalized	25% functionalities assessed by each use case	70% of the features are validated per use case 100% of the URBANITE ecosystem are validated overall
KPI6.2: the satisfaction degree of the use cases, measured by means of questionnaires, is of at least 90%.	Satisfaction questionnaires are developed	40% of satisfaction degree	At least 90% of satisfaction degree
KPI7.1: URBANITE business plan has a horizon of 4 years after the project end with mechanisms in place to allow its evolution and renovation within that period	Market competitors identified, first version of the business models for each KR, individual exploitation interests	Market competitors identified, first version of the market size, updated version of the business models for each KR, initial pricing strategy for each KR	Market competitors identified, first version of the market size, final version of the business models for each KR, final pricing strategy, profit and cost overview, route to the market.

As regards the remaining evaluation criteria (i.e. Criteria #5, #6 and #7 concerning the usability of the solution, the degree of use cases satisfaction and cross-department interoperability), it was instead decided to apply at this stage a lean approach in order to collect the needed information in an effective and timely manner. For this reason, a simplified questionnaire summarizing the main aspects to be investigated was preferred than the full set of questionnaires envisaged for these criteria in the evaluation framework.

In this phase, the evaluation activities were mainly held by the project partners representing the four use cases (Amsterdam, Bilbao, Helsinki and Messina) involving local relevant stakeholders in each city and with the support of the technical partners for the aspects concerning purely the technical and functional evaluation of the URBANITE Ecosystem.

Commentato [UC18]: As detailed on D6.5?

Table 3. Status of the KPIs for M39

KPI	Year 3	Comments
KPI1.1: 3 rounds of sessions, 2 at European level sessions and 3 at local level (1 per city/node)	Carrying out a second European level Social Policy Lab	The final event of the URBANITE project took place at the OASC- Open & Agile Smart Cities Annual Summit & General Assembly in Brussels, taking advantage of the attendance of policymakers, public servants at the event. The challenges, each city faced in urban mobility planning and how URBANITE support the adoption of a

KPI	Year 3	Comments																								
		data-based policy decision-making were presented and discussed.																								
KPI1.2: Availability of the Virtual (SoPoLab Digital Space)	SoPoLab Digital Space is populated with the results of the SoPoLab sessions held	The results of the different SoPoLab sessions were updated on the Virtual SoPoLab and also published on the project website as blogs gaining attention from the general public.																								
KPI2.1, KPI 2.2: URBANITE Impact Analysis and Pathways are published on the URBANITE Virtual SoPoLab (SoPoLab Digital Space)	Publication of the final version of the impact analysis and recommendations on the URBANITE Virtual SoPoLab (SoPoLab Digital Space)	The impact analysis and recommendations were updated on the Virtual SoPoLab and also published on the project website as blogs gaining attention from the general public.																								
KPI3.1: Level of completeness (measured against requirements and functionalities fulfilment (completion).	100% of the specifications implemented All modules integrated and validated 100% of the improvements suggested by the use cases are integrated	Deliverable D6.5 reports the result of the evaluation (Criterion #2 - URBANITE Requirements Level of Completeness). All requirements of the Data Management Platform have been implemented; only 1 of them is marked as “partially covered”. From a formal perspective it could be considered as implemented since a set of core capabilities is available.																								
KPI3.2: Number of meaningful sources where the data is harvested from is bigger than 5	Number of sources harvested: 4	<table border="1"> <thead> <tr> <th></th> <th>*</th> <th>**</th> <th>***</th> </tr> </thead> <tbody> <tr> <td>Amsterdam</td> <td>1</td> <td>2</td> <td>4</td> </tr> <tr> <td>Bilbao</td> <td>0</td> <td>1</td> <td>7</td> </tr> <tr> <td>Barcelona</td> <td>0</td> <td>0</td> <td>8</td> </tr> <tr> <td>Madrid</td> <td>0</td> <td>2</td> <td>6</td> </tr> <tr> <td>Project</td> <td>1</td> <td>2*</td> <td>25**</td> </tr> </tbody> </table> <p>As detailed on D6.5, the majority of the harvested data sources are three stars ranked (each use case made use from 4 to 8 three stars ranked data sources). The minimum threshold of meaningful data sources can be considered reached. The total amount of three stars ranked data sources (considering only one time the data sources used by more than 1 use case) is 22 (D6.5 erroneously reports 25)</p>		*	**	***	Amsterdam	1	2	4	Bilbao	0	1	7	Barcelona	0	0	8	Madrid	0	2	6	Project	1	2*	25**
	*	**	***																							
Amsterdam	1	2	4																							
Bilbao	0	1	7																							
Barcelona	0	0	8																							
Madrid	0	2	6																							
Project	1	2*	25**																							
KPI4.1: Precision of predictions (ratio of correctly predicted positive observations to the total predicted positive	Precision rate: 80%	Precision of forecasting is very dependent on the specific functionality:																								

Commentato [Ug9]: @All: please check.

KPI	Year 3	Comments
observations) in the prediction algorithms		<ul style="list-style-type: none"> Traffic prediction with an accuracy of around 80% (R2) with different display modes. Incorporation of confidence interval at 80% of the predictions. Estimation of OD matrices in buses (including drop-off stop) at 65%.
KPI4.2: Qualitative evaluation of the DSS performance in terms of user-friendliness and quality of recommended policies or procedures.	At least 90% positive reviews obtained from the questionnaires.	<p>Deliverable D6.5 reports the result of the analysis of the survey responses completed on the evaluation activities. Following the SUS methodology, the sentences relevant to this indicator were selected, extracting their responses only positive and neutral responses (agree, strongly agree and neutral) in the case of positive sentence form as well as only negative and neutral responses (disagree, strongly disagree and neutral) in the case of negative sentences form.</p> <p>The average scoring is 91,67%.</p>
KPI5.1 Level of completeness (measured against requirements and functionalities fulfilment (completion) of the whole ecosystem and of each of the components. The ecosystem resulting of this objective is fully functional in order to offer to the citizens all the functionalities to use and transform the public service	100% of the improvements suggested by the use cases are integrated	<p>Deliverable D6.5 reports the result of the evaluation (Criterion #2 - URBANITE Requirements Level of Completeness). All requirements have been implemented (these include suggestions coming from the use cases); only 8 of them (out of 73) are marked as "partially covered" (representing 11% of the requirements). From a formal perspective these could be considered as implemented since a set of core capabilities is available.</p>
KPI6.1: At least 70% of the features of the ecosystem will be tested and evaluated in each use case and the overall validation will cover 100% of the features.	70% of the features are validated per use case 100% of the URBANITE ecosystem are validated overall	<p>Deliverable D6.5 reports the result of the evaluation. All the use cases reached the threshold of 70%.</p> <ul style="list-style-type: none"> Amsterdam - Tested features: 36 out of 38 (95%) Bilbao - Tested features: 37 out of 38 (97%) Helsinki - Tested features: 31 out of 38 (82%) Messina - Tested features: 34 out of 38 (89%)

Commentato [Ug10]: @All: please check.

Commentato [Ug11]: @All: please check.

Commentato [Ug12]: @All: please, check.

KPI	Year 3	Comments
KPI6.2: the satisfaction degree of the use cases, measured by means of questionnaires, is of at least 90%.	At least 90% of satisfaction degree	<p>Satisfaction degree of the use cases is 8,33 % negative, 91,67% positive or neutral.</p> <p>This percentages have been calculated considering the amount of positive, negative and neutral feedback provided by respondents to the sentences reported in the questionnaire in the sections "Use Cases Satisfaction Degree" and "Use Cases Satisfaction Degree - Use Case specific sentences".</p> <p>The detailed percentages are:</p> <ul style="list-style-type: none"> • Positive: 72,46% • Neutral: 19,20% • Negative: 8,33%
KPI7.1: URBANITE business plan has a horizon of 4 years after the project end with mechanisms in place to allow its evolution and renovation within that period	Market competitors identified, first version of the market size, final version of the business models for each KR, final pricing strategy, profit and cost overview, route to the market.	URBANITE's business plan has a time horizon of 5 years. Three scenarios were defined in relation to the targeted municipalities that might be interested in the URBANITE solution. The analysis shows a broad view of its marketability and its sustainability. Deliverable D7.9 reports and describes the business plan, along with the identified market competitors, market, business scenarios (that include business model, pricing models, cost and revenue analysis, etc.).

1 Explanation of the work carried per WP

In the next sections, the work performed in this reporting period M25 to M39 is detailed per WP. Partners and WP leaders are requested to provide this information on a six-monthly basis.

1.2.1 Work Package 1 – Project Management

1.2.1.1 Summary of work progress and achievement during the period

1.2.1.2 Detailed Work for each task

Task number	Detailed work
Task 1.1 Project coordination and day-to-day management	<p>The activities performed by the project coordinator are as follows:</p> <ul style="list-style-type: none"> • General coordination of the consortium to ensure that the project objectives are met. This coordination is ensured both in administrative and technical terms by TECNALIA.

Task number	Detailed work
	<ul style="list-style-type: none"> • Monitored the project and partner progress, in terms of work performed, effort and budget reported • Monitored that the project procedures, templates and supporting tools defined are duly complied with by all partners, so as to ensure a fruitful and effective cooperation among partners, in order to meet the project's objectives • Keep fostering a good and collaborative atmosphere among partners so as to achieve the best results for all stakeholders. • Coordination of the consortium, addressing raised issues • Organization of general assemblies and monthly teleconferences, including the preparation of the agenda and the meeting minutes • Set up the communication infrastructure: mailing lists, a document management system (Alfresco) and on-line conference and collaborative tools (Teams, Sharepoint). • Development and updates of the project Data Management Plan, outlining which research data is managed, in compliance with the template provided by the European Commission. • Transmission of agreements and requests to the PO • Created, edited and delivered the deliverables corresponding to this WP, namely the final reporting period at M39 and D1.6 as well as finalizing D1.5. • Agree, formulate, and handle project amendment extending the project for 3 months
Task 1.2 Quality assurance	Ensured that all deliverables are submitted following the quality and review procedures defined in D1.1. Revised and monitored the compilation of all project deliverables due in M25-M39.
Task 1.3. Periodic reporting	Reporting periodically to the European Commission about the project progress towards the project objectives. Preparation of the reporting period at M39, D1.6 and final review.
Task 1.4. Innovation management	Follow-up and monitoring of the execution of the URBANITE Innovation Process.
Task 1.5. Ethics management	In coordination with WP8, management of all ethics-related aspects of the project: analysis of related regulations and check with external ethical committee, analysis of privacy ensuring actions and supporting security mechanisms.

1.2.1.3 Significant results

The results of this work package are as follows:

- D1.5 Policy Brief (preliminary findings) delayed from M24 to M29 due to its dependency with D2.4 “SoPoLab second session - Create: going into the details of challenges and designing roadmaps”.
- D1.6 Policy Brief (Main findings).
- An analysis, extending a previous work carried out by the MobiliseYourCity Initiative¹, offers a global policy framework and practical guidance for policy making on data sharing in the context of urban mobility. Specifically, extends the concept to a collaborative data-driven policy making thus including the collaboration and processing stages and policy areas, and provides specific supporting templates and samples supporting such good practices and policy suggestions.
- This Final Report.

1.2.1.4 Deviation from DoA

The deliverable D1.5 Policy Brief (preliminary findings) was due M24 and was finally submitted on M29 integrating the findings from D2.4 (submitted in M24).

Regarding D1.5, the preliminary policy briefs are based on the results of the SoPoLab sessions, available as of when the document was planned, requiring more time for its process. On the other hand, the focus of the document was not clear, and it took time and consultation to identify the best approach to summarize the conclusions.

On the other hand, D1.6 takes as its starting point D2.6, which, as will be explained later, was delayed at the end of the project to take into account the latest work and observations with the pilots/end users. The conceptualization and design of infographics have required additional time with minor delay.

1.2.1.5 Failure to achieve objectives

All the objectives of this work package have been properly achieved despite the minor delays detailed above.

1.2.1.6 General Assembly meetings and/or conference-calls during that period

Note that WP meetings and other joint workshops are reported in each WP.

General Assemblies

Meeting	Date	Venue	Purpose
7 th General Assembly	15-16/06/2022	Bilbao	<ul style="list-style-type: none"> • Project status • Data management platform status and next steps • Functionalities and challenges from the simulation and analysis perspective • Current status of the platform instances: D5.8: URBANITE Ecosystem.

¹ <https://www.mobiliseyourcity.net/sustainable-mobility-policy-making-data-sharing>

Meeting	Date	Venue	Purpose
			<ul style="list-style-type: none"> • Status and next steps of the use case scenarios (AMS, BIO, HEL, MES) and their deployment • Project exploitation, innovations, and business opportunities. • Common awareness of project activities •
8 th General Assembly	26-27/010/2022	Messina	<ul style="list-style-type: none"> • Project status • Internal workshop among Urbanite partners in which we will reflect on the co-creation process carried out in WP2 and the lessons we have learned. • Demo of functionalities and challenges from the simulation perspective • Data analysis, maps and Recommendation Engine. Common functionalities across UCs • Data management platform status vs DOA • Project dissemination, exploitation, innovations, and business opportunities. • Common awareness of project activities •
9 th General Assembly	14-15/12/2022	Amsterdam	<ul style="list-style-type: none"> • Project status • Demo of functionalities and challenges for each use case, next steps • Hands-on simulation process • Project dissemination, exploitation, innovations, and business opportunities. • Review of the last developments on WP3. • Common awareness of project activities • Working towards the last SoPoLab meeting • Planning final meeting

Monthly teleconferences

- Monthly teleconferences are held to monitor the overall progress of the project. The attendance is mandatory for all WP leaders. Other partners are encouraged to participate. In general, all partners participate. The conference usually lasts 1h. On the 9th General Assembly, considering the deep dependence among the work packages (WP2, WP4 and WP6), it was agreed to keep bi-weekly follow-up meetings with additional focus meetings (e.g., recommendation engine, key non-functional requirements or key results) as needed.

Meeting	Date	Venue	Purpose
Monthly follow-up conference	12/05/2022	Teams	<ul style="list-style-type: none"> • Report progress of the previous month and plan for next month.

Meeting	Date	Venue	Purpose
			<ul style="list-style-type: none"> • Management issues • Dissemination activities • AOB
Monthly follow – up conference	14/07/2022	Teams	<ul style="list-style-type: none"> • Report progress of the previous month and plan for next month. • Management issues • Dissemination activities • AOB
Monthly follow – up conference	08/09/2022	Teams	<ul style="list-style-type: none"> • Report progress of the previous month and plan for next month. • Management issues • Dissemination activities • AOB
			•
Monthly follow – up conference	10/11/2022	Teams	<ul style="list-style-type: none"> • Report progress of the previous month and plan for next month. • Management issues • Dissemination activities • AOB
Bi-weekly follow – up conference	12/01/2023	Teams	<ul style="list-style-type: none"> • Report progress of the previous month and plan for next month. • Management issues • Dissemination activities • AOB
Bi-weekly follow – up conference	31/01/2023	Teams	<ul style="list-style-type: none"> • Feedback from the PO • Plan for the amendment preparation • AOB
Bi-weekly follow – up conference	09/02/2023	Teams	<ul style="list-style-type: none"> • Amendment voting • AOB
Bi-weekly follow – up conference	23/02/2023	Teams	<ul style="list-style-type: none"> • Workpackage activities • Conclusions and recommendations report • Technical developments and integration • European level event • Dissemination and Communication activities • Management issues • EOB
Bi-weekly follow – up conference	16/03/2023	Teams	<ul style="list-style-type: none"> • Workpackage activities • Dissemination and Communication activities • Management issues • EOB •

Meeting	Date	Venue	Purpose
Bi-weekly follow – up conference	30/03/2022	Teams	<ul style="list-style-type: none"> • Workpackage activities • Dissemination and Communication activities • Management issues • EOB •
Bi-weekly follow – up conference	27/04/2023	Teams	<ul style="list-style-type: none"> • Validation sessions • Technical developments and integration • European level event • Dissemination and Communication activities • Management issues EOB
Bi-weekly follow – up conference	28/05/2023	Teams	<ul style="list-style-type: none"> • Status of WP2-WP7. • Activities performed in the last month • Active discussions • Input requirements, which information do you need from other WPs or partners • Status of deliverables • Detailed actions for the next month and actions assignment (who will do what) • Dissemination activities performed and planned. • Project management issues • AOB
Bi-weekly follow – up conference	08/06/2023	Teams	<ul style="list-style-type: none"> • Use case validations • Status of the platform • Last deliverables • Update on the WP7 activities • Project events: BDVA (Lulea) and final event (Brussels). • EOB
Bi-weekly follow – up conference	22/06/2023	Teams	<ul style="list-style-type: none"> • Status of the platform • Last deliverables • Update on the WP7 activities • EOB

1.2.2 Work package 2 - Social impact of disruptive technologies

1.2.2.1 Summary of work progress and achievement during the period

WP2 overall goal was to assess the social impact of disruptive technologies in public administrations and to develop new proposals for government processes and decision-making tools through the direct contributions of public servants, citizens and other stakeholders in a co-

creation process. This goal was achieved through co-creation processes at an ideation and development level and at a social impact assessment level.

Task 2.1 Analysis of experiences in other industries

This task studied the societal impact of the use of disruptive technologies by public institutions. This exploration centered around local mobility decision-making that is aided by an ecosystem of various data sources and disruptive technology. From this central case, T2.1 identified use cases, challenges, and recommendations that are more broadly relevant for any public decision-making process that incorporates disruptive technologies. Crucially, the research conducted in this task emphasizes the need for the use, development, and implementation of disruptive technologies to align with *public values* and the missions of public institutions who use them.

Following its acceptance, D2.1 “Analysis of Experiences in Other Industries” was updated with an addendum. The D2.1 Addendum presented links between the case studies (published in the original version of D2.1) and Urbanite Pilots. This includes descriptions and insights from local pilot SoPoLabs.

Task 2.2 Social Policy Lab

A very important part of the work done in WP2 for the period of time covered by this report has been around the third edition of the SoPoLab “Policy: translating insights into practical policy and requirements”.

The first step was going into the details of challenges that arose in the first two SoPoLab sessions “Ask: defining challenges and formulating shared values and principles” and “Create: going into the details of challenges and designing roadmaps” (information available in D2.3 and D2.4, respectively) and designing roadmaps for policy co-creation as well as deepening into the results of D6.1 “URBANITE use cases requirements and evaluation methodology” in order to framework the discussion. This information has marked the starting point for this task.

In addition, WP2 has actively collaborated in the launching and participation of the Task Force for Use Case refinement, directly involving WP2, WP4 and WP6.

The goal of this task force was to define together the next steps and functionalities, identifying relevant stakeholders (SMEs, ONGS, etc.), including the social dimension, to engage in supporting URBANITE in different roles (providing feedback, as potential users of the Urbanite platform, involved in policy-making process, as a participant on co-creation sessions, as data providers, etc.), potential additional data-sources, etc. This was also a way to think further about the project, in terms of exploitation of the results and its social impact. Moreover, the insights gained in the two previous sessions needed to be translated into practical policy and requirements from the stakeholders’ point of view, specifically public servants and end users (citizens).

Subsequently, the objectives and the specific methodology for each of the 4 cities for the implementation of the third SoPoLab were defined.

Different realities of urban mobility in cities have required different approaches to carry out this third session as well as different states of definition of use cases. That is why the output of the session reflected these divergences and the future plans for each of the co-creation sessions in the pilot cities within WP2. The last ecosystem session allowed for the convergence of the work done in the pilot cities, since the ecosystem demonstration was uniform across the four cities.

All the cities shared, however, one of the main objectives that were set in the project for this third round of SoPoLabs, which is to start deepening in aspects of policy-making. Some cities in the definition and design of future policies, others in the benefits that a collaborative design of policies would bring and others in the challenges or barriers that these policies should address.

All the information regarding this session is available in deliverable D2.5 – SoPoLab third session “Policy: translating insights into practical policy and requirements”.

The development and delivery of the Urbanite D2.6, including a list of recommendations for policy makers using data-driving technologies to inform their decision-making.

Finally, the pilots shared their outcomes with the rest of the cities in a final session at European level, in order to identify which conclusions and lessons learned from the different pilots could be replicated at European level and also explore collaboration opportunities with other city-related decision-making initiatives. This final event of the URBANITE project, organized in coordination with WP7, took place at the OASC- Open & Agile Smart Cities Annual Summit & General Assembly in Brussels, Belgium presenting the challenges, each city faces in urban mobility planning and how URBANITE manages data, AI and simulation to support the adoption of a data-based policy decision-making. It was also possible to know the technical and functional details of the platform, from the data gathering to advanced visualization at the URBANITE stand.

Commentato [Ui13]: I have included this comment because at the time of writing, there was still no information available on the project website related to this event.

Commentato [GU14]: Someone started writing this section, but didn't finish it. Who was working on this?

Commentato [GU15]: This task is M1-M36(M39?). We have not been very active with this during the past months. How should we report this? (Heli)

Commentato [GU16R15]: Or can we count blog posts to be part of this?

T2.3 Virtual SoPoLab

Partners continued to use the Virtual SoPoLab (URBANITE Forum) during this period. However, thanks to the reduction of restrictions due to the pandemic, partners greatly preferred face-to-face meetings for interacting with local stakeholders. Nevertheless, even with less intensity with respect to the previous period (due to the reduced amount of support requests), project partners received the needed support in getting used to the Forum.

T2.4 Impact analysis, lessons learned and recommendations

As part of this task, partners built upon earlier work in WP2, in particular from research in D2.1 and outcomes of SoPoLabs and other stakeholder input. The research in this task was further aided through a co-creation session at the General Assembly in October 2022; through multiple sets of one-on-one interviews with project partners; and through ongoing monitoring and documentation of partners' progress and stakeholder feedback. D2.6 “Impact analysis and recommendations” is planned for delivery by end June, 2023.

1.2.2.2 Detailed Work for each task

Task number	Detailed work
T2.2	<ul style="list-style-type: none"> Co-designing an approach for executing the third SoPoLab sessions in the 4 pilot cities Facilitating several internal knowledge/information material exchanges to prepare partners for the last SoPoLab Preparing the third SoPoLab in the four pilot cities with relevant partners Organising the third SoPoLab in the pilot cities Document all actions taken and results obtained in D2.5 “SoPoLab third session “Policy: translating insights into practical policy and requirements” Prepared for the final project review

Task number	Detailed work
T2.3	<ul style="list-style-type: none"> • Providing technical support for the correct use of the Virtual SoPoLab • Bug fixing and technical maintenance of the Virtual SoPoLab
T2.4	<ul style="list-style-type: none"> • Supporting the monitoring and documenting of WP2 activities • Setting up a framework for writing this deliverable • Documenting WP2 processes that will serve as input for the D2.6 deliverable • Organisation and facilitation of the internal co-creation session at the General Assembly in Messina in October 2022 • Conducting one-on-one interviews with the technical and pilot partners to gather information for D2.6 • Prepared for the final project review

Commentato [GU17]: Did we do this?

Commentato [GU18]: What happened with the virtual sopolab in the end? Were those the evaluation sessions or the final event at the conference in Brussels?

1.2.2.3 Significant results

Significant results of this WP in this period are

1. The successful execution of the third SoPoLabs in all pilot cities (T2.2) in a consistent and coordinated manner, which enabled partners to gain & share interesting insights and learn from one another.
2. The development and delivery of the Urbanite D2.6, which has produced a valuable list of recommendations for policy makers using data-driving technologies to inform their decision-making.

1.2.2.4 Main innovations

The main innovation in the period M25-M39 include:

- Allowing civil servants in the pilot cities and beyond to gain a deep understanding of how disruptive innovations can threaten or improve democratic governance of mobility policy and data, particularly with regard to civic participation, (social and environmental) sustainability, and shared values including openness, transparency, equality, and accountability.
- Increasing the trust of civil servants in the use of 'disruptive' technologies through opportunities to see and test the technologies and to ask how those technologies are developed. There is a high need to make technical development participatory, in order to increase mutual trust. In Urbanite, we have increased this trust through continued meeting with the formal and informal stakeholders and SoPoLabs. There have been opportunities to ask all the questions, regardless of the existing expertise and technical understanding of the stakeholders.
- Collaborative approach through SoPoLab session to start deepening in aspects of policy-making. Some cities in the definition and design of future policies, others in the benefits that a collaborative design of policies would bring and others in the challenges or barriers that these policies should address.

Commentato [GU19]: You may have ideas related to tech dev, but I'd say that I've learned that trust to use 'disruptive' technologies increases if there are opportunities to see, test and ask how those technologies are developed. Also, there's a high need to popularize technical development, in order to increase mutual trust. FVH has increased trust in a form of continued meeting with the stakeholders (formal & informal) and SoPoLabs. There have been opportunities to ask 'stupid questions' even if the stakeholders are professionals already. (Heili)

1.2.2.5 Deviation from DoA

Certain cities, such as Helsinki, for example, continued to focus the SoPoLabs on simulation aspects, so the showcase was held during the evaluation sessions in May and June 2023, where we had a stable and robust version to demonstrate. This additional fourth SoPoLab brought cities together again, with the help of Urbanite ecosystem platform which was demonstrated to the stakeholders in different cities in similar ways. To prepare for these demonstrations, we held a smaller scale demo for the Amsterdam stakeholders at the General Assembly in Amsterdam in

December 2022. This allowed us to get feedback on the platform, as well as to understand how the stakeholders experience the platform and which features they appreciated, missed, or needed clarification on.

The additional evaluation sessions led to a delay in the submission of Deliverable D2.6, in correspondence with the extension of the project to M39. The pilot partners organised evaluation sessions in each of the cities to demonstrate the final version of the platform and reflect on the use of the disruptive technology. The input gathered in these sessions was invaluable to the project and needed to be included D2.6.

1.2.2.6 Failure to achieve objectives

Although there was a delay in the submission of D2.6 in compliance with the schedule agreed upon in last amendment. This delay has not had an impact on the technical activities of the project.

1.2.2.7 WP meetings and/or conference-calls during that period

Meeting	Date	Venue	Purpose
General Biweeklies	Every second Thursday	Microsoft Teams	Coordination with all the project partners
WP2 Biweeklies	Every second Tuesday	Microsoft Teams	Coordination between Tecnalía and Waag
Workshop at General Assembly	October 2022	Messina	Gathering input for D2.6 Impact Analysis and recommendations
Demo for Amsterdam stakeholders General Assembly	December 2022	Amsterdam	Gathering feedback on the platform and increasing trust in the platform
Interviews between Waag and partners	March 2022	Microsoft Teams	Gathering input for D2.6 Impact Analysis and recommendations

1.2.2.8 Partners contributions

Next the contributions of the partners participating in this WP are detailed.

TECNALIA

Tecnalia has actively participated in each of the tasks defined in WP2.

Tecnalia has collaborated with the pilot cities, mainly Bilbao and Messina in the design, organisation and execution of the third SoPoLab. Giving support in the ideation, in the preparation of material and concretely dynamizing the third SoPoLab session in Bilbao.

Tecnalia has document all actions taken and results obtained in the third SoPoLab sessions carried out in the four pilot cities, in D2.5. Tecnalia has contributed to deliverable D2.6 Impact

analysis and recommendations, on the challenges and specifically in those aspects related to the actionability of the models and algorithms, thus the model acceptance factors and explainability and the ethical aspects of data management and trusted data analytics and artificial intelligence application. All these activities have been co-organised with WAAG, leader of WP2, maintaining a constant and fluid communication.

AD

In this WP Alma Digit participated in the calls and contributed to the activities related to the task T2.2, Social Policy Lab. In particular, Alma Digit supported the Municipality of Messina to organize preparatory events (in virtual and physical mode) for the realisation of the third SoPoLab by meeting stakeholders and deepening the study and analysis of the DECIDIM platform, an important part of the asynchronous interaction of stakeholders. From the third SoPoLab carry out mainly two objectives: the test of a new way to work together (PA and stakeholders) and discuss about the mobility problems.

Alma Digit together with the Municipality of Messina contributed to production of Deliverable D2.5 with the description of the third SoPoLab outcomes. Alma Digit also supported the municipality in defining next steps and use case plans and contributed to the gathering of the lessons learned and recommendations for D2.6.

MESSINA

The Municipality of Messina participated actively to the WP2's meetings. We contributed to the activities related to the task T2.2, Social Policy Lab. In particular, the Municipality of Messina and Alma Digit organized preliminary events (in virtual and physical mode) to meet stakeholders and prepare them to the main event, the third SoPoLab. The objectives of the third SoPoLab were mainly two: the test of a new way to work together (PA and stakeholders) and discuss technically in virtual and physical mode, about the mobility problems. The municipality presented and described to the project partners how it intended to carry out its activities and experiences through shared documents. It presented its activity plan and how it planned to proceed so that the other pilots could also take inspiration from its work.

In addition, the Municipality contributed to the D2.5 with description of third SoPoLab outcomes. All outcomes were used to define next steps and plans for the use-case. Messina also contributed to the gathering of the lessons learned and recommendations for D2.6.

ENG

During the third year of the project, in WP2, ENG mainly contributed to the management of the Virtual SoPoLab (URBANITE Forum).

ENG supported the other partners in the use of the Virtual SoPoLab, explaining its functionalities and helping in its usage (e.g. by email or during dedicated remote meetings).

In the same period, ENG performed bug fixings on the Virtual SoPoLab, and supported the organisation of the evaluation sessions in the four use cases from the perspective of WP2 and in collaboration with WP6, acting as the main bridge between the two work packages.

Furthermore, ENG continued to support the other activities of WP2 by monitoring and documenting the progress of this Work Package, with the aim of collecting the information needed for the analysis of the impact and for the identification of recommendations and lessons learned.

ENG participated in dedicated sessions organised by Waag for the identification of recommendation for D2.6.

FVH

FVH has contributed to WP2 by active collaboration with Waag and Tecnalía throughout bi-weekly WP meetings and monthly one-to-one meetings. The needs and action points required from Helsinki use case has been discussed and refined both by engaging stakeholders representing the city of Helsinki, Port of Helsinki, Aalto University, Helsinki Regional Transport and private companies and in collaboration with WP2 partners in several sessions.

FVH also provided content to be published on the URBANITE Forum. We have prepared two blog posts about the URBANITE virtual SoPoLab and one to FVH's webpage. The 3rd SoPoLab (6/2022) aimed to shed light on present tools used in traffic planning (esp. traffic simulations) and what kind of (socio-political) assumptions are behind these tools. WAAG and TECNALIA commented on the aim of the workshop and its contents. The workshop raised plenty of positive feedback and helped to understand that the URBANITE ecosystem can help to popularise the logic behind certain disruptive technologies, like AI and simulation development. FVH has maintained active communication and organised meetings with stakeholders regularly.

Commentato [GU20]: Is this a correct way to say it? (Heli)

Helsinki evaluation session (5/2023) was organised at FVH's office with TECNALIA's and ENG's leads. FVH contacted the participants and further opened the idea of the ecosystem. The objective of the workshop was to showcase the features, functionalities, and benefits of the ecosystem and gather feedback from the attendees. The event was successful, with the ecosystem receiving very positive feedback from the participants.

Commentato [GU21]: Is this correct? (Heli)

During the reporting period, FVH has helped the city to build a data platform and ecosystem for traffic data in co-operation with the city's LIDO project. FVH helped the city to understand user's needs, increase the usability of the ecosystem and bring people together in the context of URBANITE project and earlier workshops. FVH has brought together and advanced dialogue between highly-skilled specialists, academic and non-academic researchers, companies and traffic planners working with traffic simulations and traffic planning. Together, these actions have significantly strengthened the smart mobility data ecosystem in the region.

FVH has defined the central stakeholders, their tasks and expectations related to the platform continuously and has refined mapping of stakeholders for D2.2. FVH has reported the insights obtained in the third SoPoLab for D2.5. FVH has actively participated in the development of D2.6.

WAAG

WAAG, as WP2 leader, has led the work in the work package. We have developed and executed a second series of SoPoLabs in Amsterdam, whereby we re-established contact with stakeholders around the issue of data collection and data sharing in relation to bike mobility in the city. We have gathered shared ambitions for a data collaboration and formulated potential use cases for a data collaboration.

Besides the activities in Amsterdam, we have, in cooperation with Tecnalía, organised WP2 meetings in order to assist the cities in formulating the focus of their second series of SoPoLabs, aiming at getting a better understanding of who Urbanite's local stakeholders and end-users are. To do this, we organised a couple of WP2 workshops.

Also, in cooperation with Tecnalía, we have drafted a new approach to support the other pilot cities in preparing for the 3rd SoPoLabs. We have drafted a logbook in which we will keep track

of progress in all pilot cities. The logbook offers space to record pilot cities' next steps to take, questions for support that come up, outputs delivered, meetings organised etc.

Waag led deliverable D2.1 "Analysis of Experiences in Other Industries" which is a series of case studies that are relevant for anyone working with disruptive technologies as part of a local mobility decision-making process. Multiple partners contributed case studies to this deliverable. Waag led deliverable D2.6 Impact analysis and recommendations, for which we conducted a co-creation session, desk research, and interviews with partners to gather the necessary information and reflect on the lessons learned. The resulting piece is relevant for all public authorities who utilise disruptive technologies as part of a decision-making process.

AMST

AMST contributed to biweekly or monthly calls and co-designed an approach for the SoPoLabs in general, and specifically, for the SoPoLabs in Amsterdam. We organised several one-on-one meetings with the different stakeholders, both within and from outside the organisation, exploring how to work together on data: from data-gathering (for policy makers), data-management (involving technicians) and data-literacy (data-'producers' like cyclists and Amsterdam residents).

The aim and challenge are to work on 'reciprocity' with data. We therefore formulated an MOU with our stakeholders Fietsersbond and Ring-Ring.

Datacommons Cycling happiness

The "Datacommons Fietsgeluk" is a pioneering initiative of Fietsersbond, Ring-Ring, Waag and the municipality of Amsterdam, which join forces to:

- To increase the cycling happiness of Amsterdammers, starting in Amsterdam-North; *our collective dream is Amsterdam cycling city #1.*
- Everyone on a bicycle in Amsterdam-Noord feels safe and comfortable, for bicycle rides of less than 15 kilometers the bicycle is the best option.
- Consciously developing a new approach by collecting and analyzing data together. *This is how we work on data emancipation: data literacy and data control with the Amsterdammer.*

We are building a working prototype of a datacommons. Each partner from their own point of view and approach, all from a shared passion for cycling in the city.

We do this by:

1. Defining cycling happiness in a broad sense: happiness for young and old, from traffic fluidity to social and infrastructural safety;
2. Bringing together our relevant (cycling) data, collecting missing data and jointly analyzing results and using visualisations, to investigate algorithms and simulations:
 - a. optimal and safe routes for: cyclists aged 8 and 80, 'general cyclists' and fast cyclists and other fast cycle path users; We do this by developing a so-called bike safety index, as described in workpackage 6.3.
 - b. the consequences of a densifying North. Lots of houses are built in Noord, what if every household will have 1 electric bicycle and all those people want to use the current cycling infrastructure?
 - c. Map the current data ecosystem to see where and how cycling data is collected and used.

- d. We developed two lessons for a undergraduate school where we collected GPS and other traffic related data with children. The purpose was to foster data literacy by building understanding with children of how data can be collected, interpreted and used by themselves, by others and by policy makers.

To set-up a datacommons several governing principles has to be established and agreed upon. The first steps have been taken by signing a MoU, agreeing upon a goal and discussing under what conditions the data can be used by people that are part of and that are external to the commons. In a datacommons it is important that the collection of data from citizens and the way citizens, NGO's, companies and municipalities are engaged is transparent. Only this way there can be mutual trust towards the way civil servants act upon collected data.

In 2023 we organised several trainings and workshops on collaboration on data as a disruptive technology, in the line of data cooperatives/ data commons/ citizen science. We started a pilot with Telraam in Amsterdam-Noord and organised several inspiring workshops, also with citizens.

BIL

The municipality has lead the work for the preparation of the third URBANITE SoPoLab. Bilbao city has involved in this SoPoLab staff from different areas of the mobility and sustainability department as well as personnel from the IT municipal company. They have actively participated in the session and review and provide feedback to D2.5. BIL has also contributed to review and provide lessons learn for the elaboration of D2.6

MLC

MLC has participated in periodic WP2 meetings along this reporting period. MLC has hosted the third SoPoLab executed the 17th of June 2022 and supported BIL in the organization by preparing and sending the invitations to the list of external stakeholders identified at the beginning of the project and preparing all the logistics aspects. MLC has worked with TECNALIA in the preparation of the session dynamic and content. MLC has actively participated in the session supporting in the animation and bringing its knowledge and experience. MLC has contributed to the elaboration of the report of the session sharing gathered notes during the execution and reviewing and providing feedback to Bilbao conclusion in D2.5. MLC has aslo contributed to D2.6 gathering lessons learnt and drawing recommendations

1.2.3 Work package 3 - Data Management Platform

1.2.3.1 Summary of work progress and achievement during the period

The main objectives of this work package are to:

- Develop connectors and implement harvesting pipelines for the data sources required by the use cases and WP4
- Specify data models for those domains that are not covered by FIWARE
- Expand the existing data management platform to support more data models

During this period, the activities performed in WP3 mainly focused on:

- Writing of deliverables D3.3, D3.6, and D3.8
- Implementation and integration of harvesters and the corresponding pipelines
- Implementation of additional data models
- Discussion on different data governance solutions

1.2.3.2 Detailed Work for each task

Task number	Detailed work
T3.1. Data harvesting modules	<ul style="list-style-type: none"> • Identification of new data sources • Implementation of Connectors based on API definitions of identified sources • Harvesting or generation of more datasets: calendar data for the 4 cities for 2023, Helsinki (bike trips), Amsterdam (Telraam data, Ring Ring districts, bike O/D matrices, list of schools, sport facilities, transport stations including ferries), Bilbao (bike O/D matrices, Wi-Fi zonification and Wi-Fi O/D matrices)
T3.2. Data curation modules	<ul style="list-style-type: none"> • Development of transformation scripts for the data sources connected to T3.1 • Development of the Data Anonymization component. • Data quality tests on harvested data • Discussion on different data governance solutions
T3.3. Data aggregation and storage	<ul style="list-style-type: none"> • Completed the development and deployment of the data storage and retrieval components to support new models such as CensusObserved, PopulationObserved, ElectroMagneticObserved, NoiseLevelObserved, OriginDestination Matrix and MapLayer. • Development of the new OpenDataRetrieval API to provide access only to the datasets that are offered openly. • Improvement of the getDistinct service of the Data Aggregation component to support multi-value aggregations. • Consolidated the Data Catalogue, implemented bug fixes, and improvement of its UI.

1.2.3.3 Significant results

The main results obtained in this period in WP3 are:

- Submission of deliverables D3.3, D3.6, and D3.8
- Completed the developments of the “URBANITE Data Management Platform”
- Development of a new component for Data Anonymization
- Quality checks on harvested data
- Addition of several connectors

The following connectors have been developed. Note that this list does not include scheduling, transformation, and exporting since these are generic to all pilots.

Pilot	Component Name
Amsterdam	<ul style="list-style-type: none"> • Amsterdam OIS • Air Quality • Telraam
Bilbao	<ul style="list-style-type: none"> • Air Quality • Football Calendar • Traffic Flow
Helsinki	<ul style="list-style-type: none"> • Ferry Flow • Traffic Flow • Harbour Flow
Messina	<ul style="list-style-type: none"> • Messina Commune

Generic	<ul style="list-style-type: none"> • OpenWeatherMap • OpenStreetMap • File • XML • WebWrappers
---------	---

Other data that has been harvested but is not included into the pipeline (as the harvesting is done once or from files provided by the city) are:

- Calendar data
- Districts
- Bike rental stations
- Bike trips in Bilbao
- Amsterdam Ring-Ring data
- Amsterdam Schools
- Amsterdam sport places
- Amsterdam Transport stations
- Helsinki Bike Trips

1.2.3.4 Main innovations

One notable innovation is the platform's scalable and modular design, allowing for seamless integration of new data sources through an extensive range of connectors and harvesters. Additionally, the platform enables efficient data transformation during the harvesting process, accommodating various data formats and storing the data uniformly as JSON as a FIWARE data model. Another key advancement is the implementation of the Data Aggregation API, which leverages advanced time series storage techniques to improve performance and facilitate customized retrieval of large data volumes.

1.2.3.5 Deviation from DoA

For D3.6, the submission was delayed by a small number of days as the internal review revealed that an additional round of editing was necessary for the level of quality desired.

1.2.3.6 WP meetings and/or conference-calls during that period

Meeting	Date	Venue	Purpose
WP3 JourFixe	10/05/2022	Teams	Addition of Harvesters/Data Sources, Errors in Existing Harvesters
Urbanite - Datavaults	23/05/2022	Teams	Initial discussion of possibilities integrating the DataVaults projects with Urbanite
WP3 JourFixe	24/05/2022	Teams	Discussion of integration of CaPe consent tool and DataVaults into Urbanite
WP3 JourFixe	07/06/2022	Teams	Discussion of integration of CaPe consent tool and DataVaults into

Meeting	Date	Venue	Purpose
			Urbanite; Preparation for General Assembly
WP3 JourFixe	21/06/2022	Teams	General Assembly Follow-up; CaPe/DataVaults/ new Harvesters for Messina/Amsterdam/Helsinki
WP3 JourFixe	05/07/2022	Teams	Harvesting Sources for the Messina & Amsterdam Pilots, new Datamodels for new Data
WP3 JourFixe	19/07/2022	Teams	Harvesting Sources for the Messina & Amsterdam Pilots, new Datamodels for new Data
WP3 JourFixe	16/08/2022	Teams	Harvesting Sources for the Messina & Amsterdam Pilots, new Datamodels for new Data
WP3 JourFixe	30/08/2022	Teams	Discussion of deliverables D3.3, D3.6 & D3.8; Additional Harvesters for Amsterdam
Amsterdam Sources	29/08/2022	Teams	discuss possible sources for Amsterdam Pilot
WP3 JourFixe	30/08/2022	Teams	Discussion of deliverables D3.3, D3.6 & D3.8; Additional Harvesters for Amsterdam
WP3 JourFixe	13/09/2022	Teams	Discussion of deliverables D3.3, D3.6 & D3.8; Additional Harvesters for Amsterdam
WP3 JourFixe	27/09/2022	Teams	Discussion of deliverables D3.3, D3.6 & D3.8; Harvester improvements
WP3 JourFixe	11/10/2022	Teams	Preparation for next GA
WP3 JourFixe	08/11/2022	Teams	GA 8 follow-up
WP3 JourFixe	06/12/2022	Teams	Additional Harvesters for Amsterdam; Harvester modifications; Data cleaning
WP3 JourFixe	14/02/2023	Teams	Discussion on harvested data; Discussion about Journal Contributions

1.2.3.7 *Partners contributions*

Next the contributions of the partners participating in this WP are detailed.

TECNALIA

During this period, TECNALIA has harvested or generated the following datasets:

- calendar data for the 4 cities for 2023,
- bike trips for the city of Helsinki
- district zonification used by Ring Ring, bike O/D matrices, list of schools, sport facilities, transport stations including ferries for the city of Amsterdam
- bike O/D matrices, Wi-Fi zonification and Wi-Fi O/D matrices for the city of Bilbao

Besides, TECNALIA has extended the Data Storage & Retrieval API to support new models in order to meet the requirements of WP4, such as CensusObserved, PopulationObserved, ElectroMagneticObserved, NoiseLevelObserved and OriginDestination Matrix. A new model named MapLayer has also been included to fulfil the requirements of the UI in order to display different layers in GeoJSON format in a map.

Improvement of the getDistinct service of the Data Aggregation component to support multi-value aggregations.

To guarantee that only authorized users can store and retrieve data, the Data Storage component is deployed without external access. This means that only components in the same network will have access to the endpoints. Regarding data retrieval, a new API was implemented, i.e. OpenDataRetrieval, that provides access only to the datasets that are offered openly. This way, access to proprietary data through the Data Retrieval component is restricted and users will only have access through the OpenDataRetrieval to public data, aggregated data or to analysis and simulation results based on the data, but not to the raw data.

TECNALIA has also developed a new component for Data Anonymization which allows a) to anonymize generic values by transforming them to a hash value, and b) to anonymize trajectories by removing GPS locations outside an area or by removing the start and end GPS locations closer to a given distance in meters.

Finally, regarding the deliverables, TECNALIA has contributed actively to D3.3, D3.6 and has led the work in D3.8.

AD

Alma Digit participated in the calls and supported the activities of the Municipality of Messina in process of retrieving, harvesting and exposing new relevant data sources.

AD supported the Municipality to develop the software infrastructure of the Messina Edge Component. Thanks to this component AD developed APIs that allow other technical partners to retrieve information related to the traffic flow and LPT or different dataset related to the Municipality of Messina. All the activities were carried out to facilitate the release of open data by the Municipality of Messina in his Official Portal, and to create a unique point of access for analysis and processing.

Alma Digit worked to the new version of the deliverable D3.3 related to the Data Harvesting Modules and Connectors. The main activity is the one related to the description of the

component, his function and the specification related to the improvement integrated in the component using new algorithms based on the bucket concept.

MESSINA

The Municipality of Messina participated actively and consistently in WP3 calls and contributed to the activities related to the task T3.1, Data Harvesting Modules.

The Municipality created the software infrastructure of the Messina Edge Component to connect the existing services of the Municipality of Messina with the URBANITE platform, exposing data in a highly optimized and secure way. The Municipality worked actively with AD to design, develop and deploy the software related to the Messina Edge Component. In particular, this work enables the cooperation with other services in use within the Municipality to continuously share new data, making it available to the URBANITE platform and thus being able to take advantage of them. Other activities are related to the process of searching and collecting new valuable data-sources.

Working to his implementation the Municipality of Messina improved his open-data Portal with new datasets. Besides, the Municipality contributed to deliverable D3.3 re-visioning the content and composing the section on Messina Edge Components.

ENG

During this period of the project, ENG contributed to the different technical activities carried out for the data collection, harmonisation and management; these included analysis of the data sources in order to support also the technical activities carried out by the other Work Packages, in particular WP6. In this sense, ENG kept the synchronisation of the activities between WP3 and WP6.

ENG consolidated the Data Catalogue and implemented bug fixes, improving its ability to being part of the URBANITE Platform; this included also improvement of the UI of the Data Catalogue and to the middleware to translate the NGSI-LD compliant data (retrieved from the Data Storage and Retrieval) into the data format and structure accepted by wizard to create charts from a selected dataset. Among these improvements also the integration with the JoinUP web site to support the user in understanding compatibilities of licenses of datasets.

To do so, ENG also implemented a middleware to translate the NGSI-LD compliant data (retrieved from the Data Storage and Retrieval) into the data format and structure accepted by this add-on.

ENG also contributed to the deliverables D3.3, D3.6 and D3.8.

FhG

As the head of WP3 FhG coordinated the implementation of the WP3 responsibilities of the data management platform. FhG is also responsible for implementing harvesters for the Amsterdam and Messina Pilots. Also, the implementation of the new transformation capabilities on the harvesting side.

Leading the deliverables D3.3 and D3.6 was also one of FhGs responsibilities.

BIL

BIL has contributed mainly to task 3.1 by providing data sources and models for the development of the Bilbao use case evolving around tools for traffic prediction, bike and public transport O-D matrix.

1.2.4 Work package 4 - Algorithms and simulation techniques for decision - makers (JSI)

1.2.4.1 Summary of work progress and achievement during the period

This section summarizes the progress towards main project objectives.

The main objectives of this work package are:

- Develop and deploy tools for big data exploration in the domain of urban mobility.

Several specific data analysis modules have been created based on specific needs of the use cases in the last period have been refined and updated. These are the traffic prediction, global traffic prediction, traffic OD matrix, bike trajectories, bus OD matrix, noise computation, bike OD matrix, bike data, traffic evolution, weekly traffic flows and LPT critical areas, each targeting a specific data analysis or exploratory analysis task that was identified as important in collaboration with the pilot cities partners. Some of these tools have been improved in this reporting period for better usability. This includes changes to the algorithms as well as improvements of the user interface to make results more clear, user interaction more obvious and generally improve the user experience.

Widgets (plug-ins) for the Orange data mining platform have been developed that allow the users to load data from the URBANITE data platform and the mobility policy simulation module and thus enable custom exploratory data analysis tasks. These are not available in the Orange widget catalogue as they need to be set-up for each pilot city and are not useful outside of URBANITE ecosystem.

- Design methods for detection of important events.

The mobility policy simulation module has been parametrized to allow the simulation of custom variations on the predefined simulation scenarios provided. For each of the pilot cities a set of parameters have been provided, related to the use case. Only a limited number of parameters is available to change for each city to keep the creation of simulations simple for users and to keep the implementation of a robust system feasible within the constraints of the project.

- Provide recommendations and support for policy creation.

The common evaluation framework has been improved regarding the correctness and accuracy of KPI calculations. The decision models have been improved to support the development of the recommendation engine and to better support decision making.

The recommendation engine design has been assessed as infeasible for use and redesigned. The new design of the recommendation engine has been implemented and tested. The new recommendation engine has several weaknesses compared to the originally conceived one but produces useful recommendations, is explainable, and simple to use.

- Develop advanced visualization methods to support policy creation.

Commentato [VM22]: from Maj Smerkol (JSI), to remove if too optimistic. We have a demonstration available, but this is only available as source code rather underdeveloped

The prototype of the map-based traffic visualizations has been updated and expanded with visualisations of local KPI values. Initial visualization implementations will be further upgraded.

The prototype of the map-based traffic visualizations has been updated and expanded with several new types of information. Also the implementation of the calculation has been improved to fully support more KPIs to visualize them, as well as evaluate the policy quality.

Visualization methods. Several new visualizations have also been developed in order to visualise the results of the data analysis modules; this is of special importance in the case of The Global Traffic Prediction module which is mainly a change in the visualization of the Traffic Prediction module and the Noise Computation with a strong visualization component been added. These include bike safety score, number of public transport users, long pedestrian trips, acoustic pollution and more.

- A new advanced visualization of scenario comparison has been added. It allows up to 5-dimensional interactive visualization of selected KPIs for multiple scenarios and the changes of the KPI values over time throughout the simulated day. To make sure this visualization is accessible, it is possible to customize the number of different KPIs shown at the same time. Deployment of the tools and methods developed.

We have cooperated with other technical partners on updates to the system architecture. The prototype of the traffic simulation system module has been expanded and upgraded to include more functionalities. The user interface has been updated to support new functionality, such as parametrized creation of custom simulations.

We have cooperated with other technical partners on updates to the system architecture. The prototype of the traffic simulation system has been expanded and upgraded to include more functionalities. The user interface has been updated to reflect some of the early feedback from pilots and other partners.

The modules have been updated after gathering user feedback. The user interfaces have been streamlined to be more readable and easier to use. We have adapted the workflow for some of the developed tools in accordance with user requirements.

1.2.4.2 Detailed Work for each task

Task number	Detailed work
T4.1 Methods for Exploratory Data Analysis and User Interaction	<ul style="list-style-type: none"> • Implementation of the new Data Analysis modules and improvements of the existing ones • Slight improvement of the user interface of the Orange widgets that allow exploration of URBANITE data sources and simulation outcomes in Orange data mining platform • Modifications for the bike analysis modules to be able to filter according to type of day, part of day or specific day. • Implementation of the Safety analysis Index for the bike analysis in the Amsterdam use case and the visual comparison with the accidents in the city.
T4.2 Recommendation engine and policy support systems	<ul style="list-style-type: none"> • Improvements of KPI calculating modules, implementation of missing KPIs • Adaptation of the city decision models for use in recommendation engine • Redesign, implementation and testing of the recommendation engine.

Task number	Detailed work
T4.3 Policy simulation and validation engine	<ul style="list-style-type: none"> • Improvements of supporting algorithms, such as synthetic population generation and simulation calibration methods- • Improvements to the traffic simulation tools- • Parametrization of simulation creation • Improvements in the Noise Simulation engine to be better adapted to the output from the traffic simulation, to run more efficiently and to show the results in a more intuitive way.
T4.4 Advanced visualization methods	<ul style="list-style-type: none"> • Added more map-based visualizations of KPIs and improvement on the existing map-based visualizations • Improved the interactivity of the visualizations. • A new advanced visualization method has been implemented supporting simulation scenario comparison and decision support. • Development of the Global Traffic Prediction module which allows the visualization of the predictions for the whole city all at once and according to a user choice of values for the parameters of the predictive models.

1.2.4.3 Significant results

The main results of the work package WP4 achieved in this period are:

- The recommendation engine has been redesigned and implemented.
- All city specific KPIs are implemented, and the city specific decision models have been improved, which together represents the finalization of the common scenario evaluation framework.
- Several city specific KPIs are implemented, and the city specific decision models have been developed improved, which together represents the finalization of the common scenario evaluation framework.
- Creating custom simulations is now supported by the parametrization of simulations.
- The decision support system is improved with a new advanced interactive visualization that shows comparison between multiple scenarios via selected KPIs and their values throughout the simulated day.

1.2.4.4 Main innovations

Description of WP innovation

Common scenario evaluation framework has been fully implemented and is now used, with different KPIs and decision models, in all four pilot cities.

The traffic simulations that are very difficult and time-consuming to create can be created much quicker and without expert knowledge. This was achieved via a combination of pre-designed simulation inputs and algorithms that can generate these inputs based on specific harvested data. and the exposure of simulation parameters to the end user.

The traffic simulations can be evaluated and city specific KPIs calculated automatically. This allows for multi attribute comparison of simulated mobility policy changes. The decision support system exploits these results, as does the recommendation engine.

The recommendation engine provides general recommendation on whether a scenario is better than baseline as well as specific recommendations that inform the user which aspect of improvements to focus on to improve the general scenario quality best. While the

recommendations are not directly actionable, they guide users to explore other possible scenario variations.

Conformal Algorithm is being used in computing the confidence interval for the traffic prediction, first time ever used to the knowledge of the partners.

The specific considerations, needs and feedback provided by the use cases has been strongly taken into account introducing its perspective into data-driven modules, i.e. incorporation of a safety aspect within the Bike Analysis Module (achieved through contrasting safety index computations with stored actual accident data), the enhancement of the Global Traffic Prediction Module (enabling comprehensive accessibility to citywide traffic prediction outcomes), the refinement of the Noise Computation Module (introducing iso-surface to monitor consistent noise computation locations along with an improvement in response times), and adaptations to the Bike Trajectory Module (allowing trajectory analysis for distinct days or various categories of days).

Progress of innovation for the period M25-39

The synthetic population generation and traffic simulation calibration algorithms have been tested with two of the pilot cities each and need further work to be useful in all four use cases. Other pilot cities have different data available and the methods need to be appropriately modified. This is currently ongoing all the pilot cities. The algorithms have been iteratively improved.

Commentato [VM23]: this paragraph doesn't make sense to me

With regard to the automation of traffic simulation creation, some of the steps have been implemented and simplified. A simulation can be built using predefined or automatically generated models (e.g., population model, travel demand model, road network) but not all advanced functionality is available for such automatically generated simulations. We are currently working on supporting more flexible simulation generation and improving the predefined models.

The creation of simulations has been improved and more flexibility added via parametrization. While the simulation creation is not fully customizable and new simulations need to be based on existing predefined simulations, it is easy to do for non-technical users, fast and painless.

The recommendation engine has been deemed infeasible and redesigned, implemented and tested.

1.2.4.5 Deviation from DoA

The deliverable D4.4 URBANITE traffic flow model has been delayed for two months due to some technical issues with the traffic simulation module and the population model and the travel demand model. At the time we were using multiple approaches to the travel demand modelling, which caused a significant raise in complexity and therefore the time required for testing and debugging. Some of the delay was also due to issues with COVID-19.

The deliverable D4.6 Final implementation of the recommendation system for policy design has been delivered with a 10-month delay. There are several reasons for this delay. The initial design of the recommendation system has been described in deliverable D4.5. Recommendation system for policy design, and the implementation of it started with some delay due to delays on the traffic simulation module, mentioned above. Initial experiments using the genetic algorithms approach proved the approach to be too computationally expensive, even after trying several optimization techniques, such as using heuristics to search for feasible solutions and using a surrogate model to assess solution validity instead of a full simulation. These experiments

Commentato [IC24]: @JSI
This deliverable was planned for M36 (last amendment) and uploaded to the EU portal in M40. It would be appropriate to reflect this in the text, reporting a 10-month delay does not reflect those changes in the amendment.

required significant time to set up and run due to their complexity, also other approaches were explored, but in all cases a volume of complete simulations was required, that is, including all indicators, which was not available. The recommendation engine design was redesigned from the ground up. The new approach builds on top of the decision support system.

1.2.4.6 Failure to achieve objectives

Not applicable.

1.2.4.7 WP meetings and/or conference-calls during that period

Meeting	Date	Venue	Purpose
WP4 meeting	20/05/2022	GoToMeeting	Status overview, discussion of using Helsinki existing simulation models
WP4 meeting	25/05/2022	GoToMeeting	Discussion of using Helsinki existing simulation, status overview
WP4 meeting	10/06/2022	GoToMeeting	Status overview, planning for GA
WP4 meeting	08/06/2022	GoToMeeting	Status overview
WP4 meeting	27/07/2022	GoToMeeting	Status overview, planning integration
WP4 meeting	24/08/2022	GoToMeeting	Components status, planning for new recommendation engine, integration discussion
WP4 meeting	08/09/2022	GoToMeeting	Components status, planning for testing and debugging
WP4 meeting	14/09/2022	GoToMeeting	Status overview, planning deliverable and GA
WP4 meeting	05/10/2022	GoToMeeting	Status overview, testing the demo of deployed components
WP4 Simulations demo	08/11/2022	GoToMeeting	Demo of simulation capabilities for Bilbao
WP4 Simulations demo	18/11/2022	GoToMeeting	Demo of simulation capabilities for Amsterdam
WP4 Simulations demo	25/11/2022	GoToMeeting	Demo of simulation capabilities for Helsinki
WP4 Simulations demo	02/12/2022	GoToMeeting	Demo of simulation capabilities for Messina
WP4 session	26/01/2023	GoToMeeting	Presentation of the ML tool
WP4 meeting	22/02/2023	GoToMeeting	Status overview, planning for testing and debugging
WP4 meeting	09/03/2023	GoToMeeting	Status overview, planning for integration
WP4 meeting	16/03/2023	GoToMeeting	Status overview, planning for integration

Meeting	Date	Venue	Purpose

1.2.4.8 Partners contributions

Next the contributions of the partners participating in this WP are detailed.

TECNALIA

Tecnalia has been working in the following Data Analysis modules:

- Traffic Prediction Module: the work in this module has been completed cleaning and testing the integrated module.
- Global Traffic Prediction Module: This is a new Module that allows to visualize the results produce from the previous module in a global manner allowing to visualize the whole city at once.
- Bike Analysis Module: The Safety factor computation has been incorporated in the case of the Amsterdam use case. Also, for this use case a mechanism to upload the results into the global URBANITE storage which allows to perform visualization with other quantities stored. The functionality to compare the safety index computation with the actual accidents stored has been included.
- The Noise Computation Module has gone through very serious changes, including internal changes to adapt the input to the output from the simulations, now only two of the files are crucially needed:
 - output_events.xml.gz
 - output_network.xml.gz

The need for output_facilities.xml.gz has been relaxed a now it is inferred from the output_events file. In addition, the visualization has been also modified, the old fashion point visualization has evolved to iso-surface visualization which allows to visualize the locations where the noise is computed to have the same values. Other aspect that has been drastically improved is the computational time needed to perform a noise computation.

- Bike Trajectory Module: Different filters have been implemented that allows to visualize the trajectories for different specific days or different types of days.
- Different recommender methods have been designed and evaluated in the first case, given a decision model, identify the combination of KPIs that maximize the general indicator (Mobility Policy Quality) defined for each of the pilots. The second, provides a list of actions that maximize a cost function based on the selection and weighting of indicators defined by the council technician. Finally, a third option based on a collaborative-filtering approach identifies a list based on previous experiences.

AD

In this WP AD participated in the calls. During the meetings and supported the partners in the different activities.

The AD team proceeded studying and analysing the tools proposed and the way how to use them changing configurations, running models and evaluating results. Alma Digit was able to partially re-deploy in the Municipality CED the simulation environment, subject of WP4.

AD, together with the technicians of the Municipality, worked on the validation of the simulation methods proposed by partners.

MESSINA

The Municipality of Messina supported the activities of WP4 through one-to-one meetings with the lead partner (JSI) to refine the collection of the data needed for simulation modules. After the phase of studying and implementing a strategy for the positioning of the new cameras within the city, the work converted in analysis of the input files for simulation tools and dedicated call to validate simulation outputs with experts of the Municipality.

ENG

During this period of the project, ENG continued the work carried out during the previous periods, bringing its competencies as a system integrator; ENG provided support for the implementation of the UIs of the simulation tools, helping the adoption of the “guidelines” already provided by WP5. ENG provided feedback concerning the simulation and analytical functionalities developed within WP4, in relation to the objectives and scopes of the use cases. In this sense, ENG played the role of connection between WP4 and WP6, helping and supporting the coordination and alignment of the two Work Packages.

JSI

JSI, as WP4 leader, has led the work in this work package. During the last 12 months we have performed the following activities with regards to the task T4.1:

- Implementation of several widgets for the Orange tool that allow the analysis of URBANITE data platform and simulation module data using Orange.
- Added support for visualization of the results of acoustic noise calculation for simulations to the map based visualizations.

With regards to the task T4.2 we have performed the following activities:

- We have redesigned the recommendation engine system as the initial design proved infeasible.
- Improvements of several KPI calculations and adaptation for use in the recommendation engine.
- Implementation of the recommendation engine according to the new design.
- We have updated the hierarchical decision models for all the use cases both in accordance to updated KPIs and to be better suited for use in the recommendation engine.
- We have developed a new version of the recommendation system based on machine learning models and the traffic simulations. The approach has not been included in the URBANITE ecosystem due to being early in development.

With regards to the task T4.3 we have performed the following activities:

- We have improved the algorithms for generation of the population model and the travel demand model.
- The creation of simulations has been parametrized and now allows for creation of more flexible custom simulations.
- The predefined simulation scenarios have been updated with updated population modelling algorithms and updated travel demand modelling algorithms.

With regards to the task T4.4 we have performed the following activities:

- Added more map based KPI visualizations.

- Implementation of new multi-dimensional interactive visualization of KPIs. The visualization enables comparison of multiple simulation scenarios.
- The radar chart visualization of relative KPI values now allows for selection a subset of KPIs to be shown for improved readability and understandability.

In this reporting period, JSI has, with input from other partners, delivered the deliverable D4.6 Final implementation of the recommendation system for policy design. This deliverable was finished with a large delay. The main reasons for the delay were the need to redesign the recommendation system from scratch after the initial design proved to be infeasible, which was after the implementation of the system was already underway, as we could not begin with experiments before that time. Additionally, smaller delays from components the recommendation engine depends on have caused the work on implementation on the recommender engine to start later than expected. A part of the delay was caused by disruptions in the work process due to COVID-19.

1.2.5 Work package 5 – URBANITE ecosystem integration and DevOps

1.2.5.1 Summary of work progress and achievement during the period

The main objectives of this work package are to:

- To design the overall architecture of URBANITE ecosystem
- To identify URBANITE’s technical, functional, and non-functional requirements, based on the input from the use cases (WP6)
- To set up the DevOps continuous integration environment and strategy
- To integrate and validate the components of the URBANITE ecosystem
- To design and develop the user interface (UI) of the URBANITE ecosystem

During this period, the activities performed in WP5 have been dedicated to:

- Review of the requirements (functional and non-functional) to establish the final version of them and the status in the second and final version of the URBANITE Ecosystem.
- Refine the architecture of the intermediate and final releases of the integrated URBANITE Ecosystem, reflecting the updated versions of the technical components.
- Release the URBANITE Ecosystem v2 in M27, reflecting the technical requirements covered at that moment of the project. The integrated version corresponding to that version was deployed and running in the infrastructure provided by Tecnalia, following the DevOps strategy adopted.
- Release the URBANITE Ecosystem v3 in M36, 3 months later than initially planned due to the extension of the project, and to cover and integrate the final versions of the technical components. This version was deployed and tested to cover the requirements planned for the final version, and a short manual was provided as part of the deliverable D5.9.
- Update the Identity manager (Key Cloak) for securing access to the other URBANITE’s components, whenever security is needed. The user roles have been adapted to the context of the different users and a demo user has been set for demo purposes.
- Define the strategy and resources needed for the installation of the URBANITE Ecosystem in a different infrastructure.
- Support the technical partners to follow the early stages of the DevOps strategy, related to the use of common storage mechanism as well as the assets required to deploy the applications (e.g., configuration files, infrastructure-as-code files, deployment scripts), and the use cases environments (in Tecnalia infrastructure).

Commentato [BS25]: should we say this if there is an amendment?

- Maintenance and support of the four different environments to be used to deploy the technical components and configurations related to the different use cases.
- Design and develop the updates related to the UUI for supporting the different modules and the functionalities provided.
- Reflect the evolution of the different components from the technical work packages and their interactions among them, in a final schema of the architecture. This schema includes the particularities developed for each pilot and the dedicated components.

1.2.5.2 Detailed Work for each task

Task number	Detailed work
T5.1. URBANITE requirements	<ul style="list-style-type: none"> • Finished at M24.
T5.2. URBANITE architecture	<ul style="list-style-type: none"> • Finished at M24
T5.3. URBANITE Continuous integration and DevOps approach	<ul style="list-style-type: none"> • Following the DevOps approach and strategy adopted, support and maintain the different working environments (development, integration, and production) and procedures for being used for software implementations in URBANITE. • Deploy the different components over the four environments for the development and integration of the different versions of the URBANITE ecosystem (v2 and final) • Support the component developers on the integration and deployment issues, as well as provide the resources needed for a successfully integrated platform, in every pilot environment. • Integrate and deploy the four environments dedicated to the test bench of the final pilots supporting the uses cases.
T5.4. User Interface	<ul style="list-style-type: none"> • Consolidation and bug fixing of the UUI. • Revision of the organisation of the menu item of the UUI. • Identification and setup of user roles of the UUI. • Setup of demo user of the UUI with limited capabilities (for demo purposes). • Consolidation of the functionalities for the creation, management and sharing of the custom dashboards; this also included improvements and implementation of bug fixing. • New organisation of the dashboards created by the users implementing three dedicated menu items. • Improved the integration of the custom dashboards with Keycloak for what concerns the capabilities of sharing of dashboards among users, roles or group of users.

1.2.5.3 Significant results

The main results obtained in this period in WP5 are:

- Integration and deployment of the second and final prototype of the URBANITE Ecosystem, providing the functionalities planned at the beginning of the project and updated across the different stages. The work done within the context of the platform is described in the deliverables D5.8 and D5.9 and it can be observed in the 4 available platforms, accessible at: <https://amsterdam.urbanite.esilab.org>,

<https://bilbao.urbanite.esilab.org>,
<https://messina.urbanite.esilab.org>

<https://helsinki.urbanite.esilab.org>

- Support and continuous deployment and integration of the infrastructure for the different environments' repositories and prototype deployment in each of them, and support to their continuous evolution.
- Final URBANITE ecosystem unified GUI.
- Definition of the final architecture depicting the final release of the URBANITE Ecosystem.
- Definition of the final schema of the architecture reflecting the evolution of the different conceptual layers covered by the Ecosystem.
- Review and alignment of the technical requirements and the requirements given by the use cases in order to prioritize or modify the implementation of the different components.
- Evolution and support of the URBANITE UI integrated with the Identity/Authorization Management component and providing a secured access to the rest of the components.
- Deliverable D5.9 describing the final status of the URBANITE Ecosystem, reflecting the requirements and functionalities covered as well as the user manual and instructions for the installation of the prototype on premise.

1.2.5.4 Deviation from DoA

None.

1.2.5.5 Failure to achieve objectives

Nothing to report

1.2.5.6 Plan for the next months

Not Applicable

1.2.5.7 WP meetings and/or conference-calls during that period

Meeting	Date	Venue	Purpose
URBANITE WP5 monthly telco	1/04/2022	MS Teams	Updates and alignment of work.
URBANITE WP5 monthly telco	06/05/2022	MS Teams	Updates and alignment of work.
Specific integration telco.	13/05/2022	MS Teams	Integration of Technical updates support
URBANITE WP5 monthly telco	08/07/2022	MS Teams	Updates and alignment of work.
URBANITE WP5 monthly telco	09/09/2022	MS Teams	Updates and alignment of work.
URBANITE WP5 monthly telco	07/10/2022	MS Teams	Updates and alignment of work.

There were meetings organized within the context of the technical work packages where the status of the URBANITE Ecosystem was discussed and some actions taken, as well as the status and the necessity of several actions to be done that arose from the General Assemblies celebrated during the period.

Besides, calls related to monitoring the status of the entire project were organized. These calls included a slot for the wp5 status, so the WP5 specific monthly meetings were cancelled.

1.2.5.8 Partners contributions

Next the contributions of the partners participating in this WP are detailed.

TECNALIA

TECNALIA has led the work in WP5 by coordinating and supporting the definition, integration, and deployment of the different components over different environments following the strategy defined in previous periods.

During this period, TECNALIA has reviewed and tested the functional and technical requirements associated to each URBANITE component. TECNALIA has also supported the deployment of the external tools, selected to provide some functionalities working with other components.

TECNALIA has also led and supported the integration of the different components developed by the technical work packages into the final prototype over the integration environment, following the DevOps strategy, as well as supporting the specific components needed to each pilot environment in order to provide the functionalities planned for the use cases.

The work done for achieving this important objective, considered as the number five and seven milestones (MS5 & MS7) has been delivered in D5.8 and D5.9 URBANITE Ecosystems second and final versions. These outcomes have been described in a report and an infrastructure from where the prototypes can be accessed. These deliverables (software and report) had been submitted at M27 (second version) and M36 (final version).

During the period, the integration and deployment of the four pilots environment was carried out every time that the technical partners updated their components, in order to perform integration tests with the rest of the platform.

The last deliverable in this period is related to the final architecture and reflects the evolution that the technical components suffered to be adapted to the necessities of the use cases and to cover the issues arisen during previous integrations.

Due to the evolution of the URBANITE Ecosystem and the nature of the integration tasks, the work within the context of the wp5 was an incremental effort and in constant evolution, so our main purpose was to support the activities of the different technical partners and provide their functionalities to the use cases in a friendly and integrated URBANITE platform.

AD

In this WP AD participated in the calls. During the meetings AD supported the partners involved. AD also supported the Municipality of Messina in designing of the environment and infrastructure with virtual capability cloud-based, inside the CED Municipal Department. AD also supported the deployment of ICT Urbanite local platform in this virtual environment and its maintenance during the continuous update process. Besides, it worked on the deployment of the Messina Edge Component and on the improvement of its functionalities seen as a bridge between the Urbanite Platform and the existing ICT platforms in the Municipality. Finally, several tests were designed and carried out to assess the reliability of the local ICT platform.

A description of the Messina Analysis tools of the Urbanite platform were produced for D5.9 Deliverable.

Commentato [UCI26]: Or M27? "Release the URBANITE Ecosystem v2 in M27,"

Commentato [VM27R26]: fixed

MESSINA

The Municipality of Messina contributed to the evaluation and definition of UI items for Messina use case deployment and the part of the Messina Edge Component in terms of privacy needs. The Municipality maintained the production environment and setup the infrastructure for future deployment of the Urbanite local ecosystem. The Municipality participated actively to WP5 meetings and exposed the desired requirements for modules and components of the UI.

ENG

During this period of the project, ENG contributed to this work package under different aspects.

Concerning the URBANITE UI, ENG worked on its general consolidation and bug fixes, the revision of the organisation of the menu item of the UI, definition of roles other than the general Administrator of the platform and on the rules (with in the UI) to make the functionalities available to specific users (e.g. Administration functionalities are now accessible by the Administrator). A demo user with limited capabilities for the simulations (removed the possibility to launch a new simulation due to the heavy computation requirements) was also created.

Another aspect related to the URBANITE UI is the consolidation of the mechanisms for the management of the custom dashboards. Also in this case, the functionalities related to the custom dashboards were improved and different bug fixes implemented.

The consolidation of the custom dashboards also comprised a new organisation of the dashboards created by the users implementing three dedicated menu items (private, shared and public) and a new view of custom dashboards available in each of these menu item.

Improvements of the functionalities related to the custom dashboards also included a better integration with Keycloak for what concerns the capabilities of sharing of dashboards among users, roles or group of users.

ENG also supported the consolidation of the integration of the URBANITE platform and the track of the requirements of the platforms itself.

These activities were also performed under the umbrella of coordination with WP6 for what concern the implementation of the functionalities of the URBANITE Platform are preparatory for the implementation of the use cases (Task 6.2), and for the evaluation (Task 6.3), so linking strongly with WP6.

Finally, ENG contributed to the deliverable D5.8, and D5.8.

FVH

FVH has taken an active role in the development of the ecosystem by bringing valuable use case perspectives and user perspectives into the process. Our commitment to understanding the needs and expectations of our stakeholders has positioned us as an important contributor to the ecosystem development and success. FVH has also brought the perspectives of use case cities to URBANITE technical development. FVH has participated in the WP5 meetings. FVH has also introduced ecosystem to the stakeholders, discussing also the technical content of the ecosystem with them. Together, this has helped WP5 to reach its KR5 'URBANITE ecosystem' aim, where stakeholders' perspectives are integrated into to the technical development of ecosystem in order to create trust towards new technologies and usability of ecosystem.

FhG

The main contribution by FhG in this WP was related to integrating the services developed in WP3 into the data management platform:

- Deployment and integration of harvesting components
- Contribution to the D5.8 & D5.9 deliverables
- Contribution to the integration of the services developed in WP3 into the data management platform

JSI

With regards to the tasks T5.3 and T5.4, we have cooperated with regards to the integration of the developed components. The components developed by JSI have been updated several times, and a new component, the recommendation engine, has been deployed. The components have been updated in accordance with the user feedback, as possible. JSI contributed to the deliverables D5.8 and D5.9 (delivered at M27 and M37 respectively) by describing the components and providing information and graphic materials.

BIL

BIL has contributed to the identification of requirements for URBANITE, and has provided feedback on different URBANITE modules developed for the city use cases

1.2.6 Work package 6 - Use Cases**1.2.6.1 Summary of work progress and achievement during the period**

The main objectives of this work package are:

- To consolidate the use cases.
- To refine requirements of the use cases for the other technical work packages (WP3, WP4 and WP5).
- To implement the use cases.
- To evaluate the achieved results.

During this period, the activities performed in WP6 have been dedicated to the implementation of the use cases, as well as to the evaluation of the use cases and of the project.

Concerning the implementation of the use cases, this activity has been performed in strict contact with technical work packages, creating numerous links between them and the WP6, as well as WP2 for what concerns the identification of potential recommendations coming from the experience gained in the use case implementation. This approach has been preferred to better synchronise and align the activities conducted in other work packages (e.g., WP3 concerning the data sources to be harvested, WP4 for the data analyses and simulations, WP5 for the integration and of the components needed by the use cases and implementation of specific functionalities such as the custom dashboards). The methodological approach adopted in this period followed the same multistep mode adopted during the second year of the project, and included the consolidation and refinement of the requirements (in collaboration with the technical work packages).

In detail, through continuous cycles, the requirements of the use cases have been verified against the technical developments and vice versa, the technical activities have been steered

according to the requirements, also leveraging the application scenarios that was previously identified.

The technical implementation of the use cases has been based on one of the application scenarios per use case, while the second application scenario mainly served as guide and reference.

This approach was decided to better focus and coordinate the technical activities.

As mentioned, the technical activities have been carried out in strict cooperation with the technical work packages and the result was a customised instance of the URBANITE Platform for each use case, that includes the connection to specific data sources (and related data ingestion processes), specific simulations, data analysis, and related visualisations.

Furthermore, starting from selected requirements of the use cases, four storytelling of usage of the URBANITE Platform has been designed, that includes the identification of ingested data sources, user roles, interaction among them, data analysis and visualisations addressing the identified requirements, etc. This resulted in the implementation of four custom dashboards (one for each use case), built leveraging the capabilities offered by the URBANITE Platform, also in terms of data analysis and visualisation. The storytelling and the custom dashboards were presented during the evaluation sessions, to demonstrate the capabilities of the URBANITE Platform.

Since the activities for the implementation of the application scenarios involved transversally all the technical work packages, and in many cases also required to interact with the stakeholders of the use cases, a cross work packages meeting involving WP2, WP3, WP4, WP5 and WP6 has been organised, by mutual agreement among these work packages.

On the other hand, for what concerns the evaluation, the evaluation framework has been consolidated; in particular,

- the questionnaire for the collection of feedback about usability, use cases satisfaction degree, and cross department interoperability (the sections of the questionnaire related to use cases satisfaction degree and cross department interoperability have been further aligned to the approach of the SUS methodology, and two additional sentences been included into use cases satisfaction degree section; the aim of these two additional sentences was to further explore aspects related to the “trust” of stakeholders in tools as the ones provided by URBANITE and in the possibility to take decisions based on the information provided by these tools).
- A series of four evaluation sessions has been designed, organised and held in the use cases (one evaluation session per use case); the main aims of the evaluation sessions were:
 - to present the URBANITE Platform and the functionalities implemented for the use case;
 - to establish an open discussion with the participants (e.g., representatives of the local Municipality involved in the management of mobility, and stakeholders of the use case);
 - to collect feedback about the URBANITE Platform and the implemented functionalities;
 - to disseminate the questionnaire for the collection of feedback about usability, use cases satisfaction degree, and cross department interoperability.

To perform the evaluation, during this period, WP6 collected of the information needed for the evaluation of the technical criteria (#1 - URBANITE Features, #2 - URBANITE Requirements Level of Completeness, #3 - Use Cases Requirements, and #4 - Harvested Data sources and their reuse). The required information has been collected in cooperation with the technical work packages (WP3, WP4, and WP5).

For the not technical evaluation criteria (#5 – Usability, #6 – Use Cases Satisfaction Degree, and #7 – Cross Department Interoperability), the above-mentioned questionnaire was leveraged to collect the needed information. Information collected through the questionnaire was further enriched with feedback collected during the four evaluation sessions respectively held between the mid of May and early June in the four cities participating in the project.

For both technical and not technical aspects, the information collected has been analysed, obtaining the final result of the evaluation.

The results achieved during this period have been reported in the deliverable D6.3 “URBANITE use cases implementation-v2” and D6.4 “URBANITE Evaluation-v2”, both produced as part of the activities of WP6.

1.2.6.2 Detailed Work for each task

Task number	Detailed work
T6.1. URBANITE Use cases requirements	This task formally concluded its activities at M12.
T6.2. URBANITE use cases implementation	<ul style="list-style-type: none"> • Keep alignment of technical activities with the implementation of the use cases. • Revision and analysis of the requirements of the use cases. • Implementation of the use cases.; this also included <ul style="list-style-type: none"> ○ the implementation of specific analyses and simulations; ○ verticalization of the URBANITE Platform for the use cases; ○ definition of storytelling ○ implementation of custom dashboards • Writing of D6.3.
T6.3. URBANITE Evaluation	<ul style="list-style-type: none"> • Review of the evaluation framework and evaluation criteria <ul style="list-style-type: none"> ○ Questionnaire per criteria #5, #6, and #7 revised and consolidated. ○ Design of implementation of the evaluation session in the use cases. • Collection of the information needed for the evaluation. • Evaluation of technical criteria • Analyses of the collected information concerning the not technical aspect (criteria #5, #6, and #7) and feedback collected during the evaluation sessions. • Writing of D6.5.

1.2.6.3 Significant results

The main results obtained in this period in WP6 are:

- Implementation of the use cases
- Consolidation of the evaluation framework.
- Design of the evaluation sessions

- Evaluation sessions held in the four use cases
- Evaluation of the achieved results.

1.2.6.4 Main innovations

The main innovations in WP6 are:

- The definition of the four use cases of the project and the relative verticalization of the URBANITE Platform to support the management and planning of urban mobility.
- The evaluation of both technical and not technical aspect of the achieved results.

The main innovation achieved in this period has been:

- Consolidated evaluation framework.
- Verticalisation of the URBANITE Platform for the use cases.
- Specific analyses, simulations, and visualisations for the use cases.
- Storytelling of the usage of the URBANITE platform for the use cases.
- Custom dashboards for the use cases.
- Evaluation of achieved results.

1.2.6.5 Deviation from DoA

Not applicable

1.2.6.6 Failure to achieve objectives

Not applicable.

1.2.6.7 Plan for the next months

Not Applicable

1.2.6.8 WP meetings and/or conference-calls during that period

Thanks to the availability of several meetings organised in the context of the other Work Packages (mainly WP1, WP2, WP3, and WP5) in which aspects related to the implementation of the use cases were debated, it has been decided to not organise specific meetings for WP6. This decision was taken also in consideration of other two aspects:

- Implementation of the use cases was strictly linked to the technical developments in WP3, WP4 and WP5 (concerning WP4, participation of ENG in this Work Package played a connection role with activities of WP6; furthermore, developments of WP4 were also presented and discussed other meetings).
- Avoidance of proliferation of meetings in a short time with no specific updates to discuss.

Due to these reasons, WP6 decided to not organise dedicated meetings.

Topics related to WP6 were discussed in the other meeting mentioned above; in this sense, it is possible to say that WP6 represented the common ground on which activities of the other Work Packages have been carried out, and WP6 as a whole acted as a reference of them.

Specific coordination activities of WP6 have been implemented offline, via email and exchange of documents.

Meeting	Date	Venue	Purpose
-	-	-	-

1.2.6.9 Partners contributions

Next the contributions of the partners participating in this WP are detailed.

TECNALIA

TECNALIA has actively assisted in the definition, design and implementation of the Urbanite Platform Evaluation sessions that have been carried out in the 4 pilot cities.

We have worked together with ENG in the preparation of all the material, organisation of rehearsal sessions focused on the use case owners. TECNALIA has also actively collaborated in the execution of the evaluation sessions with the use case, explaining in detail all the functionalities of the URBANITE platform and establishing fruitful debates about them.

Collaboration and support on the requirements implementation preparing the platform for testing them in the four different environments, tailoring those analytical components implemented in WP4 according to the specific use case scenario, so helping in the definition and realization of the use cases evaluation.

Specifically, for the use case of Amsterdam around bike-happiness in Amsterdam-Noor, in coordination with WAAG and based on infrastructural data from the Fietsersbond, Tecnalia has worked on the estimation and visualization of a safety factor that indicates whether the streets are safe for different type of bikers.

AD

In this WP AD participated in the calls and supported the Municipality of Messina defining the requirements and implementing the use cases.

AD heavily worked on the development of the Messina Edge component guarantying the accomplishment of bridge components with the existing Municipality's ICT platforms. In AD, in collaboration with ENG, worked on the definition, analysis, and design of the advanced functionalities of the use-case. In particular it has been developed the data-analysis tools useful also for the Dashboards of Urbanite, according to the Municipality's personnel roles and needs. It has been also developed the tools necessary to satisfy the requirements of the Municipality. Indeed, during this phase, it was necessary to heavily interact with technicians and decision makers belonging to the Municipality. The tools available, after his validation, were made available on the platform following the directives of the use-case dedicated calls.

The main activities were related to follow up the testing and the fine tuning of the tools. Technically were deployed the Edge Component and the creations of algorithms dedicated to perform the analysis via the edge-component of Messina.

Many meetings were also held to define how the Urbanite platform should integrate the functionalities of other existing tools as well.

In order to obtain good feedback for the project Alma Digit organized many encounters, also the Evaluation Session of the Platform. During the event were collected inputs and feedback for contributing to the D6.3 deliverable. This event involved the technical partners and the local technicians and policy-makers. This made it possible to draw up and finalise the conclusions about the Urbanite project by also evaluating the platform.

Important input was gathered in terms of feedback, future vision or wishes for the drafting of Deliverable D6.5.

MESSINA

The Municipality contributed refining requirements and validating the use case during dedicated calls and meeting. Local policy makers, technicians and other personnel were involved during the meetings in order to collect feedback about the realization of tools integrated into the Urbanite Platform. The Municipality actively participated in WP6 calls and worked hardly with AD in optimization of technical developments. After the activities of requirements collecting about multi-modality, public transportation and vehicular traffic monitoring, areas or starting inputs for developing the first test-cases about traffic monitoring and flows analysis with data from municipal cameras were suggested. Technicians were involved in software development and infrastructures validation (hardware and software).

Regarding the deliverables, the Municipality contributed to D6.3 involving in the activity of feedbacks collection the local policy-makers and technical staff. It was provided a revision of the technical development and description of the activities carried out and next steps planned. Finally, in D6.5 the Municipality finally described their feelings and perception about the work done, the results, the analysis and simulations obtained from the Urbanite platform

ENG

During this period of the project, as leader of the Work Package 6, ENG coordinated the activities of this work package, the contributions of the other partners, and took care of the coordination with the other work packages, to successfully achieve the implementation of the use cases and for the evaluation process.

ENG guided and supported the implementation of the use cases in strict contact with the technical work packages (WP3, WP4, and WP5) and with WP2 (e.g., support the identification of potential recommendations from WP6 perspective and experience).

In particular, ENG verified the requirements of the use cases according to the implementation of the technical activities, guiding the latter on the basis of the requirements.

ENG designed four storytelling (one for each use case) about the usage of the URBANITE Platform and implemented the corresponding custom dashboards. This included:

- the identification of specific requirements of the use cases representing the incipit of each storytelling;
- The identification of user roles (hypothetical users of the platform);
- the identification of datasets available in the URBANITE Platform;
- and related analysis and visualisations;
- the design and implementation specific data analysis;
- the design and implementation of data visualisations;
- the design and implementation of custom dashboards.

ENG presented the four storytelling and the related custom dashboards and the main functionality to demonstrate- the capabilities of the URBANITE Platform during the evaluation sessions held in the use cases.

Concerning the evaluation, ENG revised the questionnaire designed for the collection of feedback on usability, use cases satisfaction degree, and cross department interoperability, making it more coherent with the SUS methodology (on which the usability section of the

questionnaire is based), and added further two sentences according to feedback provided by project partners, with the aim to explore aspects related to the “trust”.

ENG organised (with the support of TECNALIA) the four evaluation sessions held in the use cases; this included the definition, design and implementation of four sessions, and the preparation of the related material. Also, ENG actively executed the evaluation sessions.

ENG analysed the feedback during the evaluation sessions, as well as the answers collected through the questionnaire for the purpose of the evaluation.

To this aim, ENG also took care of the evaluation of the technical aspects (criteria from #1 to #4). With this regard, ENG guided and supported the four use cases, as well as the technical work packages, in the collection of information to evaluate the technical criteria.

Finally, ENG also wrote the deliverables D6.3 and D6.5, coordinating the needed contributions from the other partners.

FVH

FVH’s major role for this task has been to communicate the needs of the city of Helsinki and users’ perspectives to technical development in the WP3, WP4 and WP5 and with WP2 to intertwine more ‘social scientific’ and local, political context into technical development. Also, FVH has helped the stakeholders to increase trust and understanding of novel technologies (e.g. connect to traffic simulations). FVH’s work has helped to steer the direction of URBANITE ecosystem work.

FVH has been actively involved in the implementation of the ecosystem by bringing local context, users’ needs and local technical requirements (e.g. the city’s LIDO project) into discussion with tasks and deliverables (T6.2 & D6.2) but also with KRs. FVH also has advanced the progress of URBANITE ecosystem (WP5) and evaluated its functionality together with stakeholders to ensure its effectiveness, functionality and relevance (T6.3 & D6.3). In order to increase trust towards the ecosystem and new technologies, FVH has organised several meetings with the stakeholders and communicated the functionalities and features of the platform and new technologies. FVH has brought together differing needs of the case Helsinki, and created from it a common approach that is helping to understand traffic in Helsinki and Jätkäsaari better, helping to understand micro-level actions and alleviating possible insecurities to use disruptive technologies.

JSI

JSI contributed by providing updates and fixes to developed components in accordance with the users’ feedback. The developed tools have been demonstrated to the users to facilitate the users’ own exploration of the ecosystem. Several points of friction have been identified during testing with users, solutions have been discussed and implemented when possible.

D6.3 (URBANITE Use cases implementation v2) includes contributions from JSI on use case specific simulations and functionality, description of tools developed. D6.5 (URBANITE Evaluation v2) includes contributions from JSI in reporting status of requirements, providing information about features of developed modules and about use case specific functionalities and requirements.

WAAG

WAAG contributed further to T6.1, T6.2 and T6.3, where we supported the Municipality of Amsterdam and other partners in finetuning the use cases.

In Amsterdam, together with the Municipality of Amsterdam, we further aligned the use cases with the second SoPoLabs and reviewed the use cases on the basis of available data. A plan is drafted to execute the use cases in Amsterdam. We did so through the co-creation sessions of SoPoLab 2, conversations with stakeholders and the municipality and desk research.

The logbook drafted by WAAG and Tecnalía for WP2 assist in T6.3: collecting results from WP2. These steps contribute to the definition, execution and evaluation of results.

Besides, WAAG executed the internal review of D6.2.

AMST

AMST contributed to T6.2 and T6.3.

In T6.2 the activities consisted in: gathering data sources; liaising with relevant stakeholders both internally and externally; several stakeholder sessions with communities, SMEs, NGOs and IGOs; organising and coordinating Amsterdam city team with 4 programmes and departments: several meetings, reviewing policies.

In T6.3 AMST participated to the definition of the evaluation methodology and in the evaluation and follow up.

AMST organised several meetings with stakeholders, like SMEs, not-for-profits and civil servants. Also attended several meetings to share the experiences with Urbanite and make a short film on data collaborations as a disruptive technology.

BIL

BIL mainly contribution has been to facilitate the implementation of the Bilbao use case, providing the framework for the validation of URBANITE tools developed. BIL has tested the project developments providing feedback on different aspects as usability, user interface, potentiality...

MLC

MLC has participated in WP6 periodic meetings and supported Bilbao in the implementation and validation of the URBANITE ecosystem. MLC has also contributed to deliverables D6.3 and D6.5 submitted within this period.

1.2.7 Work package 7 - Sustainability and awareness

1.2.7.1 Summary of work progress and achievement during the period

The main objectives of this work package are:

- To disseminate and communicate the project concept, developments and findings both towards the scientific community, the wider public and identified stakeholders (i.e. industry, academia, Public Authorities).
- To collaborate with other European projects in the relevant topics of URBANITE.
- To participate in appropriate European and worldwide events (workshops, seminars, conferences, etc.).
- To address the future adoption and ensure the sustainability of the project results taking into account the market trends, the business scenarios and the consortium and partners' needs and strategies.

During this period, the activities performed in WP7 mainly focused on:

- The application of the dissemination, communication and networking plan, which included the organisation of the URBANITE final event, the participation in events, submission of papers, the management of the social network account and project website, the preparation of videos and other dissemination and communication material.
- Update of market trends, competitors' analysis, SWOT analysis and innovation potential etc. and the preparation of the potential business model for URBANITE and the related scenarios.
- Preparation and delivery of the Joint Exploitation plan.
- Update of the partners' individual exploitation plans and strategies.
- IP management.

1.2.7.2 Detailed Work for each task

Task number	Detailed work
T7.1. Dissemination	<ul style="list-style-type: none"> • URBANITE has been presented in the following events: <ul style="list-style-type: none"> ○ DataWeek 2022. Online workshop regarding Disruptive technologies empowering decision-making in the public sector (25th May 2022). ○ European Week of Regions and Cities (11th Oct 2022) presenting innovative tools and practices for citizens, urban planners and policy-makers supporting the building of smarter cities. ○ URBANITE Final Event: an interactive Workshop (90 minutes) titled "Urbanite & OASC: open source for communities/data spaces for smart cities & communities/disruptive technologies adoption for a data-based policy making process" at the OASC- Open & Agile Smart Cities Annual Summit & General Assembly, on 14th June 2023 in Brussels, Belgium. • Urbanite has been presented at the following conferences: <ul style="list-style-type: none"> ○ III Edition GO MOBILITY #GoMobility2022 by MUBIL (27-28th April 2022) ○ Information Society 2022 Multiconference (11th October 2022) ○ Smart city expo en Barcelona (15-17 Nov 2022) ○ CCGRID 2022, 22nd edition IEEE/ACM international conference in MESSINA (16-19th May 2022) ○ XXIII Spanish ITS Congress / V Iberoamerican (LATAM) ITS Congress. IBES (Seville) (28-30th March 2023) ○ DataWeek 2023. F2F Participation in the session "Participatory Data for Innovation" (13th June 2023) ○ POLIS Conference. Describing the work on data analytics. (Sep 2023) • Attendance to several events: <ul style="list-style-type: none"> ○ Disruptive Technologies for Public Administration (21st April 2023) ○ MIT Mobility Forum (Spring 2023) (5th May 2023) ○ Webinar: La Logística y las Smart Cities (6th Dec 2022) ○ INNOVATION LAB Proyectos Innovadores para alcanzar una la Logística Urbana 4.0 (LOGISTOP). (4th May 2023) ○ European Commission guidance on use of models in policymaking Launch Event. (19th June 2023)

Task number	Detailed work
	<ul style="list-style-type: none"> ○ Public workshop of EU H2020 ALIGNER -Police and Law Enforcement Agencies to bring AI safely and effectively into their service. Implications of the forthcoming EU AI Act. (22nd June 2023) ○ OASC Annual Summit & General Assembly 2023. (14th June 2023) ○ Brussels Urban Summit 2023, participation. (13-15th June 2023) ○ Open seminar: AI in public services – social, ethical and legal implications.(27th June 2023) ○ Workshop: “AI, Regulation and Decision Making”. CNRS & ENS-PSL. (27th June 2023) ○ 3 Journal and scientific papers (details can be found in D7.5. Table 6) ● 18 Conference papers (details can be found in D7.5. Table 8)6 Non-scientific with a more general or business view, however, they still contribute to raising awareness about the project URBANITE, both nationally and internationally
T7.2. Communication and Networking	<ul style="list-style-type: none"> ● 3rd brochure preparation and creation presenting the tools that have been developed to transform urban mobility data into usable information. ● Prepared a pair of reference posters, including a brief and a more detailed description of the developed methods and main decision-related functionalities. They were presented at the Final Event in Brussels, last 14th June of 2023. ● Maintain the project website updated. ● Published 20 blog posts (blog entries posted on the website). ● Project website behaviour monitoring ● Prepared a new version of the newsletter ● Several videos were prepared, subtitled and shared on the youtube project channel: <ul style="list-style-type: none"> ○ Use case videos, introducing the needs, challenges and opportunities from the mobility perspective (Amsterdam and Messina). ○ Messina’s General Assembly video, with participation of the different partners and a view of the use cases. ○ Technical supporting material for data analytics and dashboards management. ● Future plans for dissemination strategy definition. ● Monitoring and evaluation of all the KPIs related to dissemination and communication. ● Periodical twitter account population and impact analysis. ● Linked communication promotion adopting the strategy of participating individually in relevant forums, promoting the project knowledge and attracting new followers, and specialists in the field if they express interest. ● Presentations added to the SlideShare account: <ul style="list-style-type: none"> ○ Future Mobility Day - URBANITE.FI-WARE's Future Mobility Day (German) URBANITE, Decision making in the urban transformation field using disruptive technologies and a participatory approach.

Commentato [Ug28]: TECNALIA can you please update this?

Commentato [UCI29R28]: We have completed a first version based on D7.5

Task number	Detailed work
	<ul style="list-style-type: none"> ○ Data-driven cities: digital technologies for inclusive and sustainable decision-making processes. ○ Dataweek-2023-participatory-data-for-innovation-urbanite DataWeek 2023 Participatory data for innovation, presentation around data. ○ Presentation for the final event (OASC Annual summit). ● Communication kit updated including the use case descriptions to provide real application examples. ● Networking activities: <ul style="list-style-type: none"> ○ Collaboration with other projects, from a technical collaboration, co-organization of events, joint dissemination to a shared working group. ○ Networking assessment and evaluation ● Future networking plan definition ■ After the submission of the report D7.5, a new brochure and a presentation have been publicly available.
T7.3. Market, Innovation and Applicability Analysis	<ul style="list-style-type: none"> ● Updated SWOT analysis, competitor analysis and the analysis of market trends and gaps
T7.4 IPR Management, Exploitation strategy and Sustainability	<ul style="list-style-type: none"> ● Finalised the Joint Exploitation plan related to the creation of the Urbanite Alliance ● Analysed Costs and potential Revenue streams for URBANITE ● Performed URBANITE scenarios analysis. ● Finalised the Business Model ● Managed IP ● Prepared the final Individual Exploitation plans

1.2.7.3 Significant results

The main results obtained in this period in WP7 are:

- Dissemination, communication and networking activities performed.
- Organised a final communication event.
- Released new version of dissemination and communication material (e.g. brochure, newsletter and press release).
- Released the Business Model for URBANITE including cost analysis and the analysis of potential revenue streams in different URBANITE forecasting scenarios.
- Finalised the Joint Exploitation plan and the draft agreement for the creation of URBANITE Alliance.
- Seven partners have signed the Letter of Intent to continue the activities for the creation of the URBANITE Alliance after the project end, i.e., ENGINEERING, TECNALIA, FRAUNHOFER FOKUS, WAAG, MLC, ALMADIGIT and JSI.

In addition, two deliverables have been submitted:

- D7.5 Dissemination, communication and networking report-v3;
- D7.9 URBANITE IPR Management, Business Models and Business Plan-v3.

Commentato [Ug30]: @Sonia, I don't if we should include or not JSI in this report. We didn't attach the JSI Letter of Intent in the D7.9. We received it two days ago.

1.2.7.4 Deviation from DoA

No deviation.

1.2.7.5 Failure to achieve objectives

Minor divergences with respect to some specific KPIs: references from external pages, number of followers, visit times for communication activities; the joint development of a technical assets or joining training, Although, some of these indicators had been proposed internally in the project, as part of the WP7 plans.

1.2.7.6 Plan for the next months

For the next months, the partners have signed a Letter of Intent to confirm their intention to collaborate after the project end setting the basis for the creation of the collaborative URBANITE ALLIANCE for joint exploitation of URBANITE's Key Exploitable Results. Each partner has also developed individual exploitation plans and strategies.

1.2.7.7 WP meetings and/or conference-calls during that period

Until the month of March 2022 a specific WP7 call was scheduled once a month, it was then decided to dedicate specific time for planning and update of WP7 during the bi-weekly call as one representative per partner was present this resulted in a more efficient and effective planning of the time spent to share among all partners activities, results and plans.

Meeting	Date	Venue	Purpose
WP7 Call	15/11/2022	online	Update and planning
WP7 Call	04/10/2022	online	Update and planning
WP7 Call	06/09/2022	online	Update and planning
WP7 Call	12/07/2022	online	Update and planning

1.2.7.8 Partners contributions

Next the contributions of the partners participating in this WP are detailed.

TECNALIA

Tecnia is leading the task related to communication and networking strategy for the project. Tecnia maintains and develops the website of the project, uses social media channels to disseminating results and has used Google analytics to monitor its activity. Also, different social networks, like LinkedIn and mainly Twitter, present analytical tools to measure the impact of the project also used in URBANITE.

Tecnia has been in charge of the communication materials: the 3rd brochure, has been created by Tecnia with contents from other partners and the different presentations. The third brochure of URBANITE presents the tools that have been developed within the URBANITE project to transform urban mobility data into usable information. A pair of posters have been prepared, published and presented at events, also several blogs and the different press releases, translated to other languages by the rest of the consortium and a set of technical videos of the specific analytical techniques for each of the use cases.

Together with ENG, Tecnia co-organized different collaboration sessions with other projects, such as the workshop in the DataWeek 2022 and the workshop on the European Week of Regions and Cities on 2022. Supported by ENG and the use case owners, Tecnia organized the URBANITE final event in Brussels under the umbrella of the OASC Summit and General Assembly

Commentato [UCI31]: Based on table 1, D7.5 and D7.9 were submitted in M40 instead of M39, would it be possible to analyse and check this information?

Commentato [FP32R31]: D7.9 was submitted on the 21 of July

Commentato [VM33R31]: D7.5 was submitted on the 9th of July, @JSI @ENG could you please add them and justify the deviation from the Amendment?

Commentato [Ug34]: to be checked according to how the signature of the letter of intent goes

in Brussels. Also, represented URBANITE at the DataWeek 2023 session on “Participatory Data for Innovation”, Smart city exp and GO MOBILITY, the last in Spain.

Some scientific papers have been submitted of the topics of forecasting models and confidence. Tecnalia tracked the different KPIs, also those related to dissemination, also identifying the most relevant event, conferences and journeys, and the co-leading and writing of D7.5 summarising the activities during this third period.

Tecnalia has established and kept the contact with other projects in order to collaborate with different objectives: common dissemination activities, workshops or knowledge and result sharing: HECAT, ATELIER or ODALA Concerning the exploitation, Tecnalia has worked with ENG on the preparation of D7.9, more specifically on the update of the DAFO, the deployment costs estimation, the analysis of the licensing schemas of the IPs and the whole platform and the URBANITE Alliance approach and agreement. The contributions are included on D7.9.

Tecnalia participated in the calls of this WP.

AD

Alma Digit participated in WP7 meetings. AD helped the consortium in the communication and dissemination activities of the in-progress and finals Urbanite results. AD assisted the Municipality of Messina with the organization of 8th General Assembly, also contributing to dissemination activities related to the event, in its social networks and official portal. In particular Alma Digit (AD) posted on Social Network channels (Facebook, Twitter, LinkedIn) also for the promotion of SoPoLab events, producing blog-post about SoPoLab and co-creation activities and also the results of Urbanite in the evaluation session. In addition, Alma Digit and the Municipality of Messina has contributed to the communication through the publication of scientific papers and dissemination activities participating in several international events such as IEEE CCGRID in Taormina (IT), Digiplace meeting in Romania, DataWeek (online event) OASC event in Brussels with other partners.

MESSINA

The Municipality of Messina participated in wp7 calls and supported the partners in the different activities. The Municipality, with the support of Alma Digit, hosted the 8th General Assembly of the project also contributed to the dissemination about the GA event with activities of communication such as videos, post on social-network channels and official sites of the Municipality of Messina. Moreover, the dissemination activities of the Municipality concerned SoPoLab events, producing blog post with Alma Digit about co-creations activities and with the participation in international events the URBANITE project: IEEE CCGRID in Taormina (IT), Digiplace meeting in Romania, DataWeek 2022 (online event).

ENG

ENG, as leader of the WP, has coordinated the overall activities supporting partners in reaching the WP objectives. In the third year ENG has worked mainly on dissemination and communication activities, reviewing the content of communication material, supporting blog post production, managing and nourishing the relationships and the connections with relevant networks like BDVA, FIWARE and OASC. ENG has also ensured collaboration with other projects working towards similar objectives like DECIDO and URBANAGE projects. It has organised, in cooperation with TEC, a session on “Disruptive technologies empowering decision-making in the public sector” which took place during for DataWeek 2022 on 25th May 2022 and saw URBANITE team collaborate with URBANAGE, DECIDO, and POLICYCLOUD project teams. ENG also supported the organisation of the workshop “Data-driven cities: digital technologies for inclusive

and sustainable decision-making processes” which took place as part of the European Week of Regions and Cities on 11th October 2022. ENG supported TEC in the organisation of URBANITE final event which took place at the OASC - Open & Agile Smart Cities Annual Summit & General Assembly, on 14th June 2023.

Together with the management of the blog post-delivery and the review of the contributions provided by each partner, ENG has prepared, in the third year two blog posts:

- One on the use of dashboard in URBANITE project - <https://urbanite-project.eu/content/custom-dashboards-%E2%80%93-practical-example-0>
- One on the participation in workshop at the European Week of Regions and Cities - <https://urbanite-project.eu/content/european-week-regions-and-cities>

ENG also prepared a video to guide users through the dashboard creation process which is available on URBANITE Youtube channel at the following link: [URBANITE Dashboard Creation Process](#).

During the third year ENG has also worked on the identification of the Joint Exploitation plan. The team updated the elements of the business model such as customer analysis, competitor analysis, the analysis of market trends and performed a thorough analysis of the potential marketability of the URBANITE solution. The analysis included the investigation of potential key customers to identify and classify them. According to the results a business model was defined, selecting or combining both subscription, hybrid, and value-added service models. The main cost components of the URBANITE Ecosystem were identified and estimated. Once all the costs were identified, classified, and allocated, an analysis was conducted to assess the structure of the revenue model and the impact of the overall costs. The analysis of revenue streams and pricing models was performed on the basis of three different scenarios according to the potential customer’s characteristics and the relative business model. ENG has also guided partners in the management of IPs by maintaining the IP registry.

FVH

FVH has actively participated in WP7 calls organised by ENG. FVH has played an active role in the WP7, working closely with stakeholders, effectively communicating the project, and disseminating the developed URBANITE ecosystem. FVH has contacted the stakeholders in formal and more informal meetings. FVH's dedication to these tasks has allowed to actively engage with stakeholders and create widespread awareness of the project.

By actively involving stakeholders from different mobility sectors, FVH has fostered a sense of ownership and commitment, resulting in a more inclusive and effective URBANITE ecosystem.

FVH has written a blog post and used social media platforms (Twitter, LinkedIn) to raise awareness about the topic. Blog post was concentrating on social perspectives of traffic simulations, which could be seen as a continuation to the earlier blog post focusing on traffic modelling.

FVH has participated in the OASC Brussels Urban Summit 2023 and OASC General Assembly meeting, where URBANITE’s final event was organised in the 14th of June.

FhG

FhG has actively participated in WP7 calls and contributed to WP7 in numerous ways:

- Presentations and workshops were held about URBANITE.

- Organisation of an Urbanite workshop for Fraunhofer colleagues
- Publishing a blog article

JSI

A pair of scientific papers and some conference works have been submitted around the application of Machine-Learning Techniques to mobility policy proposals. JSI co-led the writing of deliverable D7.5 (delivered in M39).

WAAG

WAAG contributed to several tasks of this work package aimed at disseminating the results of the project. Besides, WAAG created a blog about Social Policy Labs: <https://urbanite-project.eu/content/exploring-potential-mobility-data-commons-amsterdam>.

AMST

AMST contributed to several tasks of this work package aimed at disseminating the results of the project by sharing info internally with stakeholders and externally with potential partners.

Urbanite is on Open Research: <https://openresearch.amsterdam/nl/page/75535/data-commons-in-smart-mobility>.

AMST organised a data collaborations ‘start’ event on Thursday 9 March –with 20 people, sharing the Urbanite platform and Telraam sensor, and making a short movie about collaborations on data (data commons) as a disruptive technology.

On April 13 2023 50 people participated during an Economic Board event where AMST explained about Urbanite and the Amsterdam data commons approach.

Urbanite was referred to by a city council member as an ‘example’ project in which citizens were well involved, see: [agendapunt 11](#).

Also it was discussed at the staff of the city council of Amsterdam-Noord (with Yasmine el Ksaihi) and also with the ‘college van burgemeester en wethouders’): all city alderman and the mair and during several meetings of the innovation team, bike team and the data team.

We are planning a last event in September, also sharing the latest update of the platform.

BIL

BIL has contributed to disseminate project activities within its organization by creating internal awareness of the project involving personnel different areas and engaging other municipal entities in the project as the IT municipal company, the public transport operator...Bilbao has also participated in the preparation of a video regarding the Bilbao Use Case. BIL has also contributed to the presentation of URBANITE and Bilbao use case in some events of reference (Spanish ITS Annual Congress)

MLC

MLC has widely disseminated project activities within its network by engaging external stakeholders in the participation of the SoPoLabs and in the presentation of the Bilbao use case. MLC has presented URBANITE general objectives and specific Bilbao use case and tool in the XXIII ITS Congress Spain and V ITS Congress Latin America celebrated in Sevilla from the 28th to the 30th of March 2023. Besides MLC presented a paper about URBANITE that was accepted for

the POLIS Annual Conference to be celebrated in Leuven 29th – 30th November 2023. MLC has also contributed to the URBANITE's website updates related to Bilbao use case.

1.2.8 Work package 8 - Ethics requirements

1.2.8.1 Summary of work progress and achievement during the period

The main objective of this work package is to provide general guidance concerning ethical issues of URBANITE project, supporting the consortium with an ethical and privacy approach along the different activities.

During this period, ethical issues were monitored in the preparation, activities and results from the SoPolab sessions and the data managed for the use cases, exploring the applicability and impact of dealing with :

- The **transfer of collected data from 3rd parties**, defining a transfer agreement among both parties (company and city use case): Ring-Ring (AMS). Telraam (AMS)
- The potential **use of existing personal data** on the cities to the objectives of the project: Mesm@rt (MES), Video cameras for counting vehicles (Edge) (MES), Eurostats (All), Public bike rental (BIO/MES), O/D Matrix (WiFi based) (BIO)

As reported on the proposal the URBANITE platform is not gathering personal data, in any case the privacy related issues were under analysis.

1.2.8.2 Detailed Work for each task

WP8 only has one task. During this period (M25-M39) we have continued to monitor the ethical issues of URBANITE project.

1.2.8.3 Significant results

The main results obtained in this WP8 are:

- Follow up of the process to manage the ethical and privacy issues of the project.
- Tackle diverse ethical (mainly privacy related) related to the additional datasources
- Application of data privacy and security measures, collecting all the needed documentation.

1.2.8.4 Main innovations

Nothing to report.

1.2.8.5 Deviation from DoA

Nothing to report.

1.2.8.6 Failure to achieve objectives

Nothing to report.

1.2.8.7 Plan for the next months

The main activities to be performed after the end of the project are to continue providing general guidance concerning ethical issues of the gathered information once the project officially ends.

1.2.8.8 Partners contributions

TECNALIA as coordinator of the project, has monitored the different activities of WP8.

ALMA DIGIT, MESSINA, MLC, BILBAO, FVH, AMS and WAAG, as managers of the different SoPoLab sessions and use cases, have applied the data privacy and security measures, collecting all the needed signed policies, consent forms, and agreements.

2 Updated Data Management Plan

The most relevant updates on the Data Management Plan are the aspects related to the ethical and privacy issues around data. The description of the relevant data-sources to be considered, gathered, processed and generated is in continuous progress, aligned with the refinement of the different use cases.

Specifically, the concept of Data Ethics has been explored, by analyzing different frameworks and initiatives, that include different information from indicators, and guidelines to whole capability or maturity models to recommendations for organizations involved on a data-sharing process. After a selection, the tables summarizing the data-sources finally adopted by the use cases, including the most relevant information: meaningful, openness/closeness, usefulness for the algorithms and processes and additional information from such data ethics model.

3 Updated Ethics-related Deliverables

Accordingly, the Ethics requirements assessment scope, URBANITE tackled diverse ethical issues, like:

POPD - Protection of Personal Data- Requirement No.2: the protection of personal data is linked to both ethical requirements no. 1 and no. 2.

Regarding the analysis of legislative and/or regulatory gaps associated with the URBANITE project, the following main regulations have been analysed in relation to the potential data sources just mentioned:

- Regulation (EU) 2016/679 of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data (GDPR).
- Regulation (EU) 2021/695 of 28 April 2021 establishing Horizon Europe – the Framework Programme for Research and Innovation, laying down its rules for participation and dissemination, and repealing Regulations (EU) No 1290/2013 and (EU) No 1291/2013.
- Ethics By Design and Ethics of Use Approaches for Artificial Intelligence EC 2021.
- European Commission' Ethics Guidelines for Trustworthy AI'.
- Guidelines 01/2020 on processing personal data in the context of connected vehicles and Mobility related applications. European Data Protection Board Version 2.0 Adopted on 9 March 2021.
- Guidelines 3/2019 on processing of personal data through video devices. European Data Protection Board Version 2.0 Adopted on 29 January 2020.
- Directive 2002/73/EC on the implementation of equal treatment for men and women as a guideline for, e.g., access to employment, vocational training, and promotion, and working conditions.
- Charter of fundamental rights of the European Union (2012/C 326/02).

POPD - Requirement No. 6. Related to the description of the security measures that will be implemented to prevent unauthorized access to personal data or the equipment used for processing, in this case for the management of Eurostat microdata.

4 Update of the plan for exploitation and dissemination of results

The final results regarding the business model analysis and the related exploitation strategies both at consortium and partner levels are provided in D7.9 URBANITE IPR Management, Business Models and Business Plan-v3. In particular, the update related to: 1) the analysis of the project key results, targeted customers, cost and revenue models, the value proposition, and the innovation potential; 2) the SWOT analysis of each key result looking into their strengths and weakness and the possible opportunities and threats coming from the outside world; 3) the analysis of market trends and gaps and the analysis of competitors; 4) analysis of exploitable assets and IP; 5) the URBANITE forecasting scenarios and their results; 6) the partner exploitation plans; 7) the analysis of the Open-source strategy.

As explained on section 1.2.7, six partners have signed the Letter of Intent to continue the activities for the creation of the URBANITE Alliance after the project end, i.e., ENGINEERING, TECNALIA, FRAUNHOFER FOKUS, WAAG, MLC, ALMADIGIT and JSI (the last, after the deliverable submission). This signature expresses the intention of collaboration to assess the creation of joint initiatives that would exploit the results of URBANITE. These results aim to provide a model supported by methodologies, data and algorithms for data-driven decision-making in urban transformation. The Key Exploitable Results are the URBANITE solution (KR5) to support administrators and local authorities, the SoPoLab (KR1) to bring together collaboration among all stakeholders, the Data Management Platform (KR3), the Decision-Support System (KR4), and the Recommendations and Pathways results (KR2) as guidelines for public administrators. The Joint Exploitation Agreement would regulate the rights, responsibilities, and obligations for each partner beyond the project schedule.

Specifically, the draft for the joint exploitation identifies some potential responsibilities:

- i. Links with other organisations within and outside Europe in order to:
 1. Foment the use of the ALLIANCE Controlled IP and the Open-source Project
 2. identify possible strategic alliances with other organisations for future deployment.
- ii. Co-ordinate dissemination actions.
- iii. Control the use of the ALLIANCE Controlled IP.
- iv. Enforce the terms of the Exploitation Agreement.
- v. Manage IPR and propose usage agreements between the ALLIANCE Members for the use of the ALLIANCE Controlled IP.

The next step will be the the closing of the agreement between the interested partners, including the details and work plan.

On the other hand, with OASC and FiWare initiatives, potential collaborations and sharing of source code were identified and a further analysis, both technical and in terms of licensing schemes is needed.

A new opportunity of collaboration with the project EIT Manufacturing FLEXMAN on data-based-decision making is being explored. This project is based on a learning path which includes

manufacturing SMEs and experiential learning and consultancy by technological experts. In the short, general awareness and later, potential sharing of experiences with disruptive technologies on different use cases and explore cross-domain approaches.

MLC will present a paper about URBANITE that was accepted for the POLIS Annual Conference to be celebrated in Leuven 29th-30th November 2023.

Finally, Tecnalía is preparing a fourth press release at the national or regional level, in the form of an interview or dedicated report on the potential of URBANITE key results.

5 Deviations from Annex 1 and Annex 2

As explained throughout this report, all the objectives and challenges of the project have been satisfactorily met by extending the project for 3 months. As proof of this, the four milestones have been successfully completed without minor delays in some deliverables (D1.5, D1.6, D2.5, D3.6, D4.4, D4.6, D7.5 and D7.9).

5 Tasks

Most of the tasks planned for M25-M39 of the project and the related objectives have been fully achieved as per the project plan and the time baseline, with the exceptions explained above for some deliverables.

5 Use of resources

Effort report

The effort that the project has spent from M25 to M39 period is **223,29** PMs, versus the estimation (remaining effort con respect al DOW) of 141 PMs or the 177 PMs that would be obtained according to a linear approximation between the three reporting periods. The figure below shows the effort spent in person-months per partner in every WP in the reported period (M25-M39).

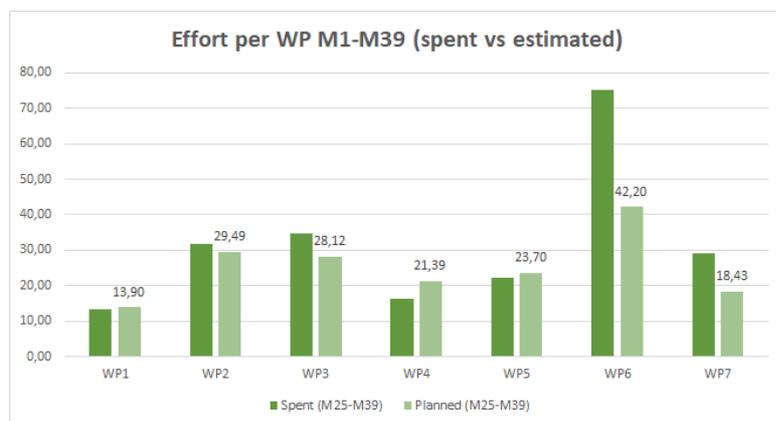


Figure 1. Comparative between the effort spent with the total planned for the whole project

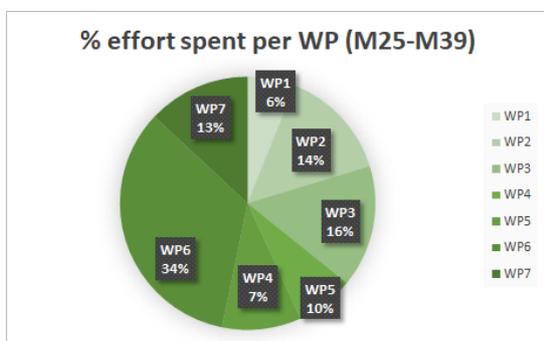


Figure 2. Percent of spent cost per WP (M25-M39)

The evaluation of dedication per workpackage throughout the project is adjusted to the following graph. In this third year, at a technical level the activities of component completion (WP3/WP4), integration (WP5) and parameterization and deployment in the different use cases (WP6). The activity in WP2 has been mainly associated with the completion of the latest SoPoLabs and the preparation of the D2.6 deliverable corresponding to the conclusions, recommendations and impact. Likewise, WP7 has had relevant activity this last period due to the most active activity in the areas of dissemination and communication, including the organization of the final event, as well as the completion of activities around the future exploitation of results and models. underlying business. This distribution adjusts to the deviation of these work packages, with respect to a linear forecast of progress.

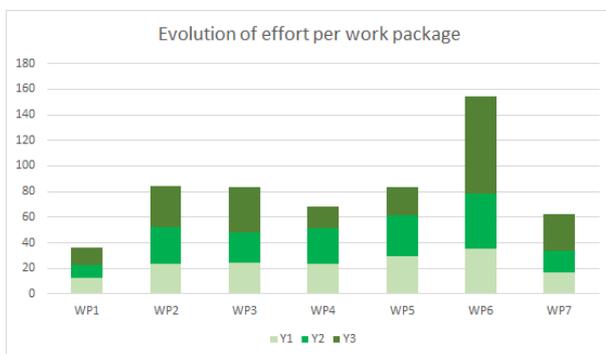


Figure 3. Evolution of the effort per work package along the project

Analysing the dedication per partner in this period, they correspond to the activities previously mentioned.

Table 4. Spent effort (PMs) per partner in M25-M39

	Y3 (M25-M39)											
	TEC	AD	MESS	ENG	FVH	FgH	JSI	WAAG	AMST	BIL	MLC	Total
WP1 Actual	5,95	0,9	1,55	1,6	0,62	0,75	0,25	0,45	0,4		1,05	13,52

WP2 Actual	4,38	1,36	2,16	5,59	4,31	0	0	11,01	1,27	0,42	1,25	31,75
WP3 Actual	8,73	0,3	2	2,59	0	20,95	0		0	0,22		34,79
WP4 Actual	4,69	1,1	1,4	0,64	0	0	8,6		0			16,43
WP5 Actual	8,67	0,92	1,1	4,98	1,66	3,89	0,67		0	0,5		22,39
WP6 Actual	7,09	8,6	4,4	8,23	8,47	0	7,22	12,85	5,68	7,03	5,78	75,35
WP7 Actual	2,73	2,9	3,85	4,31	0,97	2,01	4,76	3,26	0,39	1,17	2,71	29,06
WP8 Actual												
Total M25-M39	42,24	16,08	16,46	27,94	16,03	27,6	21,5	27,57	7,74	9,34	1	223,29

Table 5. Spent effort vs. Planned effort in M25 – M39

	Spent effort vs. Planned effort in M25 – M39											
	TEC	AD	MESS	ENG	FVH	FgH	JSI	WAAG	AMST	BIL	MLC	Total
WP1 Actual	5,95	0,9	1,55	1,6	0,62	0,75	0,25	0,45	0,4		1,05	13,52
WP1 Planned	12,69	0,67	0,67	1,3	0,33		0,34	0,45			0,66	17,11
WP2 Actual	4,38	1,36	2,16	5,59	4,31	0		11,01	1,27	0,42	1,25	31,75
WP2 Planned	12,72	0,82	0,82	5,6	2,2			7,01			0,82	29,99
WP3 Actual	8,73	0,3	2	2,59	0	20,95			0	0,22		34,79
WP3 Planned	17,71	0	1,2	1,67	0						0,2	20,78
WP4 Actual	4,69	1,1	1,4	0,64	0	0	8,6		0			16,43
WP4 Planned	5,3	0	0	0,46	0		8,2					13,96
WP5 Actual	8,67	0,92	1,1	4,98	1,66	3,89	0,67		0	0,5		22,39
WP5 Planned	4,6	0,36	0	3,72	0,2		2,72					11,6
WP6 Actual	7,09	8,6	4,4	8,23	8,47	0	7,22	12,85	5,68	7,03	5,78	75,35
WP6 Planned	0,92	6,67	3	6,04	4,33		2,66	7,85			3,34	34,81
WP7 Actual	2,73	2,9	3,85	4,31	0,97	2,01	4,76	3,26	0,39	1,17	2,71	29,06
WP7 Planned	1,95	1,67	2,33	3,04	1,33		1	3,255			1,34	15,91
WP8 Actual	0	0	0	0	0	0	0	0	0	0	0	0
WP8 Planned		0	0	0	0	0	0	0	0	0	0	0
Spent M1-M39	42,24	16,08	16,46	27,94	16,03	27,6	21,5	27,57	7,74	9,34	10,79	223,29
Planned M1-M39	55,89	10,19	8,02	21,83	8,39	0	14,92	18,565	0	0	6,36	144,165

The deviations are explained below:

The use of resources for Waag is roughly in line with budget estimates, with the exception of WP2 and WP6. Aligning policy contexts and use cases (both in the Waag supported Amsterdam pilot as in general aligning WP2 with WP6), required the establishment of a decision-making processes, developing a shared and joint view of context, and research questions within framework of the specific tasks. Obviously, this was challenged by a lack of in person contact due to pandemic situation. In addition, a continued effort was needed to reach out to and engage domain specialists both at the various municipal departments involved in urban, mobility, innovation policy and development as well as communal organisations, SMEs and NGOs involved in bike policy and bike data collection. Compared to initial budgets estimates, on average, the team at Waag was more junior compared to the initial budget. This is reflected in increased use of person months."

FVH has dedicated more person months to the project than expected since the hired personell was more junior than assumed. Due to this, FVH has had less costs than expected, with more PMs. The aims of the project are met as planned. FVH has used more PMs to WP5 and WP6 during the year 3 than planned. Mediating the users' perspectives on the technical development (esp. Traffic simulations as part of the the ecosystem) (WP5) and planning the usage of the platform after the project from a technical perspective (WP5) has continued later than planned. WP6 and WP2 have required more resources than planned as the communication with the stakeholders has been active, especially during the end of the project (WP6).

TECNALIA has dedicated less effort than initially planned due to parental and health leaves of some of the staff and the dedication of more experienced experts to mitigate these absences, actually most of the researchers involved in URBANITE are senior. These more experienced experts required less time to execute the work but at a higher cost rate. Furthermore, TECNALIA has an important dedication in WP3 where, however, the ingestion of pending data, and the absence of important evolutions at the architectural level, has not required additional efforts than planned. However, as responsible for the integration of the components and the development, integration and production environment, the extension of the project and the final integration of the components, under continuous evolution, has required more time than expected, with high dedication of several people of the team. Finally, participation in WP6 has been higher than expected; according to the initial plan, the support was going to be for the Bilbao pilot, but specific functionalities have also been addressed such as the calculation and visualization of the Safety Index for bicycles in the case of Amsterdam, and support has also been given to the parameterization of different replicated components. between cities. Finally, in WP7 a greater effort has been necessary to prepare the different communication materials and participation in dissemination, communication and analysis activities for the subsequent exploitation of the project.

JSI has done an additional effort on the development and tailing to the different use cases of different components of WP4 and integrating them in URBANITE ecosystem. The work in JSI has been done by junior researchers which PMs have lower costs than the initially planned senior researchers.

Summarizing the accumulate, shows the percentage of the effort spent in each WP with respect to the total effort spent in the project, whereas **Figure 4**. Percent of effort spent per workpackage along the project shows the percentage of the accumulated effort spent up to now during these two years in each WP with respect to the total effort.

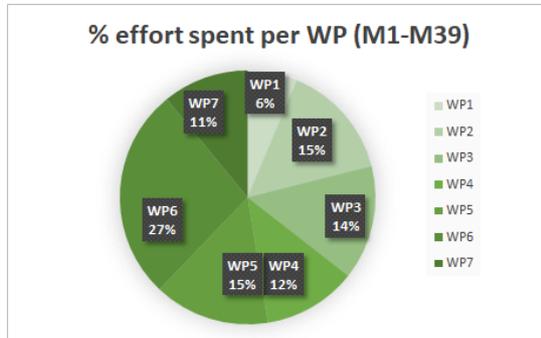


Figure 4. Percent of effort spent per workpackage along the project

This provides a reference of how the resources have been distributed during the project. As expected, main effort has been dedicated in WP5 and WP6 where the URBANITE requirements, architecture and scenarios have been defined, integrated together, parametrized and deployed supporting the different use cases.

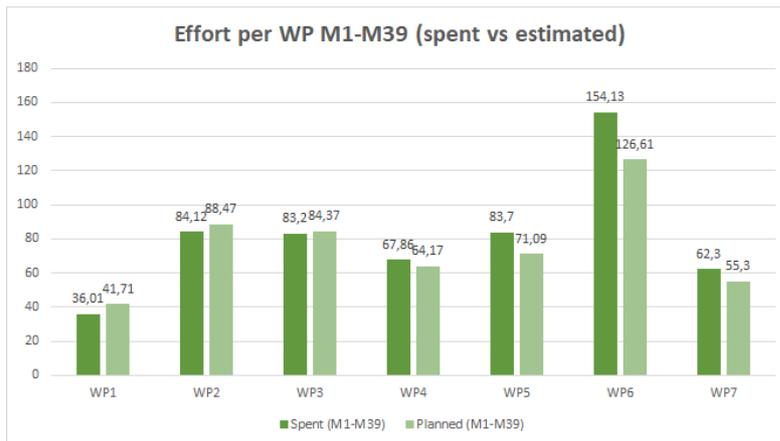


Figure 5. Comparative of effort spent and estimated per work package along the project

Analysing the divergences with respect to the planned effort (shown on the DOA), the main deviations are due to the problems found during the development of some of the components, which have led to subsequent phases of integration and adaptation to the different use cases. URBANITE makes two clear commitments: generating a local ecosystem involving the different stakeholders, from the sharing of data from the city council and these 3rd parties, its governance to the co-design of urban mobility policies; the second bet, to opt for a freemium solution, in which the technological core of the solution uses, extends and is offered to the open community for its evolution and sustainability. Managing in an iterative way, the definition of the use cases, the evaluation of the feasibility and adequacy of the data sources, the research in the methods and their implementation, from FLOSS solutions sometimes without support, has been the greatest technological challenge of the project, and the reason for a greater effort and

dedication, mainly in the final stages of the project addressing the integration of the components and their customization to specific use cases.

WP2 and WP3 at this stage are aligned with the plan, pending the intake of some unavailable data from the previous period, being in discussions with the providers (e.g. Ring Ring to agree on the best approach to harvest bike data in Amsterdam scenario), They have been resolved in the last year, although some other relevant data has not been finally ingested, since its subsequent exploitation has not been confirmed. The CaPE software tests were carried out, but it has not been finally integrated.

Minor adjustments on the second project report (D1.4) from Fraunhofer: the real effort in WP1 was 0.34PM (changed from 0.35), for WP3 was 7.02 (changed from 7.04) and for WP5, 2.54PM (changed from 2.55).

Next, a table is shown where the accumulated effort spent for the three years compared to the planned effort can be seen.

Table 6. Spent effort vs. Planned effort in M1 – M39

	Spent effort vs. Planned effort in M1 – M39											
	TEC	AD	MESS	ENG	FVH	FgH	JSI	WAAG	AMST	BIL	MLC	Total
WP1 Actual	16,76	3,24	3,75	4,17	1,2	1,09	0,58	2	0,83	0	2,39	36,01
WP1 Planned	23,5	2,66	3,55	4	1	1	1	2	1	0	2	41,71
WP2 Actual	11,66	4,11	5,8	15,99	9,38	0	0	28,5	3,42	1,15	4,11	84,12
WP2 Planned	20	3,03	4,94	16	8	0	0	29,5	3	1	3	88,47
WP3 Actual	25,02	1,85	8,55	10,92	0	34,1	0	0	0	2,07	0,69	83,2
WP3 Planned	34	1,22	7,15	10	0	29	0	0	0	2	1	84,37
WP4 Actual	16,81	1,74	2,46	2,18	0	0	44,67	0	0	0	0	67,86
WP4 Planned	17,42	0,42	1,96	2	0	0	42,37	0	0	0	0	64,17
WP5 Actual	32,48	3,58	2,22	19,26	3,39	7,45	13,41	0	0	1,91	0	83,7
WP5 Planned	28,41	2,76	1,92	18	2	6	10	0	0	2	0	71,09
WP6 Actual	9,17	21,94	11,41	28,19	16,94	0	11,21	20	13,97	9,73	11,57	154,13
WP6 Planned	3	20,41	11,7	26	13	0	8	15	13,5	6	10	126,61
WP7 Actual	8,78	5,85	7,27	16,27	3,56	2,24	6,13	5	0,74	1,58	4,88	62,3
WP7 Planned	8	5,18	7,12	15	4	2	3	5	1	1	4	55,3
WP8 Actual	0	0	0	0	0	0	0	0	0	0	0	0
WP8 Planned	0	0	0	0	0	0	0	0	0	0	0	0
Spent M1-M39	120,68	42,31	41,46	96,98	34,47	44,88	109,72	55,5	18,96	16,44	23,92	571,32
Planned M1-M39	134,33	35,68	38,34	91	28	38	64,37	51,5	18,5	12	20	531,72

Next, the effort spent in this period per partner and the planned effort for this period are compared in the figure below. The particular deviations in this period have been described above.

Figure 6. Comparative of spent and estimated effort per partner (M1-M39)

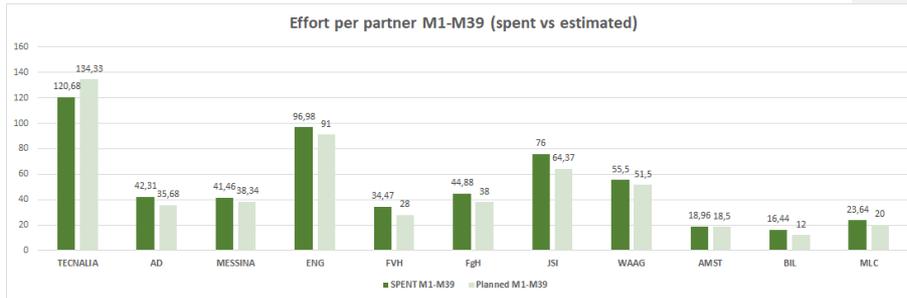
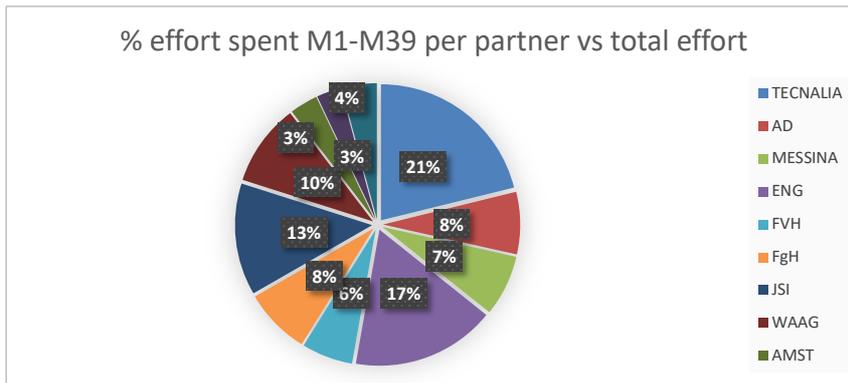


Figure 7. Percent of effort spent per partner (M1-M39)



Cost report

Almost all of the spent costs in this period correspond to personnel costs. This is the cost corresponding to the effort spent in project tasks execution.

Additionally:

JSI’s budget in “other direct costs” was spent in consumables; conference registration fees, and implementing the recommendation engine and decision support system – task T4.2, performed by a member of the department but do not have Slovenian or EU citizenship (Macedonia) under a scholarship exchange schema between Slovenia and Macedonia.

The City of Messina includes in “other direct costs” the purchase of hardware on 23/03/2022 for a total cost of 49980€.

AMS hire Rear Window BV a unique provider of Telraam technology (data provider). Telraam (based in Belgium) is specialised in close-meshed, qualitative and participatory traffic counts in

collaboration with residents and the city of Amsterdam-North for a total of 16.060€ (contract + maintenance). Also subcontracts the preparation of a pair of videos around the AMS use case.

WAAG's budget in "subcontracting" was used to hire an external process coordinator for SoPoLab that was specialised in setting up (data) cooperatives and cooperation plans. This in order to kickstart the bicycle happiness data commons in Amsterdam.

TEC has subcontracted the design of a set of infographics used for the policy brief documentation (1200€), also the registration fees for the BDVA event in Lulea (SE).

The tables below show the costs declared by all partners in this period (M25 to M39) (see Table 7) and so far during the full project project (see Table 8).

Table 7. Costs per partner in all cost categories in the period M25-M39

	URBANITE Budget consumed M25 – M39				
	Personnel	Subcontracting	Other Direct costs	Indirect	Total costs
TECNALIA	249.449,54		27057,67	69.126,81	345.634,02
AD	87.472,95		2358	22.457,74	112.288,69
MESSINA	74.070,00		27900	25.492,50	127.462,50
ENG	118.664,26		4.543,58	30.801,96	154.009,80
FVH	106.887,14		10.548,03	29.358,79	146.793,96
FgH	215.811,99	0,00	3.034,33	54.711,58	273.557,90
JSI	94.833,51	0	12.481,60	26.828,78	134.143,89
WAAG	132.042,00	3.881,00	10.730,00	35.693,00	182.346,00
AMST	104.691,59	0,00	22.919,07	31.902,67	159.513,33
BIL	55.356,00		26.954,50	14.089,05	96.399,55
MLC	55015,22		4396,11	14.852,83	74.264,16
Total					1.806.413,80

Adjustments to the first financial statement:

- FVH. Requested contribution: 804.74€. a) Direct Personal Costs: 643.79€, i) Indirect Costs: 160.95 €
- Fraunhofer. Requested contribution: -25.86 €. a) Direct Personal Costs: -20.69€, i) Indirect Costs: -5.17 €

Table 8. Accumulated costs per partner in all cost categories at M39

	URBANITE Budget consumed M1 – M39				
	Personnel	Subcontracting	Other Direct costs	Indirect	Total costs
TECNALIA	645.782,37	0,00	32.257,12	169.509,88	847.549,37
AD	229.848,40	0,00	2.358,00	58.051,60	290.258,00
MESSINA	186.570,00	0,00	27.900,00	53.617,50	268.087,50
ENG	457.188,70	0,00	4.543,58	115.433,07	577.165,35

FVH	227.284,04	0,00	11.297,05	59.645,27	298.226,36
FgH	351.290,40	0,00	3.034,33	88.576,01	442.900,74
JSI	282.447,67	0,00	36.241,61	79.672,32	398.361,60
WAAG	344.360,00	20.046,00	10.730,00	88.772,50	463.908,50
AMST	183.675,25	0,00	22.919,07	51.648,59	258.242,91
BIL	102.137,00	10.164,00	27.997,10	26.044,95	166.343,05
MLC	109.837,22	0,00	4.867,61	28.676,21	143.381,04
Total	3.120.421,05	30.210,00	184.145,47	819.647,90	4.154.424,42

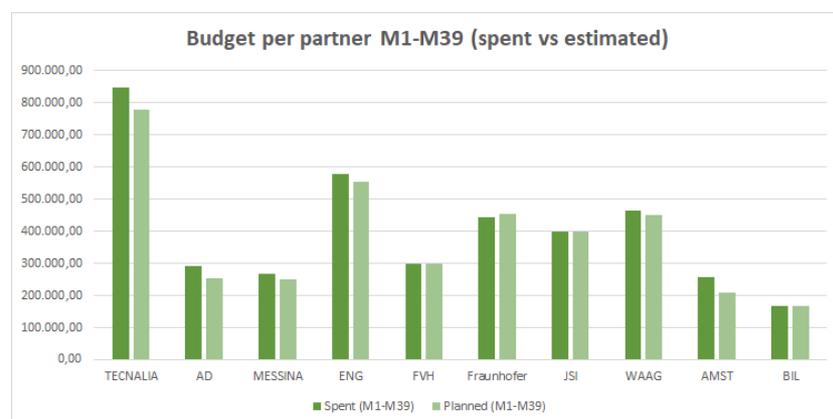
The next capture presents the distributions of the considered natural and actual costs in AD.

Eligible costs:

Cost Category	Unit Cost	Number of Units	Subtotal	Total
a) Direct personnel costs declared as actual costs				111,776.00 €
b) Direct personnel costs declared as unit costs (average costs)				0.00 €
▼ c) Direct personnel costs declared as unit costs				48,352.40 €
c1) SME owner/Natural person costs	35.63 €	1,357.07	48,352.40 €	

Figure 8. Explanation of the costs of the considered natural and actual costs in Alma Digit

Figure 9. Budget per partner M1-M39



The Figure 9 shows the comparison between the budget spent up to now during these two years with the total budget for the whole project (Total EU contribution per partner). These graphics give a rapid overview of the pace at which the budget is consumed according to the timeline of the project.

The figure below shows the percentage of EU contribution spent as of M39.

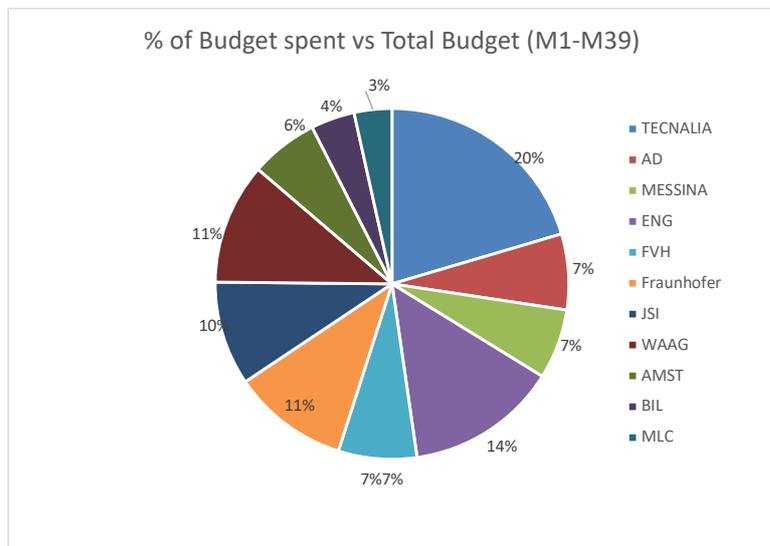


Figure 10. Percentage of EU contribution spent as of M39

5.2.1 Unforeseen subcontracting (if applicable)

WAAG’s budget in “subcontracting” was used to hire an external process coordinator for SoPoLab that was specialised in setting up (data) cooperatives and cooperation plans. This in order to kickstart the bicycle happiness data commons in Amsterdam.

5.2.2 Unforeseen use of in kind contribution from third party against payment or free of charges (if applicable)

Not applicable.

6 Risk Management Plan

In the previous report, the list of managed risks was simplified, eliminating the more generic ones. During this last period, new situations have been identified, some previously included in the complete list of D1.2, and which have had to be addressed. Next, we perform a quantitative analysis taking into consideration the probability and the impact. For URBANITE this is the obtained results for the identified risks during this last period:

Table 9. Prioritization of risks in URBANITE

Probability	High	5 (*)	5 (*)	5 (*),3, 19
	Medium		34, 33,	3
	Low		35,6	8, 4

	Low	Medium	High
	Impact		

Special attention is given to those risks that fall in the red and yellow categories.

(*) this is a special risk since the impact can be variable.

Next, for each of the risks that are still open and that have occurred during this reporting period or where there has been some update, we present a summary table with the mitigation plan and the specific contingency actions that have been carried out when needed. . It also presents the status and final impact on the fulfilment of the milestones and objectives of the project.

Risk ID	3	Type of Risk	Management Operational (WP1)
Risk Description	The coordination of the project fails		
Effect	Bad project progress, poor results and low impact and exploitation	Status (M39)	Not occurred. The project continued its progress and the potential impact due to this risk was mitigated successfully.
Contingency plan	If there is any issue with the project coordinator, the action plan is that the technical leader with the help of WP leaders and of the exploitation manager will take the lead until a new project coordinator can be incorporated		
Contingency actions	The project coordinator (PM) was on medical leave for two periods, according to the action plan the technical leader (TM), also from Tecnalía, took the lead during these periods. As the PM and the TM had worked closely during the project, and with the help of WP leaders and the exploitation manager, the project continued its progress and the impact due to this risk was mitigated successfully.		
Probability	Low	Categorization (Impact level)	High
Risk owners	Principal: Sergio Campos - TECNALIA (PM), Sonia Bilbao – TECNALIA (TM) Contributors: Isabel Matranga - ENG (EM)		

Risk ID	5	Type of Risk	Strategic (WP1)
Risk Description	Project execution risks: a. key milestones delayed b. critical deliverables are delayed		
Effect	Possible delay in work plan. If a critical milestone, potential failure of project.	Status (M39)	Occurred. According to the final schedule of the project, the consortium was able to achieve the expected results at the end of the project in M39.
Contingency plan	This risk is reduced by the expertise of the partners (both technical and management experience) that will allow the identification of planning drifts. Work package roadmaps and the Detailed Activities Plan are key management elements for this risk.		
Contingency actions	The development of the software for performing the simulations took more time than initially planned and some deliverables were released with delays, as the		

	<p>software components are fed from the simulation data. As a result, the delay in D2.5 (3rd SoPoLab) did not have an impact on the project progress, as its content was shared with other WPs in time to be considered in discussions and requirements around use cases and developments, and in any case, discussed in complementary sessions during the 8th and 9th GAs. Additionally, a reschedule and extension of the project (second amendment) were needed, to carry out the validation by the civil servants of all the functionalities of the URBANITE platform.</p> <ul style="list-style-type: none"> • For D4.4 and D4.6 delays, a reschedule and extension of the project (second amendment) were needed, to the validation by the civil servants of all the functionalities of the URBANITE platform. • D2.6 integrates inputs from the user validation sessions. Therefore, in the amendment, it was rescheduled to the end of the project. • D1.6 takes as input the content in D2.6, and presents the results and lessons learned in the project as a series of infographics. • D3.6 delayed its submission to include relevant CaPe (for personal data management) evaluation, but not being finally integrated into the platform had no impact on deployment and evaluation. • The delay in D7.9 was caused by the time required, once the different KPIs of the project and its licensing model, and infrastructure sizing and maintenance costs were completed, for the initial analysis by the companies of the participation model in the URBANITE Alliance and the associated business and sustainability options. 		
Probability	Medium	Categorization (Impact level)	Variable
Risk owners	Principal: Sergio Campos - TECNALIA (PM), Sonia Bilbao (TM) Contributions: All partners		

Risk ID	8	Type of Risk	Exploitation (WP7)
Risk Description	Not reaching a correct audience for project outcome		
Effect	Poor results and low impact in exploitation	Status (M39)	Besides, the feedback in the user validation sessions was positive. In addition, facilitated by the dynamics of local co-creation and participation in related forums, expressions of interest in the project have been received from other municipalities, companies and consultants, from which transfer opportunities have been identified.
Contingency plan	An exploitation strategy will be developed early in the project in order to identify the correct audience and devise strategies to reach them.		
Contingency actions	Continuous monitoring of communication and dissemination plan. Increase activity to share results with target audience. Different mitigation plans have been launched to improve these indicators: Social Network booster and Timeline of Potential Dissemination Channels (described in D7.4 and D7.5) and other good practices indicated by the Communication Staff of Tecnalia and other partners and involving them on the project. Specific dissemination opportunities, with high participation of potential clients, decision-makers and public servants or consultancy firms have been prioritized, for example, those linked to OASC, FiWare or BDVA.		

Probability	Low-Medium	Categorization (Impact level)	High
Risk owners	Principal: Isabel Matranga - ENG (EM) Maj Smerkol - JSI (Dissemination) Sergio Campos – TECNALIA (Communication) Contributors: All partners		

Risk ID	19	Type of Risk	Technical (WP3)
Risk Description	Data sources and data formats are very diverse and difficult to homogenize. Also, sometimes data may be missing or not the right type of data for the intended goals		
Effect	The algorithms will be not effective or will not provide meaningful decisions	Status (M39)	Occurred. The development progressed and was ready for the validations and it was prepared to run (harvesters, algorithms, visualization) incrementally adding datasources when available.
Contingency plan	A harvesting and curation component have been included as part of the data management platform in order to generate the data in a common based format. In some cases, for testing purposes, synthetic data can be generated in order to overcome the non-existence of data.		
Contingency actions	Faced some problems in obtaining some desired data sources such as European Union Statistics on Income and Living Conditions (EU-SILC) microdata. Simulations were fed with alternative data in order to provide results. Alternative datasources also were analysed and harvested exploring alternatives for the calculations and processes. Finally, the acceptance of URBANITE as a research project arrived once the development of data adapters for the WP4 functionalities was frozen. Given the strict requirements of GDPR and considering that the use of such data is not confirmed, its storage was not continued.		
Probability	High	Categorization (Impact level)	High
Risk owners	Principal: Yury Glikman (Fraunhofer) Contributors: Use case leaders, WP4 partners		

Risk ID	34	Type of Risk	Management Operational (WP1)
Risk Description	Delays in work and incorrect estimates fail to meet deadline		
Effect	Possible delay in work plan. If a key technology, possible failure of the project,	Status (M39)	Occurred, but the validation activities with local stakeholders were successfully conducted.

	or less than optimal results.		
Contingency plan	A harvesting and curation component have been included as part of the data management platform in order to generate the data in a common based format. In some cases, for testing purposes, synthetic data can be generated in order to overcome the non-existence of data.		
Contingency actions	The implementation of some key developments has not met the strict timelines of other activities. Some relevant data provided by third parties were not available until the corresponding agreements between the municipality and the supplier were closed. Development and validation activities have been replanned, and an amendment has been submitted. The completion of technical work and its validation have been prioritized over the completion of some deliverables.		
Probability	Medium	Categorization (Impact level)	Medium
Risk owners	Principal: Sergio Campos - TECNALIA (PM), Sonia Bilbao – TECNALIA (TM) Contributors: Isabel Matranga - ENG (EM)		

Risk ID	33	Type of Risk	Management Operational (WP1)
Risk Description	Underestimation of effort needed to complete activities.		
Effect	Possible delay in work plan. If a key technology, possible failure of the project, or less than optimal results.	Status (M39)	Occurred. The joint re-estimation of the activities by the Technical Committee has been proposed, and support from other partners in specific tasks and adjusting the technical scope of the solution achieving all the planned milestones.
Contingency plan	Project Manager, together with the Work Package Leaders, continuously monitors the progress and the resource consumption, and makes reallocation of work between partners and work packages if necessary and possible.		
Contingency action	The planning of some key developments has undervalued (e.g. open source software such as MATSIM or NoiseModelling) the development efforts identified, partly due to technological complexity, but mainly due to the rotation of management profiles with experience in these areas. The joint re-estimation of the activities by the Technical Committee has been proposed, and support from other partners in specific tasks and adjusting the technical scope of the solution.		
Probability	Medium	Categorization (Impact level)	Medium
Risk owners	Principal: Sergio Campos - TECNALIA (PM), Sonia Bilbao – TECNALIA (TM) Contributors: All the partners		

Risk ID	4	Type of Risk	Management Operational (WP1)
Risk Description	Expertise risks a) a key person with a specific expertise leaves the project (even temporarily)		
Effect	Possible delay in work plan	Status (M39)	Occurred, but all the planned milestones.
Contingency plan	Proper documentation through project reporting and deliverables can mitigate this risk, although depending on the profile and the moment in the project, work may need to be rescheduled in order to bring a new person up to speed. Clear communication channels in the project allow partners to inform the coordinator promptly of this risk .		
Contingency action	During the last year of the project, the medical leave of experts of the project in a key technology as the simulations generated delays in the final developments and validation. Although functional documentation existed, the technical details to resume the work by another person or partner were not available, with implementation having been prioritized. Being an open-source SW, which has been extended in the project, external profiles for said works were probed, in corresponding forums, without success. Likewise, other technological solutions were evaluated, but given the project deadlines and the dependence on specific data not available, the readaptation of the developments was not considered viable. As a result, the validation phases of such capabilities were postponed, prioritizing other functionalities in the contrasts.		
Probability	Low	Categorization (Impact level)	High
Risk owners	Principal: Sergio Campos - TECNALIA (PM), Sonia Bilbao – TECNALIA (TM) Contributors: Isabel Matranga - ENG (EM)		

Risk ID	6	Type of Risk	Management Operational (WP1)
Risk Description	Project key technologies, development risks: a) Key technologies or components are not available at the expected time b) development takes longer than expected d) requirements coming from the co-creation sessions cannot be “translated” into technical ones.		
Effect	Possible delay in workplan. If a key technology, possible failure of the project, or less than optimal results.	Status (M39)	Occurred, but all the planned milestones.
Contingency plan	This risk is reduced by tight project reporting at WP level as well as a close follow-up by the Technical Committee and General Assembly in order to react and re-plan as such issues arise. As part of the first deliverable in WP5, a benchmark analysis is planned to be performed in order to understand better the tools and technologies that exist and select the most appropriate one taking into consideration the requirements and needs of URBANITE and the use case providers, as well as the expertise of the technology providers. A clear requirements management process has been defined that encompasses the requirements coming from the technology providers, requirements coming from the use case providers and in a later stage, requirements coming from the		

	co-creation sessions. This will be reported in WP5. However, it should not be forgotten that all RIAs such as URBANITE exist to take technological risks. Where problems arise, they will be identified, and solutions found, or plans altered appropriately.		
Contingency actions	The requirements identified in the use cases regarding mobility simulation are diverse, involving different simulation paradigms, which increases complexity. Besides, when choosing an open-source solution, its adaptation and extension to the use cases have been complex, since there is no support. The development of the interface of these functional components according to the general UI of URBANITE has taken more time than estimated. The teams have been reinforced in these integration tasks, with the support of those in charge of WP5. On the 9 th General Assembly, considering the deep dependence among the work packages (WP2, WP4 and WP6), it was agreed to keep bi-weekly follow-up meetings with additional focus meetings (e.g., recommendation engine, key non-functional requirements, or key results) as needed.		
Probability	Low	Categorization (Impact level)	Medium
Risk owners	Principal: Sergio Campos - TECNALIA (PM), Sonia Bilbao – TECNALIA (TM) Contributors: Maria Jose López - TEC (WP5)		

Risk ID	35	Type of Risk	Management Operational (WP1)
Risk Description	Project key technologies, development risks: a) Technical approach not viable		
Effect	Possible delay in workplan. If a key technology, possible failure of the project, or less than optimal results.	Status (M39)	Occurred, but all the planned milestones.
Contingency plan	This risk is reduced by tight project reporting at WP level as well as a close follow-up by the Technical Committee and General Assembly in order to react and re-plan as such issues arise. As part of the first deliverable in WP5, a benchmark analysis is planned to be performed in order to understand better the tools and technologies that exist and select the most appropriate one taking into consideration the requirements and needs of URBANITE and the use case providers, as well as the expertise of the technology providers. A clear requirements management process has been defined that encompasses the requirements coming from the technology providers, requirements coming from the use case providers and in a later stage, requirements coming from the co-creation sessions. This will be reported in WP5. However, it should not be forgotten that all RIAs such as URBANITE exist to take technological risks. Where problems arise, they will be identified, and solutions found, or plans altered appropriately.		
Contingency actions	Recommendation system for policy design, and the implementation of it started with some delay due to delays on the traffic simulation module, mentioned above. The initial approximation using genetic algorithms approach proved the approach to be too computationally expensive, even after trying several optimization techniques, such as using heuristics to search for feasible solutions and using a surrogate model to assess solution validity instead of a full simulation. In any case,		

	the biggest barrier was the availability of complete simulation data for the adjustment of the learning models. Such experiments for the generation of data required significant time to set up and run due to their complexity, as software adaptations were implemented, it was not possible to achieve a representative volume. Other approaches were explored, such as collaborative recommenders, although they have less cool starting effect, reasonable history is again required to provide useful results. The recommendation engine design was redesigned from the ground up. Based on the decision support system, the solution is explainable (that it is one on the key qualities for the acceptance and actionability of the IA and data analytics techniques), and simple to use.		
Probability	Low	Categorization (Impact level)	Medium
Risk owners	Principal: Sergio Campos - TECNALIA (PM), Sonia Bilbao – TECNALIA (TM) Contributors: Maria Jose López - TEC (WP5)		

References

[1] 2nd Amendment. Description of Actions. URBANITE Consortium, 2023.