E L A B O R A T O R

Deliverable 2.2

Evaluation Plan

*Pending approval from the European Commission

Co-funded by the European Union

Document Control Page

Deliverable number	D2.2
Deliverable title	Evaluation Plan
Deliverable version	1 (for peer review)
Work Package number	2
Work Package Title	Methodology, indicators, and tolls towards co-creating urban mobility interventions
Due date of delivery	M12 – 31.05.2024
Actual date of delivery	30/04/2024
Dissemination level	Internal / European Commission
Type	Framework and plan
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Project name	The European Living Lab On Designing Sustainable Urban Mobility Towards Climate Neutral Cities
Project Acronym	ELABORATOR
Project starting date	01/06/2023
Project duration	42 months
Rights	ELABORATOR consortium

Document History

Version	Date	Beneficiary	Description
0.1	29.04.2024	Felipe Del Busto, CIRCE	Peer Review
0.2	30.05.2024	Felipe Del Busto, CIRCE	Final check-in
0.3	31.05.2024	Jason Sioutis	Submission

Project Executive Summary

ELABORATOR stands for 'The European Living Lab on designing sustainable urban mobility towards climate neutral cities'. The EU-funded project uses a holistic approach for planning, designing, implementing and deploying specific innovations and interventions towards safe, inclusive and sustainable urban mobility. These interventions consist of smart enforcement tools, space redesign and dynamic allocation, shared services, and integration of active and green modes of transportation.

They will be specifically co-designed and co-created with identified "vulnerable to exclusion" user groups, local authorities and relevant stakeholders. The interventions will be demonstrated in a number of cities across Europe, starting with six Lighthouse cities and six Follower cities with three principal aims:

- To collect, assess and analyse user needs and requirements towards a safe and inclusive mobility and climate neutral cities;
- To collect and share rich information sets made of real data, traces from dedicated toolkits, users' and stakeholders' opinions among the cities, so as to increase the take up of the innovations via a twinning approach;
- To generate detailed guidelines, policies, future roadmap and built capacity for service providers, planning authorities and urban designers for the optimum integration of such inclusive and safe mobility interventions into Sustainable Urban Mobility Plans (SUMPs).

ELABORATOR Lighthouse cities

- Milan (Italy)
- Copenhagen (Denmark)
- Helsinki (Finland)
- Issy-les-Moulineaux (France)
- Zaragoza (Spain)
- Trikala (Greece)

ELABORATOR Follower cities

- Lund (Sweden)
- Liberec (Czech Republic)
- Velenje (Slovenia)
- Split (Croatia)
- Krusevac (Serbia)
- Ioannina (Greece)

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Project Partners

Organisation	Country	Abbreviation
INSTITUTE OF COMMUNICATION AND COMPUTER SYSTEMS	EL	**ICCS**
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MUNICIPALITY OF IOANNINA	EL	**IOANN**
PLATOMO GMBH	DE	**PLAT**

Contents

Deliverable executive summary

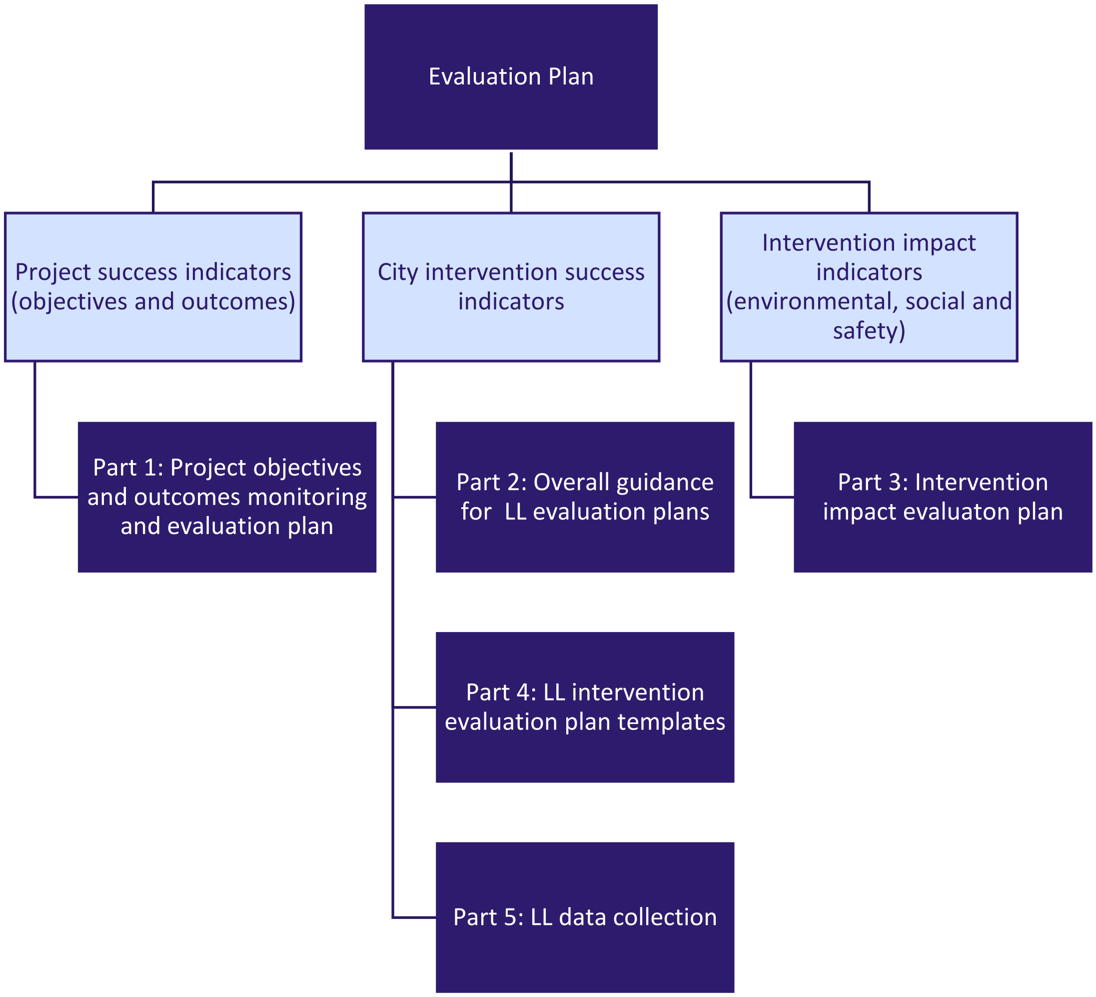
This deliverable, the ELABORATOR Evaluation Plan, forms the basis of a comprehensive impact evaluation framework, one of the project's Key Exploitable Results (KER 6) in WP2. The impact evaluation framework uses qualitative and quantitative analysis to measure environmental, social and safety impacts of solutions and interventions in each Living Labs (LLs). Their effects will be evaluated and assessed in terms of their environmental, safety (physical and psychological) and social impacts, in terms of reducing Green House Gases (GHG) emissions, increase in inclusivity and road safety (WP7). The plan also outlines the range of cutting-edge evaluation methods which will be used including safety assessment models, safety perception tools, user surveys and interviews, workshops and focus groups.

Structure of the deliverable

The Evaluation Plan sets out, in detail, how each of the project’s key performance indicators and impacts will be monitored and measured through reporting and data collection. It will also support LL in the development of their individual evaluation plans.

To do this, this Evaluation Plan provides:

- A clear indication of project-wide requirements to achieve the project’s overall objectives,
- Options for cities to choose the suitable approach for monitoring and measuring them, and
- Advice and step-by-step guidance to ensure cities have the support they need to create an evaluation plan for their interventions and in future projects.
- ELABORATOR Evaluation Plan outline



Part 1: This chapter provides the framework and context on how evaluation will provide value towards ELABORATOR's goals and expectations. It includes the references to the outcomes and impact states in the Declaration of Performance (DOP)

Part 2: This chapter explains the background about evaluation, the phases and what will be expected of cities. It explains how to develop the evaluation goal and how to set up the evaluation in the locations.

Part 3: This part focuses on the indicators with which the impact will be measured. It lists all the indicators available for the project, including indicators stated in the DOP, Sustainable Urban Mobility Indicators (SUMIs) and additional relevant indicators. It furthermore explains which will need to be measured mandatorily and which ones are free to choose based on the intervention.

Part 4: This chapter describes available data collection methodologies. First, it explains the different approach that can be used to measure data. After that there is a description for each methodology for both subjective and objective data.

PART 5: The final part of the framework delves into the safety, accessibility and environmental rating system. It explains what data needs to be collected when and how. Based on the data provided, the results will provide a rating across the 3 areas of safety, accessibility and environment.

ANNEX I: This is a detailed description for each individual indicator. In Part 2 there is an overview with brief descriptions, and there is more information around each indicator and how to measure it in the context of ELABORATOR.

ANNEX II: This part describes counting traffic in more detail. Since this will be a method that many cities are likely to use, there is more support provided on how to set it up and analyze the results.

ANNEX III: Measuring traffic speed is further explained in this annex.

ANNEX IV: Data for Environmental Impact

Links with other work packages/deliverables

D2.1 - Inclusion Plan: This delivery of T2.1 provides further guidance and specifics on evaluation areas linked to inclusion and accessibility. At the related KPIs, it will be referred to the inclusion plan for user group definitions and involvement.

D2.3 - Participatory Playbook: For further information, guidance, and detail for participatory tools. As part of the evaluation, these tools can be used by cities to collect qualitative data.

PART 1 – Setting frame and overall ELAB expectations

The measure of success for the ELABORATOR project are the stated project objectives (1.1) and outcomes (1.2). This Evaluation Plan sets up the processes by which these objectives and outcomes will be measured and monitored, and by whom.

It is important that the LLs are aware of the project objectives and outcomes to ensure good coordination between the interventions being planned and implemented, and the stated goals of the overall project.

For this reason, the objectives (including the verification means) and outcomes (including the outcome indicators) are listed below.

1.1. Project objectives

The objectives of the ELABORATOR project are listed below. Each objective has several '*verification means*' which will be monitored within the relevant WP.

Objective 1: Identify real mobility needs and public space re-design needs, taking into account actual and perceived safety and security of identified vulnerable to exclusion groups.

Objective 1 verification means

Volume and variety of information collected via 12 focus groups (one per city establishment), 6 co-creation workshops, interviews with 5 different vulnerable to exclusion groups and at least 200 participants to the surveyed per LL.
Documentation and publication of the inclusion plan (D2.1).
Baseline analysis of interventions created for each city and accepted (over 75%) by the relevant local stakeholders (WP3).
At least 10 Observer cities participating in workshops, meetings, webinars etc., with an intent to enhance their SUMPs according to the project outcomes, lessons learnt and recommendations.
300 ELABORATOR website visits or social impressions per month.

Objective 2: Improve methods for the collection of data on differences between patterns, behaviors and habits in relation to the mobility of various categories of Vulnerable Road Users (VRUs), towards discovery, replication and quick uptake of urban development innovations.

Objective 2 verification means

Wide variety of urban mobility interventions assessed in the benchmarking based on well-defined mobility indicators including social equity, safety, sustainability and inclusion verified by different types of stakeholders.
Volume and variety of information collected, stored and analyzed at the shared data platform via the real demonstrations at all cities and via 12 focus groups, 6 co-creation workshops, 200 participants in

surveys/interviews with VRUs per LL and at least 100 users of the gamification toolkit within the 3 co-creation workshops at 3 LLs.
Deployment of the diagnostic mobility lab kit and the mobility citizen science kits in at least 3 LLs.
Creation of a knowledge product relating to data collection methods for VRUs.
Data visualisation tool and knowledge hub elements accessed and used from all the participant cities, at least 5 different stakeholder target groups and at least 10 times from externals (cities outside the consortium) after their publication.

Objective 3: Boost the levels of active mobility, particularly walking and cycling, through a range of innovative interventions in urban and peri-urban living labs.

Objective 3 verification means

At least 14 unsafe locations, 10 urban LLs and 4 peri-urban LLs (2 cities combine both urban and peri-urban locations).
12 LL/cities with interventions aimed in use of zero-emission modes as means of transportation, at least 2 LLs interventions using micro mobility apps, 5 LLs directly addressing safety risk by expected increase in cycling and e-scooters, 7 LL addressing rebalance of public space to achieve desired modal split.
Implementation and deployment of the discovered interventions (WP3) according to the project time plan (WP5, WP6).
Number and diversity of users that use and validate the citizen-oriented interventions (WP5, WP6) with at least 75% acceptance of the solutions.

Objective 4: Support local authorities in accelerating mobility changes and address changing travel needs, patterns and behaviors.

Objective 4 verification means

At least 5 innovative interventions twinning between the Lighthouses Cities and the Follower Cities.
At least 10 Observer cities providing their interest in Knowledge exchange for interventions’ future deployment. Already, LoI have been acquired by Athens (GR), Jundiai (BR), Kosice (SK), Larissa (GR), Linköping (SE), Presov (SK) and Tokyo (JP).
Creation of the shared data platform including quantitative and qualitative data collected from the 12 LLs’ interventions deployment in all cities from different stakeholders’ disciplines and diverse user groups respectively.
Usage of the Data Visualisation tool from all LLs decision makers and at least from 10 Observer cities.
Report on mechanisms to operationalize multi-stakeholder governance in LLs (D3.7) and exploitation report (D8.8).
Report on the long-term benefits of the interventions for inclusivity, safety and sustainability (D7.1).

Objective 5: Evaluate the local solutions implemented, including qualitative and quantitative analysis of the LL intervention results, as well as establishing mechanisms for common lesson learning.

Objective 5 verification means

Range and number of professional disciplines (e.g., transport operators, policy makers, city officials, urban planners and regulators) represented in each of the LL stakeholder groups involved in the co-evaluation process (WP3, WP7).
Creation of knowledge product relating to common lessons learned (D6.2 and D6.5).
At least 3 quantitative and qualitative evaluation methods for environmental, social and safety evaluation used (D7.1).

Objective 6: Provide clear guidance on how to systematically incorporate the VRUs dimension into infrastructure planning to cities and Member States and Associated Countries.

Objective 6 verification means

At least 5/year published scientific and technical papers based on project results and learnings (WP8).
At least 13 events to share results and learnings (WP8), one per city and a Final project event.
Creation of Exploitation report (D8.8).
Creation of EU policies and regulations recommendations (D8.9).

1.2. Project outcomes

The outcomes of the ELAB project are listed below. Each outcome has several indicators which will be monitored within the relevant WP.

The outcomes have been organized into five dimensions, which are color-coded for reference. Some apply to all Living Labs, while some will only apply to some.

Dimension 1: Mobility Planning
Dimension 2: Connected and smart mobility
Dimension 3: Safety
Dimension 4: Environment
Dimension 5: Social

Outcome 1: Contribute to the objectives of the Climate Neutral and Smart Cities Mission by accelerating the transition towards climate neutrality in cities through the promotion of zero-emission, shared, active and human-centred mobility.

Outcome 1 indicators

In all LLs: Minimum of a 5% increase in use of zero-emission modes as means of transportation (e.g., biking, walking, etc.)	

In all LLs: Minimum of a 10% reduction of the use of private cars	
In all LLs: Minimum of a 10% estimated reduction of emissions	
Number of new zero emission shared mobility services (2)	
Number of project external cooperation with relevant platforms established (5)	
MoU with CIVITAS initiative (1)	
Number of Climate City Contracts supported (10)	

Outcome 2: Increase the extent and speed of the take-up and upscaling of innovative, best practice and replicable safe, affordable and sustainable urban mobility solutions in the 12 LL and established common lesson drawing and learning at European level, in order to contribute to the priority of the Zero Pollution Action Plan's objectives, the Sustainable and Smart Mobility Strategy and the EU road safety policy framework 2021-2030 for a 50% reduction target for deaths and also for serious injuries by 2030.

Outcome 2 indicators

Number of participant cities to expand interventions beyond the LLs (minimum 6)	
Number of new cities to adopt toolkits for active participation, data platform and visualization tool (minimum 10)	
Number of Observer and new cities to replicate interventions (minimum 3)	
Number of LLs addressing Zero Pollution Targets (minimum 3)	
Number of SUMIs addressed in LL interventions (out of a total of 17)	

Outcome 3: Solutions for at least ten unsafe areas/LL in urban/peri-urban areas using innovative planning, design and implementation approaches including but not limited to co-creation and/or citizen engagement, modelling and AI, digital and smart enforcement tools, dynamic space reallocation, with a view to reducing road safety risks, reducing exposure to air and noise pollution and the perceived feeling of unsafety for pedestrians and cyclists.

Outcome 3 indicators

Showcase for 6 months solutions for at least 14 unsafe locations (10 in urban setting and 4 in peri-urban settings) that score above 75% in user acceptance with special focus on safety perception of VRUs	
12 participant cities and at least 5 Observer or new cities will deploy the technological toolkits for active citizens participation, data platform and visualization tool	
Scaling up and assessment of the showcased solutions for the 12 LLs will result in increased estimation 10% as regards reduction in exposure to air and noise pollution	

Outcome 4: Re-assessed road and public space quality responding to needs of diverse groups (examples include but are not limited to: women, children, people with disabilities and older people), that include improving data collection for foot, bike and e-scooter traffic as well as the mechanisms for reporting pedestrian, cyclists and e-scooter injuries and deaths.

Outcome 4 indicators

At least 4 LLs that addressing re-assessment of roads and public space quality scored over 75% in acceptance responding to needs of diverse groups	
Inclusion plan (D2.1) adopted by all 12 LLs and by at least 10 Observer cities	
Conduction of at least 12 citizen and stakeholder focus groups on the LLs consulted through active citizens participation from diverse user groups	

Active citizens participation toolkits deployed in at least 3 LLs used by min 100 citizens per LL	
Engagement apps used in at least 6 LLs	
Micro-mobility shared services and apps deployed, showcased and tested in the relevant LLs together with relevant infrastructural changes score above 75% in user acceptance as regards safety, usability, efficiency, flexibility, accuracy, etc,. from diverse groups.	

Outcome 5: Proactively addressed potential risk raised by expected increases in cycling and e-scooters.

Outcome 5 indicators

Number of LLs directly addressing safety risk by expected increase in cycling and e-scooters (5)	
Number of LLs to decrease expected safety risk (12)	
At least 5 observer cities are willing to deploy the project's cutting-edge safety evaluation and prediction tools.	

Outcome 6: Rebalanced attribution of public space to different modes of transport so that it better reflects the actual or desired local modal split as well as support reaching Vision Zero and zero-emission objectives, thus increasing road safety and quality of life in cities.

Outcome 6 indicators

Number of LLs addressing rebalance of public space to achieve desired modal split (min. 7)	
Minimum of 5% increase of modal shift toward desired active mode of transport in LL areas	
Number of LLs increase estimated number of quality-adjusted life years due to uptake of active modes and changes in air quality resulting from intervention (12)	
Number of LLs to increase % of travel to 3-star or better for pedestrians and cyclists/micro-mobility users (12)	

Outcome 7: Public space redesigned considering the circular economy principles, adaptation to climate change (in particular heatwaves), cross-sectoral synergies and not come at the cost of removing or deterioration of parks, trees or green recreational areas.

Outcome 7 indicators

Number of LL supporting circular economy principles and cross sectoral synergies (2)	
Number of LL addressing adaptation to climate change (4)	
Number of LL improving streetscape to mitigate the effects of extreme heat (6)	

1.3. Sustainable Urban Mobility Indicators (SUMIs)

The Sustainable Urban Mobility Indicators (SUMI) are benchmarking tools to improve the ability of cities to measure the impact of their new mobility policies and practices.

The 19 SUMIs are referenced throughout the document and are linked to the same dimensions as the outcomes above.

The project team is aware the SUMIs are currently under review. However, without the confirmed new set of SUMIs, the evaluation framework is using the current ones.

Indicator 1: Affordability of public transport for the poorest group	
Indicator 2: Accessibility of public transport for mobility-impaired groups	

Indicator 3: Air pollutant emissions	
Indicator 4: Noise hindrance	
Indicator 5: Road deaths	
Indicator 6: Access to mobility services	
Indicator 7: Greenhouse gas emissions	
Indicator 8: Congestion and delays	
Indicator 9: Energy efficiency	
Indicator 10: Opportunity for Active Mobility	
Indicator 11: Multimodal integration	
Indicator 12: Satisfaction with public transport	
Indicator 13: Traffic safety active modes	
Indicator 14: Quality of public spaces	
Indicator 15: Urban functional diversity	
Indicator 16: Commuting travel time	
Indicator 17: Mobility space usage	
Indicator 18: Security	
Indicator 19: Modal split	

PART 2 – Living Lab intervention evaluation plans

The aim of the Living Lab (LL) intervention evaluation plans is to establish a clear process for measuring and monitoring the success of the LL intervention(s). Each LL's evaluation plan will set out the goals of the evaluation. This will include:

- What the intervention should achieve based on the co-creation process
- How the intervention is implemented (according to plan)
- How the intervention contributed to the overall project objectives and outcomes, and
- How the short, medium and long-term impacts of the intervention will be measured.

2.1 Indicators vs. proxy measures

To evaluate whether an intervention has been successful, indicators need to be defined. With the indicators and related measures one can verify if the intervention has achieved its goals.

Indicators are the clues that show how well something is meeting its goals. What results can you measure and how will you be able to see if the impact has been or will be achieved?

Proxy measures are an indirect measuring indicator. It is a stand-in or substitute for something that's hard to measure directly or something that happens so rarely, that it is nearly impossible to see any changes during the project duration (e.g. using conflicts to indicate safety – instead of traffic fatalities). This helps to give us an idea or estimate about our aimed outcomes

2.2 Clarify evaluation goals

2.2.1 Describing your intervention(s)

Each LL evaluation plan needs to describe the interventions that need to be evaluated. The intervention description(s) will be organized in several subcategories, to ensure consistency across all the LLs.

- **Overall intervention description:** Explain the intervention briefly and the main ideas behind the intervention(s) and its design, and the key challenges or opportunities the intervention is designed to address.

- **Intervention aspects**
  Describe the individual parts of this intervention. For example, if your intervention is to increase accessibility for pedestrian areas, one part would be to enlarge the pathways, another one to add low curbs. It is fine to bundle elements into categories to avoid duplication. For our example that would be "low curbs" instead of mentioning every single location like "low curbs at traffic lights", "low curbs pedestrian crossing 1" and "low curbs at pedestrian crossing 2"

- **Who are the main users?**
  Provide a list of your user groups and what you think their main outcomes will be. It is important to also consider sub-groups based on age, ability and other factors. For example, how are young people or people with sight-impairment likely to be affected by the intervention(s). When looking at accessibility, it

is better to individually describe each of the vulnerable user groups, instead of just summarizing everything into "pedestrians".

- **Boundaries of the intervention**
  The scope and limitations of the intervention(s) should be clearly defined. These could be spatial boundaries (i.e. the streets, intersections or other public spaces where the intervention(s) will be implemented), the modes or services affected, specific road user groups, and/or temporal boundaries (e.g. times or days where parking restrictions come into effect). It is also useful to clearly state anything that is outside of the intervention scope to avoid misunderstandings.

- **Intervention Area and Locations**
  Describe the area (neighborhood or district), and the specific locations where the intervention will be implemented. Include photos and/or maps.

2.2.2 Stating the desired impact

The evaluation plan needs a clear vision of what impacts need to be achieved. This informs how outcomes are defined, and the measures needed to validate them.

There are multiple levels of impact that need to be evaluated. When specific outcomes need to be measured on a project-wide level, it is also called the "top-down" approach.

In ELABORATOR, there are outcomes, including indicators, stated in the proposal and Grant Agreement. Those outcomes must be achieved regardless of intervention. In the case of ELABORATOR, this is formulated in the impact KPIs, of which some are mandatory for every city, others are only relevant depending on the intervention. Please, refer to the table below to see which ones you are required to contribute to.

Furthermore, often used for evaluations is the "bottom-up" approach. The evaluation success indicators and methods will be defined by the intended solution.

In this Evaluation Plan it is suggested to follow a dual approach. Some indicators will be measured to evaluate project outcomes at the end, but cities will still be required to choose the indicators relevant to their intervention to measure the impact.

2.2.3 Define impact

To define impact, it needs to be clear how a solution will tackle a specific challenge by providing impact over time. Those outcomes are defined as short- , medium- and long-term impact. From the description it needs to be clear how the intervention is addressing the problem by achieving those outcomes.

The Theory of Change model is widely used for this evaluation purposes and allows the participants to move things around until everything is connected in a logical and coherent way. The elements of the Theory of Change are:

- **The challenge:** The problem you want to address. Here it is useful to distinguish between what are the root causes and the effects of the problem. This way it is clearer what the intervention will address – the causes or the symptoms of a problem.

- **Solutions: Actions you do as part of this project aimed at addressing the problem.** This will be the intervention, possibly separated into the different elements.

- **Short-, medium-, long-term impact:** Write down what the outcomes will be in each time section. It needs to be clear how some of the short-term outcomes will increase over time. Every long-term impact can be measured by looking at short- or medium-term outcomes, so-called proxy measures.
- **Vision:** This will be your final goal, the mission of the city, a long-term strategic aim that this intervention will contribute to. It will take more than this one intervention to achieve that, but it is useful to know which higher strategic aims this will contribute to.

2.2.4 Prioritize intervention activities

Seeing the solution clearly linked with their proportionate part on the long-term impact makes it a good moment to reconsider the focus and scale of the project. It might be that some ideas are more effectively contributing to the project impact than others.

To prioritize the activities and the elements of the intervention, some key criteria can be discussed as a team or group of stakeholders:

- **Effect on the long-term impact:** Is this idea making a big change in addressing the problem? If the impact is marginal from what can be expected, how could it be increased?
- **Costs:** How much resource in time, budget, space or team will it need to implement this idea? Does the expected impact match with the effort it will take? If there is a disbalance, how could this solution be realized using less resources?

If both the impact and the costs are out of balance, then it might be best to pause or cancel that idea. In this case it might be more sensible to focus on the solutions that are more promising. If there are no sufficient other solutions that were considered already, it is also possible to generate new solutions.

2.3 Choose suitable measures of success for the intervention(s)

To evaluate how well the solutions are suited to achieve the impact you intend, will require measuring data. For this, each outcome needs to have a minimum of one indicator attached. At this point, it is not about methodologies on how to collect the data, but about identifying the unit in which success can be validated. Considering the evaluation framework described in PART 1, there are five dimensions that encompass all indicators expected to achieve in the ELABORATOR:

Dimension 1: Mobility Planning
Dimension 2: Connected and smart mobility
Dimension 3: Safety
Dimension 4: Environment
Dimension 5: Social

Some indicators are project-wide and mandatory. The tables below indicate which outcome indicators are relevant for all cities, and which will just need to be addressed based on the intervention.

This list also provides an additional selection of indicators that can be selected based on the needs of each city. SUMIs are the ones that were already asked for on multiple occasions, so this is the right moment to see if those ones are still the right ones considering your aimed impact. The selection also includes additional indicators, sourced from different places including Civitas. They are provided because they are an excellent addition to the KPIs and SUMIs by offering another way in which to measure impact.

2.3.1 Mobility Planning indicators

Outcome indicators (Grant Agreement)			All LLs
1.1	Expand intervention beyond the LL	This means that the interventions will be successful in a way that they can be scaled to other areas in the city or country.	
1.2	Addressing re-assessment of roads and public space quality scored over 75% in acceptance responding to needs of diverse groups	Through the intervention, the quality of road and public space has increased by measuring the satisfaction of diverse user groups.	
1.3	Addressing rebalances of public space to achieve desired modal split	How your intervention has led to changes in the public space, that either motivate, enable, support or ensure people use different modes of transport which are aimed for by the city.	
	SUMIs		
1.4	Congestion and delays*	Average of delays on main roads for private and public transport. It can be observed by comparing road traffic and public transport travel time during peak hours compared to off peak travel.	
1.5	Opportunity for active mobility*	Presence or not of infrastructure dedicated to active mobility (walking, cycling)	
1.6	Multimodal integration	Any place where a traveler can switch from one mode of travel to another, with a minimum/reasonable amount of walking or waiting. The more modes available at an interchange, the higher the level of multimodal integration.	
1.7	Quality of public spaces	The perceived satisfaction of public spaces.	
1.8	Urban functional diversity	Functional diversity refers to a mix of spatial functions in an area, creating proximity of mutually interrelated activities.	

*Will be measured for all LLs in the impact evaluation (WP7) based on data collected in the LL assessment sites.

2.3.2 Connected and smart mobility indicators

Outcome indicators (Workplan)			All LLs
2.1	Reduction of private care use*	There needs to be evidence that the intervention in the LL has contributed to reduced car use.	X
2.2	Deployment of Zero Emission and shared mobility services	The number of services implemented through the Elaborator project.	
2.3	75% user acceptance for zero emission services	Micro mobility shared services and apps that were deployed and tested together with infrastructural changes score more than 75% user acceptance.	
2.4	5% increase of desired modal split*	This is aiming for an increase in the use of active mobility modes of transport.	X
	SUMIs		
2.5	Access to mobility services	Share of population with appropriate access to mobility services (public transport: bus, tram, metro, train, etc.).	
2.6	Commuting travel time	Duration of commute to and from work or an educational establishment, using any types of modes.	
2.7	Modal split*	Modal split gives an overall measure of the importance of each mode of transport for passengers and freight in an urban area.	
2.8	Urban functional diversity*	Functional diversity considers the presence or not of spatial functions related to daily activities (hospitals, schools, sports and recreation, residential, parks, shops, etc.) in an urban area.	

*Will be measured for all LLs in the impact evaluation (WP7) based on data collected in the LL assessment sites.

2.3.3 Safety indicators

No	Outcome indicators (Workplan)		All LLs
3.1	Solutions in unsafe locations score above 75% user satisfaction	Over 6 months, solutions must be tested in areas regarded as unsafe. 75% user satisfaction must be measured to	

		contribute to this KPI. There is a special focus on safety perception of VRUs.	
3.2	Addressing safety risk for cycling and e-scooters*	For cities contributing to this KPI, there needs to be a plan in how to mitigate the risk and avoid crashes involving cyclists or users of e-scooters. What is needed is an intention to implement those measures alongside the intervention.	
3.3	Decrease of safety risks*	Cities need to show how their interventions are expected to actively contribute to reducing safety risks.	X
3.4	Deploy cutting-edge safety prediction and evaluation tools	That would be one of the more tech-led evaluation data collection methodologies.	
3.5	Minimum of 3 Star Rating*	This looks at the % in increase of mobility services that are rated with 3 stars or more. This regards all services for pedestrians, shared or micro mobility.	
	SUMIs		
3.6	Road deaths*	Road deaths by all transport accidents in the urban area yearly.	
3.7	Traffic safety active modes*	Fatalities of active modes users in traffic accidents in the city in relation to their exposure to traffic.	
3.8	Accessibility of public transport for mobility impaired groups*	Vulnerability groups include those with visual and audial impairments, with physical restrictions, such as pregnant women, users of wheelchairs and mobility devices, the elderly, parents and caregivers using buggies, and people with temporary injuries.	
	Others		
3.9	Conflicts	Conflicts or "near-accidents" are highly correlated to accidents – and are often used as a proxy indicator of safety in specific locations, such as intersections or crossings.	
3.10	Speed*	Vehicle speeds are correlated to both accident risk and accident severity.	
3.11	Perceived safety	Users (pedestrians, cyclists etc.) perceived safety and hence even willingness to walk or cycle in a certain area is also a good indicator of the VRU safety and is a good reason to study the area further, with e.g. conflict techniques. The perceived safety can be assessed with various survey	

		techniques, such as online surveys, interviews, local focus groups etc.

*Will be measured for all LLs in the impact evaluation (WP7) based on data collected in the LL assessment sites.

2.3.4 Environmental indicators

Outcome indicators (Workbook)			All LLs
4.1	Increase of Zero Emission modes*	The use of transport should increase amongst the modes of transport that reduce the air pollution in the LL. This can be for example cycling, walking, e-scooter, public transport etc.	X
4.2	Reduction of emissions*	Carbon dioxide emission reductions from the use of energy could be achieved by fuel conversion, increased efficiency, reducing energy demand and increased use of non-fossil energy sources. There needs to be an estimated 10% reduction of emission in LLs.	X
4.3	Reduction in exposure to air and noise pollution	The scaling of the solutions is expected to reduce the road user's exposure to air and noise pollution by 10% min.	X
4.4	Climate city contracts supported*	The interventions need to contribute to the cities SUMPs, having a clear impact on the mission.	
4.5	Addressing Zero Emission targets*	This asks for the number of LLs addressing Zero Emission targets. This can also be part of local SUMPs in some cities.	
4.6	4.5 Increase of quality-adjusted life years*	This impact is expected to be generated by an uptake of active transport modes. That shift will increase the air quality and therefore improve the overall health of citizens.	X
4.7	Supporting circular economy principles and cross sectoral synergies	This KPI will look at the number of LLs supporting circular economy principles with the implementation of their intervention.	
4.8	Adapting to climate change*	This requires a number of interventions that help cities to adapt to climate change.	

4.9	Mitigate extreme heat*	Elements of the intervention should contribute to mitigating extreme heat conditions in your city.	
	SUMIs		
4.10	Air pollutant emissions	Pollutants emitted by public and private transport activities contribute to ambient air pollution and put significant pressures on the environment and human health. The indicator measures the relative change in the emissions of multiple pollutants (CO, NOx, NMVOC, SOx, NH3, CH4, N2O, PM10, PM2.5) in transport activities.	
4.11	Energy efficiency	The efficient use of energy contributes to less energy consumption and the reduction of greenhouse gases released to nature, thus improving environmental sustainability.	
4.12	Noise hindrance	Hindrance of population by noise generated through city transport.	
4.13	Greenhouse gas emissions (GHG)	GHG emissions by all urban passenger and freight transport modes.	
	Others		
4.14	Air surface temperature regulation	Surface air temperature is the temperature of the air measured at a height of around two meters above the surface.	
4.15	Water management regulation	The amount of water estimated to be re-addressed in a more sustainable cycle by the intervention.	
4.16	Biodiversity	Biodiversity improvement index" quantifies the positive changes in species richness and ecosystem diversity resulting from urban planning initiatives or nature-based solutions.	

*Will be measured for all LLs in the impact evaluation (WP7) based on data collected in the LL assessment sites.

2.3.5 Social indicators

Outcome indicators (Workplan)			**All LLs**
5.1	Toolkits adopted and deployed	The adoption and deployment of the technological toolkits is key to achieving this goal, since they serve as instruments	X

		for active participation, data platform, and visualization tools.	
5.2	Focus group consultation	Number of citizen and stakeholder focus groups consulted through active citizens participation from diverse user groups.	X
5.3	Use of engagement apps	This indicator evaluates if and how the apps are being used in the project.	
SUMIs			
5.4	Satisfaction with public transport	The perceived satisfaction of using public transport.	
5.5	Affordability of public transport for the poorest group	Proportion of the income of the poorest households spent on urban public transport for basic activities	
5.6	Security	The perceived risk of crime and passenger security in urban transport.	
Others			
5.7	Awareness level	Awareness level refers to the degree to which individuals or groups are aware of an intervention based on provided information.	
5.8	Intervention acceptance level	Acceptance of the intervention will mean the willingness of citizens to use the new products, services or spaces.	
5.9	Citizen satisfaction with transport services and operations	The overall quality of transport services encompasses a variety of aspects. Travelers usually share a holistic concept of quality, which this indicator seeks to measure.	
5.10	Perception of level of physical ability	Perception of service accessibility is the user's perception of the service's physical accessibility.	
5.11	Perception of level of social accessibility	Perception of service accessibility is defined as the user's perception of the broader social accessibility of the service.	
5.12	Quality of cooperation structures with stakeholders	Level of quality of cooperation structures between all public and private stakeholders to develop and implement sustainable mobility solutions.	
5.13	Citizen satisfaction with the mobility and public space infrastructure	User/provider/stakeholder average reported satisfaction with the overall quality of the mobility and public space infrastructure.	

The description for each indicator is to be found in the Annex I.

2.4 Selecting the data collection methodology/ies

Evaluation methodologies are essential tools used to assess effectiveness, efficiency, relevance, benefits, and impacts of realized projects, policies, or interventions. An appropriate methodology selection could highly influence outputs leading from measurements, evaluation, and impact assessment. Therefore, the methodologies should reflect co-design of interventions in wider perspective.

The evaluation methodology provides a structured framework with techniques on measuring, collecting, analyzing, and interpreting data to provide sufficient and informed decisions with improved outcomes.

There is a wide range of evaluation methodologies, and its selection depends on various factors, including nature of the intervention, available resources, involved stakeholders, evaluation purposes, and other preferences. However, some common approaches are based on:

- Quantitative evaluation
- Qualitative evaluation
- Mixed methods of qualitative and quantitative approaches

These approaches provide different perspectives on how to evaluate the subject of study depending on allocated resources. While the quantitate approach mainly aims to have a wide range of perspectives that affect the evaluation, the qualitative approach focuses primarily on selecting appropriate parameters to ensure valid evaluation e.g. based on knowledge of local conditions which are neglected in the quantitative approach. Therefore, some methodologies rely on mixed methods of qualitative and quantitative approaches so that both views are included in the evaluation criteria.

It also depends on the stage of the project (or intervention) to which the evaluation should be applied. Therefore, the methodologies could differ for evaluating the process, evaluating the outcomes or measuring impacts.

For the purpose of the ELABORATOR project and city intervention impact evaluation, the methodologies are split into the group of subjective methodologies and the second group of objective methodologies.

2.4.1 Subjective data collection methodologies, their requirements, strengths and weaknesses

Subjective evaluation is based on individual and subjective experience, perception or judgment with the knowledge of assessed issue. For example, this could include a group of residents that are directly affected by the implemented city intervention.

The main goal is to provide qualitative in-depth observation with addressed relations rather than objective measurement or quantified evaluation on numerical data. Therefore, this approach is based on methods such as surveys, interviews, and data about individual experiences to include complex perspectives with understanding of context.

The subjective evaluation methodology is a valuable approach considering complex points of view, deep insight based on previous experience, contextual understanding, active participation, and contribution by individuals. The advantage is also flexibility of the approach to appropriately selecting the approach to data acquisition e.g. based on interviews, protocols, etc. Therefore, it can be adapted and addressed specifically to the evaluated issue.

The subjective approach provides valuable insights into the experience-based evaluation, though there are still several limitations and weaknesses to be considered. The subjective approach relies on individuals' perception, interpretation, and judgement. Therefore, the outputs, assumptions and evaluation perspectives could be influenced e.g. by survey design, leading of interview, data collection approach, its analysis and interpretation.

Furthermore, for any methodologies involving citizens, there are other deliverables of ELABORATOR which must be referred to. Duplication and eventual inaccuracies are aimed to be avoided by having clear responsibilities for every deliverable.

D2.2 Evaluation Plan	Describing the approach on how to evaluate the project and the intervention. Defining the indicators and suggesting useful methodologies.
D2.1 Inclusion Plan	For any definitions of user groups, guidance on how to ensure a representative user spectrum, how to increase diversity and equity when implementing the interventions. There are also definitions and descriptions of specific indicators regarding user groups involvement.
D2.3 Participatory tool playbook	For all the participatory tools for citizen engagement. In the evaluation plan, this will be important when choosing the right data collection methods. There are very few subjective methodologies described here. For a more exhaustive list of subjective tools, there is a reference in each relevant indicator (Annex 1)
D2.4 Active Citizen Toolkit	This will consist of tools developed for cities to collect data. They are not included in the Evaluation Plan but are referenced in the relevant indicators. The tools can be regarded as part of the methodology's groups of “5 Road data from device”, “recording device in the vehicle”, “10 Counting sensors and traffic/speed management”, “12 Road data from controlled intersection & related services”, “13 CO_2 sensors, air quality sensors”

The findings from subjective evaluation are limited from a statistical point of view. Generally, they are not measurable, and it is difficult to replicate all the circumstances of investigation within the evaluation and assessment.

The following table contains examples of criteria to be considered within the subjective approach.

Examples of criteria for subjective methodologies

Dimension	Example of subjective methodology criteria
Mobility Planning	Workshops
Connected and smart mobility	Interviews
Safety	Civic meetings
Environment	Participatory methods (D2.3)
Social	Survey on transport accessibility

This section contains general descriptions and objectives of the available evaluation methodologies, or approach that enables data acquisition. Furthermore, the data collection guidelines are described with the defined source where the approach was applied.

The following tables generally describe several methods that differ based on the level of difficulty; therefore, the guidelines are defined in terms of the following technological requirements:

Civic meetings	
Description	Civic meetings are used to present and discuss important projects and plans to citizens. The presentation is usually made by the organizations or people responsible for the project - the designer, the relevant official, the city department, etc. The aim of the method is to present an important project or plan and discuss its main aspects or collect comments on the form of its implementation. An important part of the public hearing is usually a visual presentation, enriched with digital maps, simulations/renders, drawings or mock-ups. Good facilitation is crucial; facilitators should be skilled in encouraging constructive dialogue so that all voices are heard, and the discussion is respectful. After the discussion, it is important to summarize, define next steps and keep participants informed. Ensure all materials are accessible, considering different demographic groups and specific needs.
Data collection guidelines	Key aspects of large projects Aspects of public space Satisfaction with parking, cycling infrastructure

Interviews	
Description	An interview is one of the key methods of obtaining information (data collection). It represents formal face-to-face communication with potential stakeholders. It is not only a one-sided acquisition of data from the interviewees, but a joint creation of meaningful statements. The interview uses the technique of asking questions. They can be open or closed. Open questions are primarily used to obtain qualitative data. In general, interviews are more appropriate for qualitative data collection, therefore less suitable for mass data collection. They allow in-depth understanding of the interviewee's perspective, emotions and motivation which are not captured by quantitative methods. Interviews can be done online or in-person. Basic interview types according to the degree of structuring: 1) Structured interview • Questions are known in advance and binding, • Disadvantages: the person who asks the questions has minimal freedom when conducting the interview - they can, for example, only clarify a concept to the interviewee, or clarify the answer to the question, there is no opportunity to ask questions, • Advantages: the precise structure allows us to obtain data from a large number of people and then to compare the results.

	2) Unstructured interview • The questions (their content, wording, sequence, etc.) are not precisely formulated, the interviewee is encouraged to tell, the interviewer asks questions (however, they still follow the goal of the investigation), • Advantages: enables more detailed and deeper knowledge, acts more naturally on the interviewee, • Disadvantages: unsuitable for mass data collection, difficult to summarize and evaluate data and higher requirements on interviewer. 3) Semi-structured interview • Some parts can be completely structured and others unstructured, • Advantages: it uses the advantages of both previous types of interviews, it is possible to ask any supplementary questions (e.g. If the interviewee does not understand or misunderstands one of the questions), • Disadvantages: places greater demand on the interviewer and their preparation. Further can be distinguished between the interview according to the type of contact (personal interview - face-to-face or with the support of technical means - e.g. telephone interview) and according to the number of people with whom the interview is carried out (individual or group). A group interview can be run by reading out the questions from the self-guided form and the interviewees record their answers on their form. PAPI (Paper and Pencil Interviewing), CAPI (Computer Assisted Personal Interviewing), CATI (Computer Assisted Telephone Interviewing) CAWI (Computer Assisted Web Interviewing).

Data collection guidelines	The best practice should include interview recording, transcribing and analysis. For recording, written consent is necessary. Transcription can be done automatically using digital tools (for example, MS Office), but make sure to anonymize it. Interview analysis can also be a demanding task, identifying patterns within the data. ** Satisfaction with: • parking (in general, at the place of residence, at the place of work), • conditions for bicycles, with the condition of the bicycle infrastructure, • conditions for walking on foot, with the condition of the pedestrian infrastructure. • Evaluation of the functioning of public mass transport: • the frequency and extent of public transport in use, • motivations/barriers to use, • satisfaction with individual dimensions (frequency of connections, availability of stops, feeling safety, price, availability of connections, travel time, comfort, etc.). Car parking and bicycle storage options: • parking a car at the place of residence (options: on private land, reserved parking, public space), • parking a car at work, • bicycle storage at work / at school (options: on the street, safe storage). Willingness to change the mode of transport: • frequency of use of individual transport modes, • the degree of willingness to change the used modes in favor of individual sustainable modes (public transport, bicycle, walking), • barriers in the transition to sustainable transport modes.

Workshop

Description	Workshops can be used to apply a collaborative approach to evaluation methods and data collection. The workshops make it possible to involve each particular stakeholder from a wide range of potential participants. Therefore, it is possible to provide highly expert points of view from different perspectives, e.g. architecture, transport, urbanism, economy, society, etc. However, it is also possible to appropriately combine experts and people with experience of living in the place of intervention, thus ensuring knowledge of specific inputs and enriching the discussion. Workshops are an efficient way to share knowledge, engage stakeholders, brainstorm, build consensus, build capacity, build expertise, etc. Appropriate design of the participatory platform will ensure high quality outputs that could include data, know-how, experience and knowledge transfer. One specific example of this collaborative approach is the use of *Mapathons*. *Mapathons* are events where volunteers collaboratively create and improve maps, often using OpenStreetMap data. These events can bring together a diverse group of participants, including local residents, experts, and enthusiasts, to contribute valuable geographic information. This collective effort enhances the quality and detail of the maps, which can be particularly useful for urban planning and decision support systems. Ensure that skilled facilitators are involved to lead a constructive, positive and respectful dialogue and to facilitate the brainstorming and idea generation process.
Data collection guidelines	• Workshop objectives and stated goals, • Expert knowledge • In situ experience • Historical and forecast data • Audience questions

Survey	
Description	Surveys are a widely used data collection method, allowing researchers to collect large amounts of data from pre-defined groups of people. They are best used for quantitative data but can also gather qualitative insights. A survey collects data that can be statistically analyzed to generalize findings across a population. This requires careful questionnaire design, appropriate sampling and statistically correct analysis. Studies can be performed online, over the phone, face-to-face or using paper questionnaires. These diverse methods allow data collection from different demographic groups. Challenges include ensuring that samples are large enough to reflect the general population, that questions are worded so that everyone has the same

	understanding, and that surveys that are too long can lead to less accurate responses. ** Traffic research means finding out traffic conditions on roads and/or traffic behavior of persons in the given territory and time interval. Surveys of traffic behavior usually indicate three basic types of research units – households, members of these households (people) and about the journeys these people take on the specified day undertaken. A traffic survey is a summary of activities by means of which information about road transport and the operation of transport facilities or other is discovered. It is to obtain materials for transport planning, design and modernization of transport networks and facilities, as well as for improvement proposals for operating conditions on existing networks or transport facilities from the point of view of safety, fluidity, comfort, economy of transport and their consequences on the environment. The goal or purpose of a traffic survey, therefore, is to obtain qualitative and quantitative data on traffic in the line of expected evaluation goals. One way of conducting a survey is to use questionnaires. Research conducted using questionnaire surveys can measure sociological phenomena and analyze them using mathematical modules and statistical techniques. Questionnaires are sent or verbally communicated to a selected group of people. Thanks to this method, it is possible to collect a large amount of data with less detailed information. This information can be applied to a wider range of people. Since it is not possible to examine the entire population, a so-called representative sample is selected. This is a smaller part of the group to be examined. If the sample is well chosen, the result of the survey can be generalized to the entire population. Representative sample: Choosing the right sample of people is very difficult. The group of people selected must be typical of the entire population. Everyone should be able to get into this representative sample. Therefore, a random sample is also part of a representative sample. The research team selects part of the group at random, e.g. by giving everyone a number and each person with the number 10 is included in the research. Convenient sampling: The sample is selected according to the willingness of the interviewees, i.e. the group of interviewees includes everyone who is willing to participate in the survey. Such a method of sample selection is often used in the research of social groups. Results may not be exact.
Data collection guidelines	Disposition by means of transport: • On ownership of driving licenses, about prepaid fares and public transport discounts. Availability of vehicles (possibility to use the vehicle independently of other household members): • The number of available private vehicles, • The number of available company vehicles,

	• Availability of carsharing, • The number of available commercial vehicles, • The number of available motorcycles and mopeds, • The number of bicycles available, • Number of e-bikes Available car parking / bicycle storage: • At home • At work or school. Modal split Satisfaction with: • Parking (in general, at the place of residence, at the place of work), • Conditions for bicycles, with the condition of the bicycle infrastructure, • Conditions for walking on foot, with the condition of the pedestrian infrastructure. • Evaluation of the functioning of public mass transport: • The frequency and extent of public transport in use, • Motivations/barriers to use, • Satisfaction with individual dimensions (frequency of connections, availability of stops, feeling safety, price, availability of connections, travel time, comfort, etc.). Car parking and bicycle storage options: • Parking a car at the place of residence (options: on private land, reserved parking, public space), • Parking a car at work, • Bicycle storage at work / at school (options: on the street, safe storage). Willingness to change the mode of transport: • Frequency of use of individual transport modes, • The degree of willingness to change the used modes in favor of individual sustainable modes (public transport, bicycle, walking), • Barriers in the transition to sustainable transport modes

Road data from device	
Description	Stationary devices continuously collect traffic data at fixed locations in a network, they can give insight about the traffic at locations over a longer period of time.

	Mobile devices have a wider range and can collect traffic data over a larger geographic region. Mobile networks can serve as ubiquitous sensors for physical mobility. The basic functionality of both active stationary and active mobile devices for traffic data collection is that they should be able to detect vehicles, identify them, and communicate the collected data to the responsible authorities. The number of mobile devices mainly depends on the incentives of drivers to let their vehicles act as probe vehicles. The acquisition of data is highly influenced by the technological components, e.g. a camera-based system provides visual based perception, a telecommunication-based system is affected by user base and standards.
Data collection guidelines	

<table>
<tr><th colspan="2">Simulation Software, digital tool</th></tr>
<tr><td>Description</td><td>Several modeling tools and techniques are available to support the creation and evaluation of scenarios. The purpose of transport models is to express the interrelationship between transport demand and transport supply, and to quantitatively predict and compare things that do not yet exist (ie future scenarios).

For shorter-term and less extensive projects, qualitative estimates of the likely effects of tested measures and solutions for mobility in similar urban conditions can also be used.

Specific simulation and decision-support tools can also be developed internally by the project partners. Additionally, models can be created to evaluate the effects of completed or planned projects, e.g. on accessibility. These models can also be used to develop and utilize specific KPIs to measure for evaluation purposes.

Traffic models are not necessarily the best solution for scenario analysis. Building and using them requires time, resources and data. Under unsuitable conditions, qualitative or simpler quantitative techniques can therefore be recommended, as the creation of a modeling tool could lead to a waste of time and money. However, it should be remembered that more reliable results are given by a well-built model. Basing strategic decisions on simple assessment methodologies to save time and money in the preparation phase can result in much more money being wasted by implementing the wrong strategy – especially if it involves infrastructure measures.

Static models do not consider dynamics over time. Static models calculate traffic volumes (intensities) for a predetermined time interval (e.g. 24 hours or rush hour) while no change is considered in time. The result of the static model is the model traffic intensities on the network in the form pentagrams that do not change over time.

Dynamic models, on the other hand, evolve over time and some of their properties may change over time. They are used for the analysis of phenomena that change in short time intervals. An example can be a traffic model that considers daily traffic variations, thus providing data on traffic loads and transport currents for different times of the day.</td></tr>
<tr><td>Data collection guidelines</td><td>Effective data collection is essential for building accurate and reliable models. Key aspects:
Types of Data Needed: it is important to identify the types of data required for constructing and validating models.
Data Quality: ensure the quality of the data collected by focusing on accuracy, completeness, and timeliness.
Stakeholder Involvement: engage stakeholders in the data collection process to ensure all relevant information is considered. Stakeholders can provide valuable insights and help in gathering comprehensive data.
Standards: follow established standards and protocols in data collection to ensure compatibility and interoperability of data.</td></tr>
</table>

	• Ethics and Privacy: Address ethical and privacy considerations in data collection. High-quality data enhances the accuracy and reliability of the models.

Recording devices in the vehicle	
Description	A recording device means an electronic system, and the physical device or mechanism containing the electronic system, that primarily, or incidental to its primary function, preserves or records, in electronic form, data collected by sensors or provided by other systems within a motor vehicle. "Recording device" includes event data recorders, sensing and diagnostic modules, electronic control modules, automatic crash notification systems (e.g., the eCall system used in vehicles across the EU which automatically makes a 112 emergency call if the system detects that a vehicle is involved in a serious road accident), geographic information systems, and any other device that records and preserves data that can be accessed related to that motor vehicle. A "recording device" does not include onboard diagnostic systems whose exclusive function is to capture fault codes used to diagnose or service the motor vehicle. A “recording device” can be a standard smart phone with a special application which requires geolocation data (i.e., the user should enable the location function) to analyze user’s driving based on exceeding speed limits, sudden braking and accelerations, etc. Certain car insurance companies use such applications to motivate their clients to drive safely by providing them certain bonuses based on their results recorder by the App. Floating car data - data collected from vehicles equipped with relevant vehicle units, which are transmitted to traffic information and control centers to evaluate and determine the basic trends of road traffic development. A widely known floating data system is Google Maps which, based on data sent by users with an enabled geolocation function, collects and shows traffic flow densities.
Data collection guidelines	Road sections with (frequent) traffic accidents Road sections with frequent speeding Road bends with frequent excessive braking Road users' behavior while driving in specific traffic flow densities (e.g., low density, high density, congestion)
Source	PSAP (public-safety answering point) operators’ databases (eCall related data, if available) Car insurance databases (if their clients use “driving” App)

Floating car data	
Description	This data can be obtained from the portal of the State of Transport for selected sections. The goal is also to acquire, process, use and make available data sources, including data from so-called "floating vehicles" (FCD) - i.e. vehicles determining

	their position using Global Navigation Satellite System (GNSS) and sending it to the back office for processing for various reasons. The operators of these services then make it possible to evaluate the mobility data anonymously. The main benefit of FCD data is the comprehensive measurement of traffic flow and the determination of driving times in sections in the monitored area. The disadvantage, on the other hand, is the lack of coverage of all vehicles, i.e. the impossibility of determining the intensity or density of traffic. FCD data represent a complementary source to data from induction detectors, cameras, section measurements, toll system and weighing systems, which, on the other hand, measure traffic intensity, speed and other information in a specific section (profile) of the road. The data is provided in real time and via the open DATEXII interface or in XML format. The data is anonymized and has the same defined structure, and outputs can be obtained every minute in terms of essential traffic engineering data such as traffic intensity, speed, and other parameters.
Data collection guidelines	Opened data inquires
Source	

2.4.2 Objective data collection methodologies, their requirements, strengths and weaknesses

Objective methodologies focus on measurable and quantifiable observatories, where a wide range of perspectives could be applied. They provide standardized metrics and procedures. Therefore, it is simply replicable in a different place or time.

Compared to the subjective approach to evaluation, the objective approach provides quantitative data collection. Therefore, the potential outcomes provide the opportunity for big data application, numerical and statistical analysis, and comparison with other evaluation outcomes because of consistency and standardized utilization. Moreover, the objective approach is more focused on a reliable and valid manner that could be reproduced.

The main advantage of objective methodologies is unification and standardization. Therefore, stated KPIs could be applied to ensure that an assessment is widely applicable. It could also be applied for further interpretation by using specific coefficients that are unified. The objective approach is also applied in legislation, e.g. for property-price maps based on the specific coefficient such as risk of floods, civil facilities, transport accessibility, public transport availability, and many others.

On the other hand, the objective evaluation methodology does not consider contextual understanding. It simplifies complex perspective and reduces it to its quantifiable measures. In case of a measurement error, the outcomes could lead to potential misleading results. The total misleading of potential outcomes could happen because of measurement error. Therefore, the methodology should be carefully designed and validated before its application.

The following table contains examples of criteria to be considered within the objective approach.

Examples of criteria for objective methodologies

Dimension	Example of objective methodology criteria
Mobility Planning	Average travel time to city center
Connected and smart mobility	Walking distance to bus stop
Safety	Number of fatal and serious crashes

Environment	Total area of public and green space
Social	Averaged number of trips per day

i. Objective evaluation methodologies

Similarly to subjective methodologies, based on differences in the difficulty level, the guidelines are defined in terms of the following technological requirements:

- Medium tech
  - Parking counts
  - Traffic counts
- High tech
  - Counting sensors and camera-based traffic management for bikes
  - Public/Private Services database
  - Counting number of rental bikes
  - Road data from a controlled intersection and related devices
  - CO2 sensors, air quality sensors
  - Public transport operational data

Parking counts	
Description	One way to conduct traffic surveys is using automatic detectors built onto the road or attached to it. These are suitable for use for long-term surveys. The disadvantage is the need to purchase and install a technical device. Fully automatic is the method based on sensors in parking spaces, it is assumed equipping parking spaces e.g. with magnetic detectors that detect the presence of a vehicle in the given parking space. One of the possibilities of implementation is counting using camera footage, which has its advantages for use in parking areas with camera surveillance. The camera footage is then processed by an authorized worker who records arriving and departing vehicles. A survey then does not need to be done in real time but can be viewed afterwards with the video recording. For providing secure bike parking in public spaces, bike parking racks with integrated locks or bike parking lockers are examples of advanced solutions. Locks and lockers are usually combined with IoT technology (Internet of Things) enabling checking lock/locker status (free, occupied) in real-time and collecting usage data useful for further analysis. Certain bike lock and locker solutions enable e-charging, thus being useful for e-bikes and e-scooters as well. The most common way of conducting a parking survey at rest is still manual research. The survey is carried out by trained workers called enumerators in the assigned areas. This method requires many workers; the error rate is caused only by the human factor, and with the number of totalizers, the probability of errors increases.
Data collection guidelines	Suggested data collections may serve for both vehicle and bike parking spaces: – Occupancy of parking lots, – parking time, – vehicle turnover rate – respect for parking fees.

Counting sensors and traffic/speed management	
Description	Counting sensors provide valuable information regarding the use and occupancy of the road. If the sensor can, besides counting, also provide classification (e.g., car, bus, truck, motorbike, bicycle, e-scooter, pedestrian, etc.), speed, and direction of the traffic, collected data can be even more helpful for traffic and speed management. There are different types of counting sensors based on different principles of measurement. Depending on the problem that needs to be solved, the method/principle should be properly chosen. Some of the most commonly methods in use are the following: - pneumatic tubes are taped down on the roadway, perpendicular to the traffic flow. When a vehicle drives over a tube, the pressure changes in the tube and a signal is sent to the counting software. With two tubes, it is possible to measure the speed and direction of the traffic. However, it is not suitable for areas with high volumes of traffic and requires certain road-construction work for the installation. A variant of this method utilizes piezoelectric sensors instead of pneumatic ones. - An inductive loop detector works on the principles of electromagnetism. Double loops can provide speed data, while in common, inductive loop detectors may not be able to sufficiently classify low metal vehicles such as motorcycles, bicycles, etc. This also requires certain road-construction work for the installation. - Video/camera-based image detection uses one or more cameras and dedicated software analyzing video-stream or pictures captured. Based on the sophistication of the system, it may provide classification of the traffic (vehicle type, bicycle, pedestrian, etc.), its direction and typically provides more accurate results even in highly congested areas than previous methods. Installation requires exact positioning of the cameras and no obstacles in their view-angle, otherwise, no road-construction works are required. The drawback of this method could be potential privacy concerns. - Thermal imaging cameras detect heat signatures and work similarly as video-based image detection. Based on the heat signature, they accurately detect and classify vehicles, pedestrians, and bicycles while also measuring speed and direction. Considering installation, similar requirements apply for video imaging, while thermal imaging raises no privacy concerns and has no issues during night-time operation. - Radar and lidar sensors are relatively new methods, while they offer more insight and accuracy than previous methods. They can determine vehicle length and use that data to accurately classify vehicles. This allows radar sensors to offer more classes than the previous methods, including pedestrians and bikes. They also detect the speed and the direction of the movement. - Infra-red sensors are simple method which only provides counting and no traffic classification, direction and speed. May be useful where type of traffic is known and the flow is predictable (e.g., bicycle lane, passage for pedestrians).
Data collection guidelines	– The number of vehicles passing through a specified profile, node or a section of communication for a certain time unit (typically an hour, a day).

	– The intensities, speed, directionality or behavior of pedestrians, cyclists and vehicle drivers

Public/Private Services database	
Description	Public and Private Services data serve as a crucial tool in data-driven decision making. They provide even more accurate data on mobility than surveys, as they present actual data for a whole population. Before starting to collect data, it is useful to see what data already exists. For that, a wider pool of data sources can be accessed, both from the public and private sector. This can be across the areas of mobility, environment, safety and accessibility. Examples for data sources: • Statistical data and academic research • Police/Local police • Mobility providers • Healthcare providers • Digital service providers, such as food delivery and other internet-based service providers relying on navigation and mobility in the city Examples for types of data: • Internal databases with raw and processed data • Open map data sources (e.g. OpenStreetMap) • Reports and studies • Analysis of qualitative and quantitative data collection Examples for data to collect: • Accident and safety metrics • Usage of mobility modes • Routes and timings • Speed and volume • User feedback • Cartographic bases and graphs (e.g. highways, sidewalks, crossings, underground station entrances and elevators, cycle infrastructure, road regulations, etc.)
Data collection guidelines	Data Quality Assurance: Prior to using the data for analysis or decision-making purposes, it is essential to verify its accuracy, completeness, and reliability. Implementing data validation and quality assurance processes is crucial to detect and correct any errors or inconsistencies. When using data, it is imperative to follow the requirements from the data owner/handler. If data usage methods are not obvious, it might be necessary to obtain explicit consent. Ensuring fairness and non-discrimination in data practices involves collecting, processing, and using unbiased data to prevent discrimination and biases while striving for inclusivity and representation. Data Protection Impact Assessments (DPIAs) are typically conducted for specific projects rather than an organization's

	entire operations. They help to identify risks early and demonstrate regulatory adherence. When reusing data, ensure that timeframes are appropriate for it to still be regarded up to date. The time of data collection should be no more than 2 years ago. When it comes to reusing data, ensure that you have the consent for accessing this data and reusing it for your purposes. This consent will need to be clear and available, typically in the form of consent forms. For synthesized data, this consent will often not be needed, as nothing can be traced back to the individual, especially when it has been worked into reports or large-scale survey outcomes, so normally this data can be accessed.

Road data from controlled intersection and related devices	
Description	To determine the intensities at monitored intersections and subsequently display load It is also possible to use recording devices other than a video camera. E.g. a stationary camera can be used to generate traffic intensity diagram recording device with subsequent automatic evaluation using software. For such types of devices, it is necessary to consider the resolution of the device and the corresponding diameter of the intersection, given by the manufacturer. Speed measurement is carried out to determine the actual speeds achieved by vehicles when passing through the intersection, considering the type of modification and its effect on speed. It is also used for mutual comparison of proposed modifications of intersections "before" and "after" the implementation of traffic engineering measures. Simultaneously measured vehicle speeds serve as input value in the capacity calculation of uncontrolled level crossings (the V85 speed percentile is used). Three monitoring methods can be used to measure speeds at intersections – continuous, profile or section measurement. All vehicles passing through a profile or section are monitored. The measurement depends on the available technique, intersection layout, local conditions and the type of data needed.
Data collection guidelines	– Directional intensities of traffic – Distances of vehicles – Time spent in the parking lots – Directional survey – Accidents

CO2 sensors, air quality sensors	
Description	Air quality meters are precise instruments for detecting and analyzing/measuring the level of various gases, particles and chemical compounds in the indoor and outdoor air. The use of air quality measuring devices enables targeted monitoring of outdoor/indoor air, supports people's health and well-being, helps identify potential sources of danger and supports the creation of a healthy and pleasant environment. For the project's purpose, sensors for outdoor use should be mainly targeted (e.g., due to weather). Besides identifying suitable locations for sensor mounting in terms of the evaluation methodology (i.e., no impact, indirect impact, direct impact), the exact micro-location of the sensor should follow installation

	guidelines recommended by the manufacturer (e.g., height of the sensor installation). In addition, potential restrictions such as power supply availability, network connectivity and method of transferring data from sensor to database should be considered before the installation in the field takes place. In the case of measuring the levels of specific pollutants which depend on any other external factor (such as the level of Ozone (O3) which depends on weather conditions), external factors and their measurement should be considered as well.
Data collection guidelines	Data considering air (gas) pollutants are presented by levels. These are read/collected in certain continuous time intervals, thus available for further statistical analysis and representation by multiple statistical parameters (e.g., average, standard deviation, median, etc.). Most common air (gas) pollutants generated by the traffic[1], include: - Level of CO2, - Level of Particulate Matter (PM) and specifically PM2.5 as one of the most common traffic related pollutants, - Level of Nitrogen dioxide (NO2), - Level of Black carbon, - Level of Carbone monoxide (CO), - Level of Ozone (O3) – the level heavily depends on weather conditions since it is formed from photochemical reactions with pollutants, i.e., the highest levels of ozone are seen during periods of sunny weather, - Level of Polycyclic aromatic hydrocarbons (PAH).
Source	World Health Organisation: Ambient (outdoor) air pollution

Public transport operational data	
Description	Public transport vehicles are usually also floating vehicles for the check-in and information system. A vehicle measures its position using GNSS and sends it to a central system for processing. Thanks to this, it is possible to get the driving course of such a vehicle in the monitored section. After adding information about the timetable, it is possible to determine the delay of the vehicle and its progress, i.e. verify the effect of negative traffic phenomena on the delay of the vehicle. Location information is also useful for the needs and motivations people have for applying for or cancelling travel passes for public transport.
Data collection guidelines	Open data inquiries
Source	

[1] Ambient (outdoor) air pollution, WHO, December 2022, https://www.who.int/news-room/fact-sheets/detail/ambient-(outdoor)-air-quality-and-health

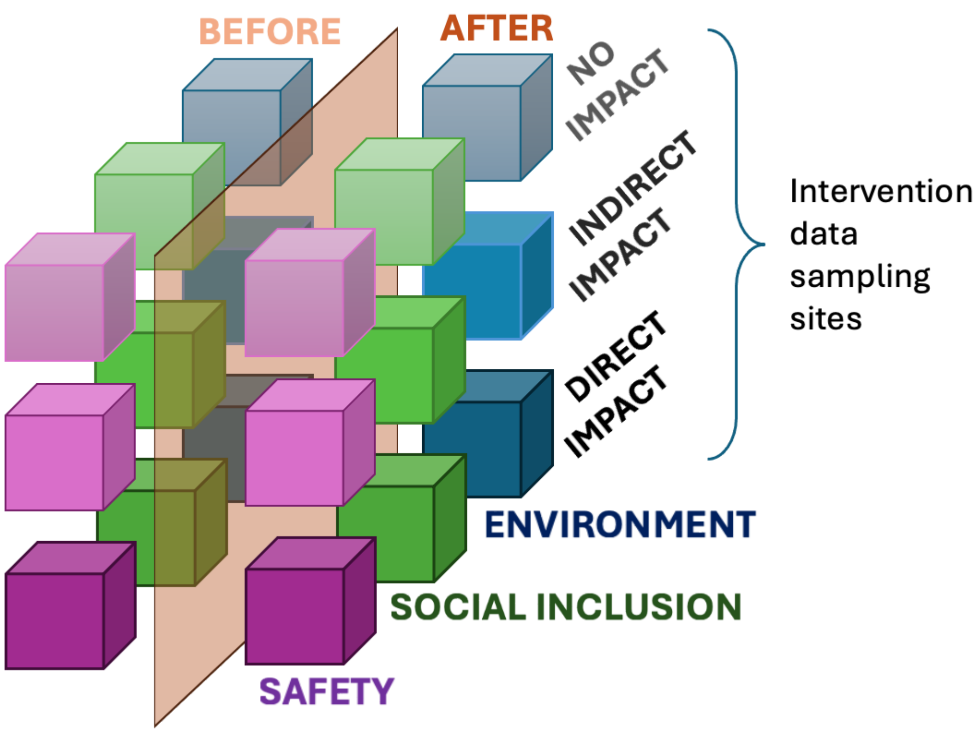
PART 3 - Intervention Impact Evaluation

An important component of the ELABORATOR project is to evaluate the short, medium and long-term impact of each Living Lab's (LL) mobility interventions as part of WP7. This evaluation needs to assess impacts across environmental, safety (physical and psychological) and social impacts, in terms of reducing GHG emissions, and increasing inclusivity and road safety. The methodology used for the impact evaluation of the project draws on the Healthy Streets Evaluation Framework[2]. More information about this Framework can be found at their website.

3.1 Analysis of intervention impacts

Data collected in each of the LLs will allow for comprehensive, 'three-dimensional' analysis and evaluation of the impacts of the mobility interventions as part of WP7. By collecting data before the intervention and after the intervention, the safety, environmental and inclusion indicators can be measured and compared. Second, these can then be analyzed and compared to locations where indirect, and no impacts are expected. This '3D' analysis is visually represented in the diagram below.

LL intervention impact analysis and evaluation



2 https://static1.squarespace.com/static/6048ed6105c2155a63b0c831/t/60c339c5ed2a953164d5e107/1623407052709/Healthy+Streets+Evaluation+Framework.pdf

To assess these impacts, each LL will need to collect data before and after the intervention(s) to allow these impacts to be measured and understood. It is also important that data is collected for a range of locations around an intervention, including:

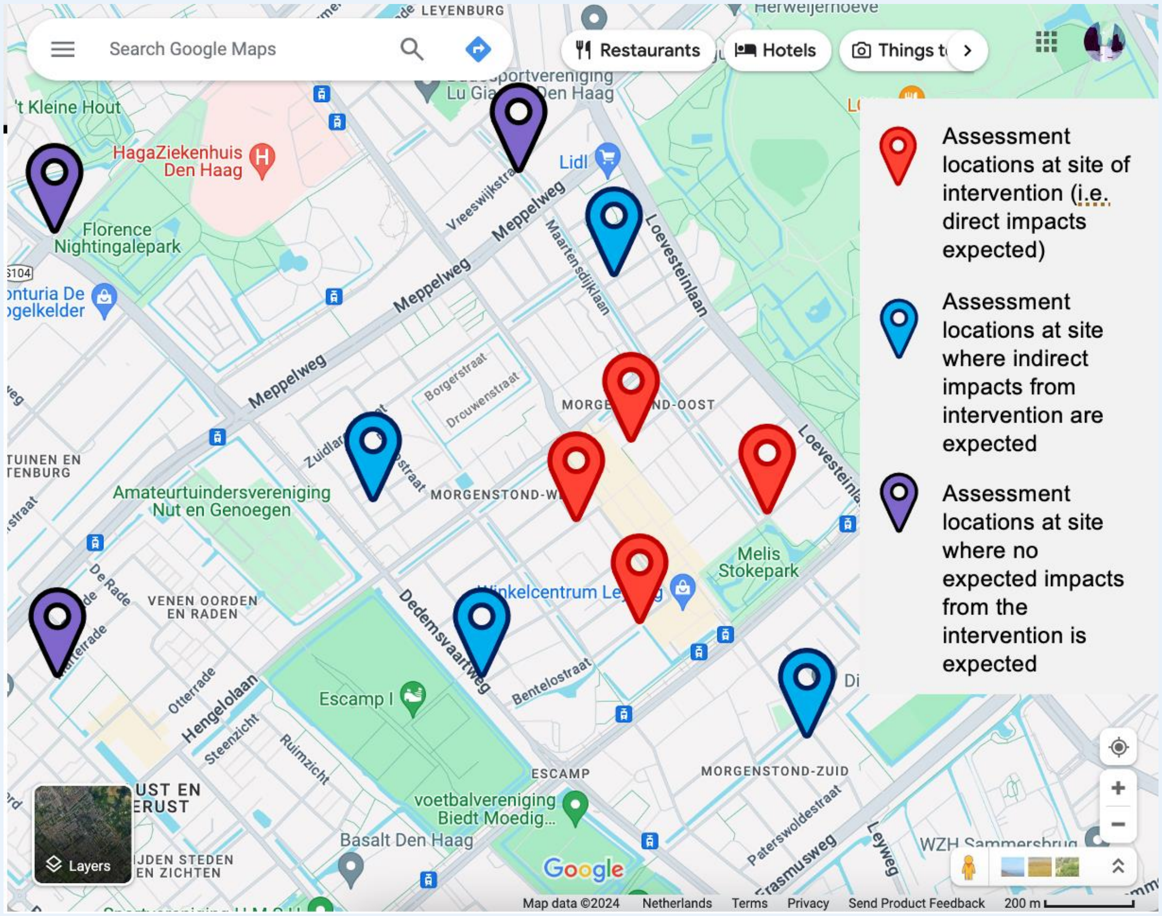
- Locations where the intervention is expected to have a direct impact
- Locations where the intervention is expected to have an indirect impact, and
- Locations where the intervention is not expected to have an impact.

Example

For example, if a LL is looking to introduce new parking restrictions for private vehicles on specific streets, then data should be collected on one or more locations:

- On the street(s) where the new restrictions apply (direct impact location)
- On the neighboring street(s) where vehicle parking restrictions are unchanged, but which might have more vehicles parking on them because of the intervention (indirect impact location); and
- On the street(s) where the new parking restrictions are not expected to have any impact (no impact location).

Example of data collection locations to assess intervention impacts



3.2 Impact evaluation methodologies

The evaluation methodologies discussed in this section will be used specifically for the short-, medium- and long-term impact evaluation of the interventions. There will be a basic and common set of indicators collected across all LLs to ensure consistency and standardization of the analysis. Impact analysis and evaluation for the LL interventions will also be supplemented by the specific outcomes defined in each LL.

3.2.1 Environmental impact evaluation methodology

The environmental impact of the LL will be assessed using an index of sustainable urban mobility (see Annex IV)[3],[4],[5]. This index is based on predefined criteria, which typically encompass factors such as air pollutant emissions, energy efficiency in mobility, noise pollution and CO2 emission mitigation. Further details concerning the criteria and the associated data required can be found in the following sections.

Environmental criteria and associated data required

This section describes the data required to process the environmental impact evaluation methodology.

Air pollutant emissions

Data	Description
Concentration of pollutant emission (NOx, PM2.5)	Such data is collected by air quality sensor
Awareness of the necessity to reduce emissions.	A percentage of the population are aware of the necessity to reduce emissions. Such information is collected by survey
Establish clear, ambitious, and achievable targets for reducing emissions from transportation	If targets for reducing emissions from transportation are set
Cycling infrastructure and bike station	km of cycling infrastructure and number of bike stations
Awareness programs, and there is a visible shift towards better practices in transport sector	Awareness campaigns towards Zero Emission Modes
Zero Emission Modes (ZEMs) %	Mode share for ZEM
Variety of data sources on pollution emissions	Number of data sources on pollution emission

Energy efficiency in mobility

Data	Description
Intermodality hubs	Presence of public transportation stations with bicycle parking slots available, bicycle-sharing infrastructure nearby or several public transportation modes and lines

[3] Costa, M. D. S. (2008). An index of sustainable urban mobility. *Unpublished PhD thesis, São Carlos School of Engineering, University of São Paulo at São Carlos, Brazil.*

[4] Silva, A. N. R. D., Costa, M. D. S., & Ramos, R. A. (2010). Development and application of I_SUM: an index of sustainable urban mobility

[5] de Freitas Miranda, H., & da Silva, A. N. R. (2012). Benchmarking sustainable urban mobility: The case of Curitiba, Brazil. *Transport policy, 21*, 141-151

Subsidies for Zero Emission Modes	Total potential number of subsidies for Zero Emission Modes
Public awareness towards subsidies for Zero Emission Modes	Percentage of the population aware of the existence of subsidies for Zero Emission Modes (if present)
Bicycle-sharing stations	Number of public bicycle-sharing stations
Bicycle parking	Number of bicycle parking spots
Bicycle network	Km of bicycle infrastructure
Deployment of electric vehicles and ZEMs in public transportation fleet	% of electric vehicles or ZEMs in the public transportation fleet
Waiting times of motorized vehicles	The mean amount of time out of motion of motorized vehicles using the street
Operating speed of motorized vehicles	The 85th percentile and mean speed of the motorized vehicles using the street

Noise pollution

Data	**Description**
Noise pollution data collection	If data is collected concerning noise pollution
Vehicle flow (AADT)	The number of motorized vehicles using the street
Deployment of electric vehicles and ZEMs in public transportation fleet	% of electric vehicles or ZEMs in the public transportation fleet
Subsidies for Zero Emission Modes (ZEMs)	Total potential number of subsidies for Zero Emission Modes (ZEMs)
Design of “Hush-zones”	If only non-motorized modes of transportation (e.g., pedestrians, bicycles) are allowed in the intervention zone

CO2 emission mitigation

Data	**Description**
CO2 related public awareness campaigns	If there are CO2 related public awareness campaigns
CO2 emission reduction targets	If there are CO2 emission reduction targets defined
Zero Emission Modes (ZEMs) %	The proportion of crossings using ZEMs in the street
Subsidies for Zero Emission Modes (ZEMs)	Total potential number of subsidies for Zero Emission Modes (ZEMs)
Green areas	Surface allocated to green areas in the intervention zone
Intermodality hubs	Presence of public transportation stations with bicycle parking slots available, bicycle-sharing infrastructure nearby or several public transportation modes and lines
Vehicle flow (AADT)	The number of motorized vehicles using the street
Financial support to a circular economy	If there are financial initiatives to support circular economy

3.2.2 Social impact evaluation methodology

To compose the social impact evaluation methodology for ELABORATOR living labs, the main consideration was the inclusivity and accessibility of public space and urban mobility, which can ensure socially diverse spaces and services.

A first workshop with project partners to discuss the various ways in which accessibility can be expressed in the urban environment brought a collection of references for accessibility in designing urban spaces and access to services. Within these two categories, the references and sources investigate how to ensure accessibility and inclusivity considering:

- Diversity in socio-economic backgrounds,
- Diversity in physical and cognitive abilities
- Diversity in cultures
- Diversity in genders
- Diversity in age

The detailed outcomes of the workshop are presented in Annex V

Complementary to the workshop results and sources are the work and references from the D1.2 Inclusion Plan, which covers a set of Key Indicators and additional references on how to ensure inclusivity and accessibility. Moreover, the D1.2 Inclusion Plan is a guide for all the different phases of the project, including evaluation. Therefore, the social impact evaluation methodology is intertwined with the D1.2 Inclusion Plan.

All the references and sources that emerged from the workshop have their specific relevance to ELABORATOR and can be used in specific cases for more detail or specific needs. However, to create a methodology that could be universally applicable by the different LLs and that can be easily linked with the environmental and safety impact evaluation methodology, our main reference points are the resources from the UN-Habitat Public Space Programme, with city-wide[6] and site-specific assessment[7]guidelines. Other main sources used as references are the ITDP Complete Neighborhoods for Babies, Toddlers, and Their Caregivers[8] guide and the UNICEF Toolkit on Accessibility[9] . These comprehensive guides and resources rely on universal design principles, observation, people counting, interviews, focus groups, mapping and other tools to bring representation in assessing inclusivity and accessibility.

UN-Habitat Public Space Site-specific Assessment guidelines provide invaluable references and guidance for cities to assess and improve the quality of public spaces that should be safe, inclusive, accessible, and green. It is divided into phases and provides indicators within the dimensions of accessibility, green environment, comfort and safety, amenities and use and users. It is designed to be used in combination with the City-Wide Public Space Assessment Toolkit to provide a more reliable picture of the current status and create new quality frameworks that will support the creation of socially inclusive, integrated and connected, sustainable and safe streets and public spaces, especially for people in vulnerable situations.

Moreover, the Site-specific document uses the learning from established research on the topic, presenting in detail how to execute, when and why activities such as stakeholder mapping, interviews, surveys, observations, mapping, prioritizing goals, exploratory walks, etc. It also sets references for walkable radius, the set-up of expert design studios and examples of maps, use cases and more. The document has a global perspective, so it also works within different city contexts, as is the case with ELABORATOR LLs.

As the example of the mentioned references, the primary data source for the impact evaluation methodology is the observation of the public space, complemented by some desktop research and possible interviews or focus groups. Interviews and focus groups are particularly relevant to groups that are in vulnerable situations so they can share their perceptions and experiences that might be understated within simple observations. Many social aspects can only be fully understood if different perspectives are considered and the reason why the D1.2 Inclusion Plan is relevant as a cross-reference. To ensure real inclusivity and accessibility, the nuances and perceptions of different user groups must be considered to avoid the reproduction of underlying settings that lead to the exclusion and vulnerability of certain groups.

Below is a simple example of the categories and the main indicators for the social impact evaluation methodology. The main indicators are complemented by sub-indicators and questions that look more into the details of the categories to allow for a more comprehensive assessment.

Categories	Indicators
Use and users	Number and variety of **users** accessing the public space
	Number and variety of activities observed in the public space at different times and locations
Accessibility	Accessibility of parking facilities
	Accessibility and inclusivity of **bike** infrastructure
	Accessibility and inclusivity of pedestrian infrastructure

[6] https://unhabitat.org/sites/default/files/2020/07/city-wide_public_space_assessment_guide_0.pdf, 2020
[7] https://unhabitat.org/sites/default/files/2020/07/final_pssa_v.1_reviewed_compressed.pdf
[8] Institute for transport and development policy, Complete Neighborhoods for Babies, Toddlers, and Their Caregivers, https://itdp.org/wp-content/uploads/2021/10/Design-Essentials-single-1.pdf
[9] UNICEF, Toolkit for Accessibility, 2022, https://accessibilitytoolkit.unicef.org/media/536/file

	Street Permeability
	Accessibility to mobility services
	Accessibility to public spaces (recreational, parks, etc)
	Presence and quality of **lighting**
	Presence and quality of **seating**
Amenities and furniture	Presence and quality of **waste bins**
	Presence and quality of **signage**
	Presence and quality of **water and toilets facilities**
Comfort and safety	Perception of **safety** & level of **security** of the public space
	Overall comfort using the public space, through maintenance, design and ambient conditions

3.3.3 Safety impact evaluation methodology

The iRAP road safety assessment methodology will be used to evaluate the safety of the mobility interventions implemented in the ELABORATOR project. It will do this by:

- Using safety Star Ratings to measure the change in the safety level before and after mobility interventions in the ELABORATOR project, and
- Predicting the medium and long-term changes in fatal and serious injury crashes (FSI) using the iRAP FSI Estimation tool.

Using Star Ratings and FSI Estimations for before and after assessments of interventions enables a comparison of these predictions without having to wait for new crash data, hence providing a more immediate proactive safety evaluation.

Safety Star Ratings

★★★★★ 5 Star (low risk)
★★★★ 4 Star
★★★ 3 Star
★★ 2 Star
★ 1 Star (high risk)

About iRAP Star Ratings

Star Ratings are a predictive and objective measure of:

- How likely it is a road crash will occur for an individual road user, based on the speed, volume and physical features of a road, street, or intersection, and
- The severity of the outcome when a crash does occur.

The Star Rating models consider the contribution of both infrastructure and operational elements and their contribution to the likelihood and/or severity of road crashes. Star Ratings are a measure of individual risk to road users, by road user type (vehicle occupant, motorcyclist, bicyclist, and pedestrian).

About FSI Estimations

Once the Star Rating of a road is known, these are then used in conjunction with the number of road users (i.e. exposure) and crash history to estimate how many fatal and serious injuries (i.e. collective risk) will occur at a location, a street (whole or part thereof) or road network. The change in FSIs can be estimated for medium-term (e.g. 5-10 years after the intervention is implemented), as well as long-term (10-20 years after the intervention is implemented).

What data do safety Star Ratings and FSI Estimations require?

Star Ratings require features about a road to be recorded in a spreadsheet which is then used to calculate the Star Rating for each road user type. For the most part, the features about a road are given a numerical code. The full list of data required to calculate Star Ratings for all road user types (i.e. pedestrians, bicyclists, motorcyclists, and vehicle occupants) is at Attachment A.

If Star Ratings are only required for some road user types (e.g. only pedestrians and/or bicyclists), then not all fields are required. Full data definitions, specifications and coding guidance are provided in the *iRAP Coding Manual* [10].

FSI Estimations require the same data as Star Ratings. Where available, FSI Estimations benefit from knowing how many FSI crashes have happened in the location being assessed. However, this is not essential.

Broadly the data needed for a Star Rating can be grouped into three categories:

- Data about the physical features of the road, street, or intersection
- Data about the types and number of road users (i.e. mode of transport), and
- Data about the speed of motorized vehicles.

The full list of data requirements is in the tables below.

Data about the physical features of the road, street, or intersection

Road details and context

Date of inspection
GPS location
Name/s of streets
Land use
Area type
Other locational information

[10] iRAP Coding Manual, accessed 30.04.2024, https://resources.irap.org/Specifications/iRAP_Coding_Manual_Drive_on_Left.pdf?_gl=1*hoqbz2*_ga*MTI3ODY4MDIzNi4xNzE0NDgyMzU5*_ga_HK6PSM29PR*MTcxNDQ4MjM1OC4xLjAuMTcxNDQ4MjM1OC4wLjAuMA..

Mid-block attributes

Number of lanes	How many lanes the street has (per direction)
Lane width	How wide the traffic lanes are
Curvature	If there are curves/corners in the street
Quality of curve	Whether there are signs or similar to warn people about the curve
Median type	What is separating the opposing flows of traffic
Skid resistance	How much grip the street surface has (e.g. if there is loose gravel or metal plates)
Road condition	What the surface condition of the street is (e.g. if there are potholes)
Vehicle parking	If there is vehicle parking on one or both sides of the street
Grade	If the street is on a hill or slope
Sight distance	If drivers are able to see ahead clearly (e.g. if their ability to see pedestrians about to cross the road is obstructed by buildings or trees)
Delineation	If there are lines on the street to separate traffic lanes
Street lighting	If there is lighting on the street
Property access points	If there are driveways present

Roadside attributes

Roadside hazards	The safety features or hazards present beside the street
Paved shoulder	The space between the traffic lanes and the curb

Intersections (if present)

Intersection type	The type of intersection (e.g. number of 'legs', presence of traffic lights and turning lanes)
Intersection quality	How well drivers can anticipate and navigate the intersection
Intersection channelization	The presence of traffic islands to help channel traffic travelling through an intersection
Intersecting road volume	The number of vehicles entering the intersection from side streets

Vulnerable road user (VRU) facilities and land use

Pedestrian crossings	The presence and features (e.g. signals) on the street and side street (if present)
Pedestrian crossing quality	How well drivers can anticipate the crossing and how well pedestrians can access and use the crossing
Pedestrian channelisation	Features which 'channel' pedestrians toward formal crossing points
Sidewalks	The presence of footpaths on one or both sides of the street
Bicycle facilities	The presence of bicycle lanes or paths along the street
School zone warnings and supervisors	The presence of features which indicate to drivers they are passing a school

Data about the types and number of road users (i.e. mode of transport)

Road user flows

Vehicle flow (AADT)	The number of motorized vehicles using the street
Motorcycle %	The proportion of motorized vehicles which are motorcycles or powered two-wheelers (PTWs)

Heavy Good Vehicle (HGV) %	The proportion of motorized vehicles which are trucks or buses
Pedestrian flow	The number of pedestrians walking along each side of the street and crossing the street
Bicycle flow	The number of bicyclists using the street

Data about the speed of motorized vehicles.

Speed

Speed limit	The maximum legal speed for motorised vehicles
Operating speed	The 85th percentile and mean speed of the motorized vehicles using the street
Speed management	The presence of traffic calming devices or similar which are designed to reduce traffic speed

How is data for a safety Star Rating collected?

The data can be collected using simple, manual methods without the need for sophisticated technology or software. Data may also be acquired from data providers or collected using sensors etc.

How the data is best collected depends on the amount of data required for the assessment, that is, the number of locations, length of the road or size of the road network being assessed. The full list of data collected is in Annex III.

There are two ways Star Ratings can be done: Spot assessments or length-based assessments.

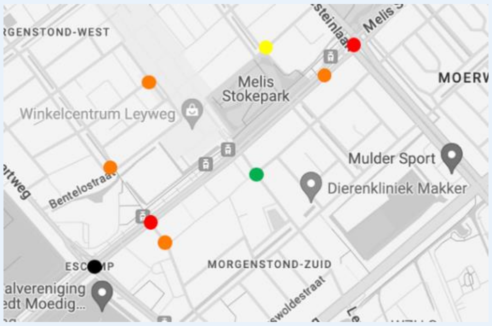
Spot assessments

Spot assessments are where a single location is assessed. This is useful for assessing an intersection or midblock location and can be used in a series (e.g. every intersection and one mid-block location) along a road or street corridor or across a network.

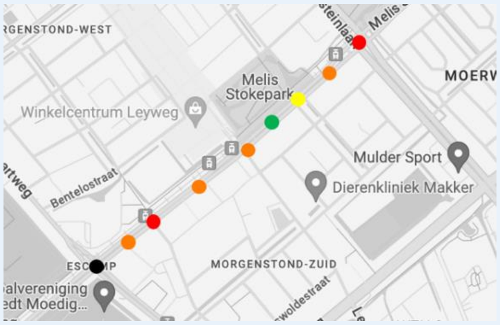
Spot assessments are the easiest type of assessment. They can be done using photos of the location and recording the physical features of the location directly into an online form (e.g. a Google Form or similar), or using one of iRAP's tools, such as the Star Rating Demonstrator or Star Rating for Schools app.[11] Speed and road user flow data can also be collected onsite manually, via sensors or from a data provider.

The results appear as a series of 'spots' on a map as per the examples below.

Example of spot assessments used to assess intersections across a street network



Example of spot assessments used along a street at intersection and midblock locations



Length-based assessments

[11] These tools automatically convert the data into the correct numerical codes and produce the Star Rating which minimises any technical expertise or training required for the data collection.

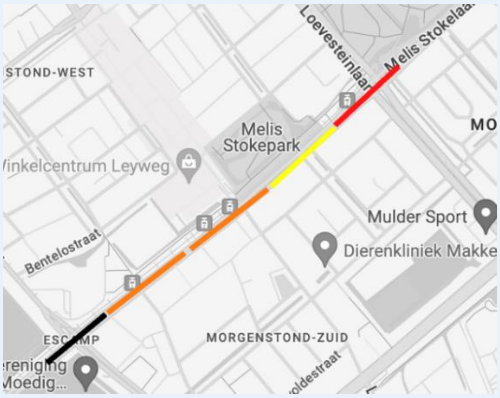
Length-based assessments are where data is continuously collected along a road, street or across a road network. Typically, video footage is taken (from a vehicle or bicycle), and this is used to record the physical features of the road, street or network per segment (typically 100m in length, but the segments can be reduced for dense urban road networks).

Speed and road user flow data can also be collected manually, via sensors or from a data provider. In the case of manual counts or using sensors, this can be done across a sample of locations (i.e. more like spot assessments) and are extrapolated for the full length of the assessed road, street, or network. Depending on the data source, providers may have continuous data for the selected roads, streets, or network.

This data is then put into a spreadsheet (MS Excel or similar), where one line of data equates to one road segment, via a coding tool or similar, and then processed in iRAP's ViDA tool. Length-based assessments are more involved and typically require support via training or qualified personnel. iRAP and EIRA can provide this support to ELABORATOR partners.

The results appear as colour-coded lines on a map as per the example on the right.

Example of a length-based assessments along a street



PART 4 – Living Lab Intervention Evaluation Template

4.1 Description of the intervention

WHAT YOU NEED TO DO
Use the template to fill in the description about your intervention. Descriptions for each item in the table are found in Part 2 of the Evaluation Plan Framework.

Template

Intervention description	
Overall description	
Elements	
Main users	
Boundaries	

Area and location	

4.2 Developing evaluation goals

WHAT YOU NEED TO DO
You will need to fill a canvas of your Theory of Change. It is the same that was used for the workshop in Issy. Those are good starting points to complete and tidy up your Theory of Change. 1. Download and print another canvas in your office OR use it digitally by downloading it on your computer and using PDF reader to fill the boxes. 2. Complete all sections, ensure that everything is well connected and there are no “free flowing” items on the canvas. 3. Take a picture (Do not upload it for now). 4. Fill the information into the template “Theory of Change”. This is highly recommended to be done after you have gone through the canvas and prioritized your project goals.

Canvas

“Theory of Change”, download here

Template

Theory of change						
Challenge	• Bullet points					
Solution 1	Short term impact		Medium term impact		Long term impact	
Solution 2	Short term impact		Medium term impact		Long term impact	
Solution 3	Short term impact		Medium term impact		Long term impact	
Vision						

4.3 Choosing indicators

WHAT YOU NEED TO DO
Pick the indicators for your project. For the impact KPIs, look which ones are relevant for your city and see which element of your intervention is best suited in measuring this data. If there is a mandatory KPI but you do not have an impact that matched that outcome, you might need to consider adding elements to your solution that will create that impact. And it is always good to talk to the project management about this: Jason (ICCS), Hans (Technical manager), Monica & James (WP7 leaders) 1. Identify indicators and write them next to the impact on your canvas. 2. If you have KPIs that are mandatory for your city but no impact to address them, you will need to return to the previous step and add elements to your intervention that will enable you to achieve those outcomes of the KPIs. 3. If you are very unsure on how to address these KPIs, please reach out to the project management team with contacts listed above. 4. For the SUMIs, make sure to pick at least one per evaluation area. 5. Outside of that, pick as many indicators as you think is useful. Keep in mind that you will need to evaluate the impact of your intervention in WP7, so the more indicators and data you collect, the more certain you can be of achieving a successful evaluation. 6. Every indicator has a fully detailed description provided in the Annex. 7. Feel free to think of other indicators not part of the provided list. Please use the “light blue” template when describing them. 8. Once you have decided on the indicators, use the template “Evaluation indicator”. Copy and paste as many templates as you need and fill one template for each indicator, including the KPIs. 9. Take a second picture of the canvas (including the indicators) and upload it into the indicated area on your City Plan

Templates:

Elaborator Impact KPIs	
Name	
Result of the evaluation	
Unit	
Method selected	
Scale of measurement	
Periods for data collection	
Additional comments	

SUM indicator	
Name	
Result of the evaluation	
Unit	
Method selected	
Scale of measurement	
Periods for data collection	
Additional comments	

Other indicator	
Name	
Result of the evaluation	
Unit	
Method selected	
Scale of measurement	
Periods for data collection	
Additional comments	

4.4 Selecting data collection methods

WHAT YOU NEED TO DO NOW

For each indicator, choose the appropriate methods to collect data. Often, it is good to have both qualitative and quantitative data for an indicator so that you can get a more accurate picture. A list of suggested qualitative and quantitative data collection methodologies is provided below. Each of them has guidelines attached. These guidelines should help collect data the right way to be used for evaluation purposes. Feel free to also choose others, these here are just suggestions. It might still be useful to look at the guidelines for our suggested methodologies, as they might be applicable for your own methodologies, too. Select methodologies making sure every indicator has a method allocated. It is possible to use the same method, or the data collected for multiple indicators Fill in the template "Data collection methodologies". Copy and paste as many as you need to fill one template for each methodology

Template:

Data collection methodology	
Name of the methodology	
Type of data collected	
Evaluation indicators addressed	
Resources and equipment needed	
Timeline for data collection	

PART 5 - Living Lab Data Collection

5.1 Preparing to collect data for the LL intervention

The online form for conducting the assessment of the Safety/Accessibility/Environment Rating System is linked in Annex VI.

5.1.1 When to collect data?

At a minimum, data needs to be collected both before and after the intervention. It may also be valuable to collect data at intervals (e.g. weekly or monthly) during the implementation of the intervention to understand initial impacts and how these may change over time.

For example, if a new bicycle sharing scheme is being introduced, it could be worthwhile to measure changes in mode share of bicycles over time to gain a better understanding of the immediate impact and subsequent impacts once the scheme is introduced, and the impacts of any adjustments over time (for example, an increase in the number of bikes available).

It may not be practical or necessary to collect all data repeatedly, especially for data about those features which are unlikely to vary significantly on a weekly or monthly basis such as the infrastructure. For example, if there is a new bicycle path being installed, data on the physical infrastructure can be collected once before and after, whereas the number of road users by mode could be continuously monitored (or monitored at intervals) during the life of the project.

5.1.2 Where to collect data?

As explained in the introduction to this section, it is important for the impact analysis and evaluation of the intervention that data is collected in locations which will be:

- Directly impacted by the intervention,
- Indirectly impacted by the intervention, and
- Where no impact is to be expected.

Selecting data collection sites to measure direct impacts

The number of locations to collect data is determined by the intervention's scale. For interventions at very specific locations, such as the reconfiguration of a pedestrian crossing at an intersection, only one data collection point may be required. For interventions that affect a street or network of streets, such as introducing new speed limits, several data collection points may be necessary at both intersection and mid-block locations.

Selecting data collection sites to measure indirect impacts

The selection of data collection points where indirect impacts are anticipated will be largely determined by the type of intervention and the street network. This could include indirect impacts such as more or fewer private vehicles using the street, increased pedestrian and/or bicycle activity, changes in traffic speed or volumes, etc.

In cases where interventions are very specific to a single location, it may be reasonably assumed that it will not have any indirect impact on nearby locations. Where indirect impacts are expected, several data collection points may be necessary at both intersection and mid-block locations.

Selecting data collection sites where no impacts are expected

Regardless of the scale of the intervention, it is essential data is collected for locations where no impacts are expected. This will help compare the impact of the intervention with similar locations where no intervention has been made.

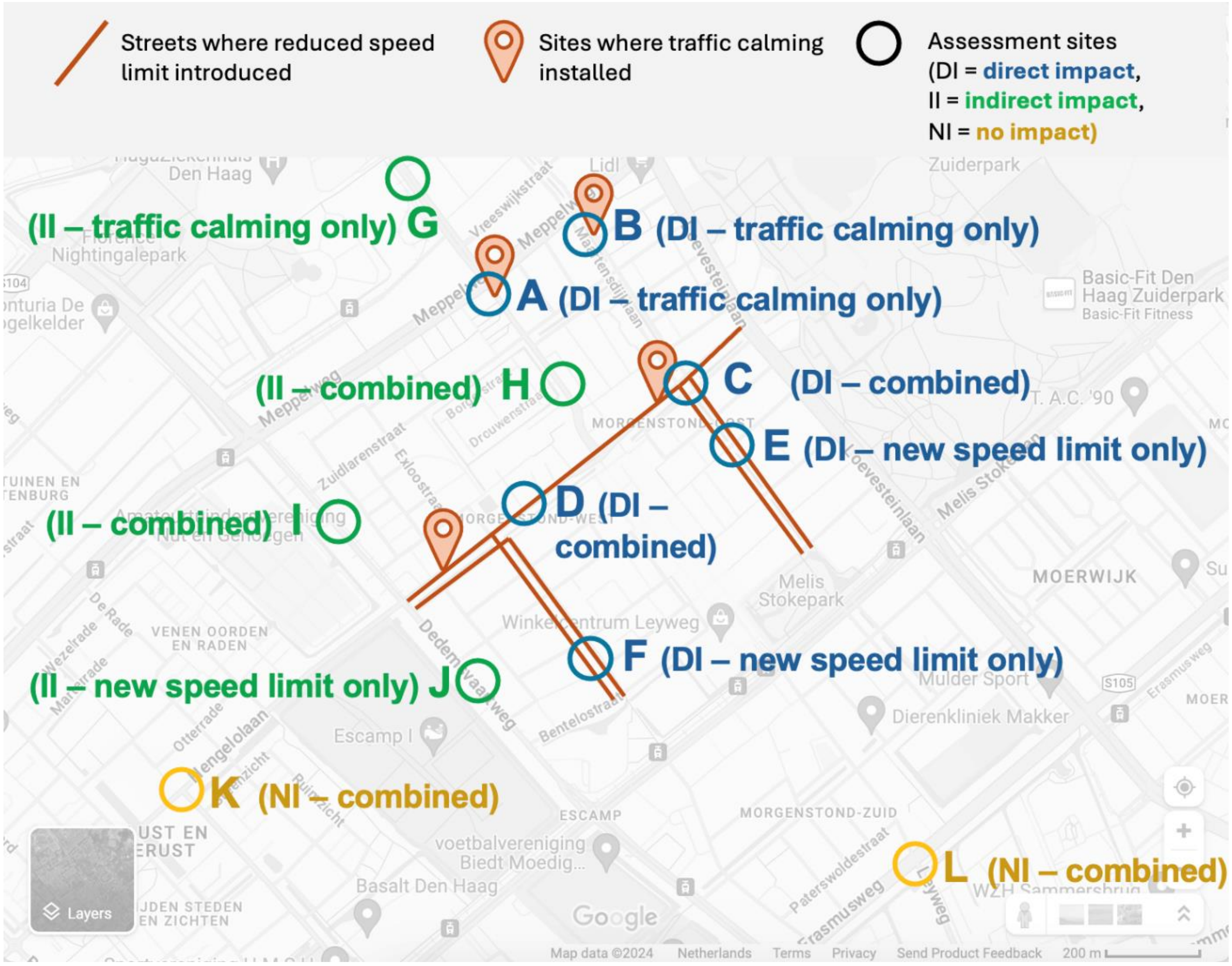
Select data collection sites on streets or at intersections which have similar characteristics to those of the intervention location. These may be streets with similar traffic volumes, traffic speeds, modal split and land use (such as the presence of shops or schools). It is recommended that several locations are selected to avoid unintended changes at one location disproportionately impacting the analysis.

Collecting data for multiple interventions affecting the same locations

Where multiple interventions are planned which are expected to have common areas of direct and indirect impacts, data collection locations may need to be tailored to assess both the combined impact of all interventions, as well as the individual impact of each where they do not completely overlap.

For example, if a LL will introduce reduced speed limits across a network of streets, but install traffic calming on one of the streets affected by the speed limit reduction, and on a second street without speed limit reductions, then the data collection locations should include:

- Locations where the direct, combined impacts can be measured for the street with speed limit reductions and traffic calming (C and D on the map below)
- Locations directly impacted by the installation of traffic calming without a reduction in speed limit (A and B on the map below)
- Locations directly impacted by the speed limit reduction where no traffic calming is installed (E and F on the map below)
- Locations with no interventions but where indirect impacts are expected from one or both interventions (G, H, I J on the map below), and
- Locations where no impacts are expected from either intervention (K and L on the map below).



It is important to note that in the cases where direct impacts of only one or the other intervention are being measured, these may still be indirectly affected by the other interventions. For example, it could be reasonable to assume that location E above could be indirectly affected by the traffic calming measures on the adjoining street. In this case, results impacts can be compared to other locations which are also expected to be indirectly impacted by one or both interventions (e.g. locations G, H, I or J above).

Repeat assessments

As the project requires data collection before and after the intervention(s), data will need to be collected for each location at least twice. It is essential that the locations of these assessments are the same. The specific data collection site should be described well, so that those collecting data on future occasions know the specific location and aspect. For example, if data is being collected for an intersection, the following information should be recorded upon the first assessment to make it easier for subsequent assessment(s):

- The names of the intersecting roads
- Which road is considered as the main road
- Which intersecting road is identified as the side road (especially if there is more than one side road)
- The specific location(s) where the assessor did the on-site assessments (this can affect the ability to compare photos taken etc.)

For subsequent assessment(s), the photos and data from previous assessments should be available to the assessors. Where data about the physical features of the environment is being collected again, the original data should be reviewed and adjusted based on changed conditions. This reduces the chance of differences in assessor perceptions and errors affecting the data inputs (and hence the results).

5.1.3 What data to collect?

The following data will be collected at the LL assessment sites. This data will be used to measure and monitor the safety, environmental and social impacts.

LL assessment site details and context	**Required for all sites**
Date of inspection	Automatic based on survey submission (and if it is being done before or after the intervention)
GPS location	Coordinates for assessment location
Land use	Within 400m
Area type	
Other locational information	E.g. what intervention the site relates to and if it is a direct/indirect/no impact site
School	Presence of educational facilities and associated traffic safety features
Bicycle facility presence	If there is a bicycle path or lane
About the street	**If the site is a street or intersection open to general traffic**
Name/s of streets	
Number of lanes	How many lanes the street has (per direction)
How busy the street is	Level of congestion
Median type	What is separating the opposing flows of traffic
Lane width	How wide the traffic lanes are
Delineation	If there are lines on the street to separate traffic lanes
Road condition	What the surface condition of the street is (e.g. if there are potholes)
Skid resistance	How much grip the street surface has (e.g. if there is loose gravel or metal plates)
Vehicle parking	If there is vehicle parking on one or both sides of the street
Vehicle parking purposes	Specific purposes (e.g. EV charging or disabled parking)
Sight distance	If drivers can see ahead clearly (e.g. if their ability to see pedestrians about to cross the road is obstructed by buildings or trees)
Paved shoulder	The space between the traffic lanes and the curb
Roadside hazards	The safety features or hazards present beside the street
Grade	If the street is on a hill or slope
Curvature	If there are curves/corners in the street
Quality of curve	Whether there are signs or similar to warn people about the curve
Property access points	If there are driveways present
About the footpaths	**If the street or intersection has pedestrian facilities**
Sidewalks	The presence of footpaths on one or both sides of the street
idewalk features	What features are present on footpaths
Sidewalk width	How wide the footpaths are
Sidewalk condition	If the footpath is free of obstacles and well maintained
About the intersection	**If the site is a road intersection**
Intersection presence	If there is an intersection on the street
Intersection type and features	The type of intersection (e.g. number of ‘legs’)
Signals	The presence of traffic lights
Turning lanes	The presence of dedicated turning lanes
Channelization	The presence of traffic islands to help channel traffic travelling through an intersection
Side street number of lanes	The number of lanes per direction
How busy the side street is	Level of congestion
About the pedestrian crossing	**If the side has pedestrian crossings (streets and intersections only)**
Pedestrian crossing	The presence and features (e.g. signals) on the street
Signal times	How long signalised crossings allow for pedestrians to cross

Pedestrian crossing quality	How well drivers can anticipate the crossing and how well pedestrians can access and use the crossing
Use and compliance	Are pedestrians crossing where and when they should
Presence of people crossing	Observed crossings irrespective of whether there is a formal crossing
Distance to (next) nearest crossing	How far it is to the next crossing (irrespective of whether there is a formal crossing at the LL site)
Side road crossing	The presence and features (e.g. signals) on the side street (if intersection is present)
Pedestrian channelisation	Features which 'channel' pedestrians toward formal crossing points
About the speed of the traffic	
Speed limit	The maximum legal speed for motorised vehicles
Operating speed	The 85th percentile and mean speed of the motorized vehicles using the street during both off-peak and peak times
Speed management	The presence of traffic calming devices or similar which are designed to reduce traffic speed
Quality and amenities of the site	
Main function of the site	The primary function of the site (in terms of movement and/or place)
Street lighting	The presence and quality of lighting on the street
Safety of design	Anything that the assessor notes as being a potential safety issue for all or some users
Amenities	The presence of amenities (e.g. seating, walkways etc)
Navigational support	The presence of maps and signs to help people navigate the site
Noise level	How noisy the site is
Natural features	The presence of gardens, trees, water features, etc.
Shade cover	The presence of trees or other shade provision
Maintenance	The presence of poor maintenance or other evidence of vandalism etc.
Recreational facilities	The presence of equipment for play, exercise etc.
Safety or security issues	Any record of safety and securities incidences
Bicycle facilities	The presence of bicycle lanes or paths
Number and variety of users	
Pedestrian flows	The number of pedestrians entering the site/street during peak times
Bicyclist flows	The number of bicyclists entering the street/site during peak times
E-scooter flows	The number of e-scooters entering the street/site during peak times
Diversity	Age, gender and ethnic diversity of the pedestrians and cyclists
AADT	The average daily number of motorized vehicles using the street
Motorcycle %	The proportion of motorized vehicles which are motorcycles or powered two-wheelers (PTWs)
HGV %	The proportion of motorized vehicles which are trucks or buses

5.1.4 How to collect data?

A simple tool (Google Form or similar) will be provided to the cities to collect this data. It is important to note that the data collected here may be used for monitoring several indicators, such as both safety and environmental indicators.

Collecting road user flow data

Counts of the number and type of road users (e.g. cars, trucks, buses, pedestrians, bicyclists, e-scooters, etc.) are required for each of the LL assessment sites to monitor the any changes following the intervention (compared to before the intervention).

Technologies may be available to assist with this. The two main types are:

- Automatic Traffic Counters (ATC): These are vehicle sensors attached to bicycle paths or streets. ATCs can count the number of vehicles using a particular path or street but cannot distinguish between vehicle types. For example, if there is an ATC on a bicycle path, it will be able to count the overall number of two-wheelers but not distinguish between mopeds, bicycles or e-scooters.

- Camera-based sensors: These are typically fixed cameras on streets or intersections which can automatically detect and identify the number and type of vehicles using Machine Learning, among other things. It is important that detection algorithms can accurately identify all types of vehicles. Validation against manual counts should be done prior to implementation if the technology has not been used by the city before.

Road user counts can also be done manually. Instructions for how to do this are at Annex II: Manual road user counts.

ATCs and camera-based sensors have the advantage of being able to continuously monitor traffic levels, which is far more accurate than manual counts alone.

It is possible to use both ATCs and manual counts together. In this case, ATCs can be used for overall traffic numbers, and the manual counts to identify particular road user groups. For example, if an ATC count shows a bicycle path carries 3000 two-wheelers per day, manual counts can give an indication of what proportion of these are regular bicycles, mopeds and e-scooters.

Collecting traffic speed data

The speed of motorized traffic is also an important safety indicator. Similar to counting the road users, there are technologies such as speedometers and camera-based sensors which can assist with collecting traffic speed data.

If these devices are not available, speed can be measured manually. Instructions for how to do this are at Annex III: Measuring traffic speed.

It is important to capture speed during peak and off-peak times. Only record vehicles travelling straight ahead. Do not record speed limited vehicles (such as small motorcycles or mopeds), or vehicles which are turning or stopping at the intersection or pedestrian crossing.

References

1. WHO (2022). Ambient (outdoor) air pollution. Retrieved on 30.04.2024 from https://www.who.int/news-room/fact-sheets/detail/ambient-(outdoor)-air-quality-and-health
2. Healthy Streets (2024). Evaluation Framework. Retrieved on 30.05.2024 from https://static1.squarespace.com/static/6048ed6105c2155a63b0c831/t/60c339c5ed2a953164d5e107/1623407052709/Healthy+Streets+Evaluation+Framework.pdf
3. Costa, M. D. S. (2008). An index of sustainable urban mobility. Unpublished PhD thesis, São Carlos School of Engineering, University of São Paulo at São Carlos, Brazil.
4. Silva, A. N. R. D., Costa, M. D. S., & Ramos, R. A. (2010). Development and application of I_SUM: an index of sustainable urban mobility. Sao Paolo: University of Sao Paolo. Retrieved 31.05.2024 on https://www.researchgate.net/publication/277124018_Development_and_application_of_I_SUM_an_index_of_sustainable_urban_mobility
5. de Freitas Miranda, H., & da Silva, A. N. R. (2012). Benchmarking sustainable urban mobility: The case of Curitiba, Brazil. Transport policy, 21, 141-151. Retrieved on 31.05.2024 on https://ideas.repec.org/a/eee/trapol/v21y2012icp141-151.html
6. UN Habitat (2020). City-wide public space assessment guide. Retrieved on 30.04.2024 from https://unhabitat.org/sites/default/files/2020/07/city-wide_public_space_assessment_guide_0.pdf
7. UN Habitat (2020). Public space site-specific assessment. Retrieved on 30.04.2024 from https://unhabitat.org/sites/default/files/2020/07/final_pssa_v.1_reviewed_compressed.pdf
8. Institute for transport and development policy. Complete Neighborhoods for Babies, Toddlers, and Their Caregivers. Retrieved on 30.04.2024 from https://itdp.org/wp-content/uploads/2021/10/Design-Essentials-single-1.pdf
9. UNICEF (2022). Toolkit for Accessibility. Retrieved on 30.04.2024 https://accessibilitytoolkit.unicef.org/media/536/file
10. IRap (2022). iRAP Coding Manual. Retrieved on 30.04.2024 from https://resources.irap.org/Specifications/iRAP_Coding_Manual_Drive_on_Left.pdf?_gl=1*hoqbz2*_ga*MTI3ODY4MDIzNi4xNzE0NDgyMzU5*_ga_HK6PSM29PR*MTcxNDQ4MjM1OC4xLjAuMTcxNDQ4MjM1OC4wLjAuMA
11. Laureshyn and Varhelyi (2020). The Swedish Traffic Conflict Technique, Observer's manual. Retrieved on 30.04.2024 from LIB_Laureshyn_Varhelyi_2020.pdf (ictct.net)
12. European Commission Directorate General for Transport (2021). Road safety thematic report – Speeding. Retrieved on 30.04.2024 from https://road-safety.transport.ec.europa.eu/system/files/2021-07/road_safety_thematic_report_speeding.pdf
13. Kim Y, Choi B, Choi M, Ahn S and Hwang S (2024). Enhancing pedestrian perceived safety through walking environment modification considering traffic and walking infrastructure. Public Health. 11. Retrieved on 30.04.2024 from https://doi.org/10.3389/fpubh.2023.1326468
14. Ellen McArthur Foundation (2024). Circular Economy in Cities: Opportunity and benefit factsheet. Retrieved on 30.04.2024 from https://www.ellenmacarthurfoundation.org/circular-economy-opportunity-and-benefit-factsheets
15. Climate ADAPT (2011). Guide to Climate Adaptation in Cities. Retrieved on 30.04.2024 from https://climate-adapt.eea.europa.eu/en/metadata/guidances/guide-to-climate-change-adaptation-in-cities/11237802
16. C40 Knowledge Hub (2019). How to adapt your city to extreme heat. Retrieved on 30.04.2024 from https://www.c40knowledgehub.org/s/article/How-to-adapt-your-city-to-extreme-heat?language=en_US

17. Urban Environment Agency (2020). Urban Adaptation in Europe: How cities and towns respond to climate change. Retrieved on 30.04.2024 from https://www.eea.europa.eu/publications/urban-adaptation-in-europe

Annex I: Project outcome indicators

Dimension 1: Mobility Planning

Dimension 2: Connected and smart mobility

Dimension 3: Safety

Dimension 4: Environment

Dimension 5: Social

Dimension 1: Mobility Planning

1.1 Expand interventions beyond the LL	
Outcome indicator, Outcome 2	
For cities to contribute to this KPI, there must be an intention to scale the intervention. This needs a successful test result of the intervention, showing a sufficient impact achieved short-term (and medium-term if possible). This impact needs to be clearly indicating on what long-term impact can be achieved by scaling the intervention. In terms of scale, this can either be city-wide, to expand the solution beyond the test area or start the implementation of the intervention on a wider scale. This can either be just more LLs testing this intervention in different areas, or full-scale implementation of the intervention for city-wide application. It can also mean starting LLs in other cities country wide.	
City relevant	
Unit	Number
How: Measure result	**Analysis of impact achieved during pilots.** Data must clearly indicate the intended results have been achieved. **Mitigation for unintended negative consequences.** Challenges identified through the test of the intervention must be thought-through and the city needs to clearly articulate how to address those challenges. If the intervention needs to be changed based on the challenges, the new and iterated solutions need to be clearly articulated. **Description of intentions for scaling.** It is required to present an action plan on how the intervention will be scaled including: Size increase in % of area covered by intervention, time frame, monitoring and evaluation plan. It might be that for the intervention's expansion, the city decides to only scale one element of the solution to begin with. It will be required to describe in the implementation plan, how this is intended to be scaled including other relevant elements of the solution. **Continue user engagement.** It will be expected that scaling an intervention to another context and place might pose new challenges. It will be important for cities to continue user engagement throughout, to adapt the solution based on local needs and infrastructure. It requires a user engagement strategy detailed in the implementation plan, detailing user groups, engagement methodologies and timeframes.
Frequency	Once, at the end
Collection methods	Review test results and measure impact
Target	One intervention per city
Project management relevant	
Project-wide targets	Original name: No. of participant cities to expand interventions beyond the LLs. **Minimum of 6 cities.**
Cities contributing	
Cities not decided yet	
Source	
Reference	

1.2 Addressing re-assessment of roads and public space quality scored over 75% in acceptance responding to needs of diverse groups

Outcome indicator, Outcome 4	
Reassessment means that within the project, the target area of this KPI, roads and public space, must be changed. This cannot be applied to an area that has not been part of the re-design. The quality resulting from that process needs to be assessed using the Safety and Accessibility rating system. It must be validated that the quality of road and public space has increased by measuring the satisfaction of diverse user groups.	
Unit	%
City relevant	
How: Measure result Sub-KPI User satisfaction	**Measuring quality.** Use safety and accessibility rating system to measure acceptance to ensure that there has been an increase of quality resulting from the intervention. This would rate around a 3 or 4 star for safety, environment and accessibility. **Measure user acceptance.** Use feedback from diverse groups to estimate % of satisfaction with the change of the area. It is required to analyse people's perception and experience around safety and accessibility before and after the intervention has been implemented. Compare before and after Calculate: The average reported satisfaction. Ask users: Generally speaking, please tell me if you are [1] satisfied, [2] rather satisfied, [3] rather unsatisfied, [4] not at all satisfied, or [5] DK/NA (do not read out), with each of the following issues in your city or area. $\overline{SAT} = \frac{\sum_m \overline{ASPECT_m}}{m}\ m\ being\ the\ number\ of\ aspects\ (dimensions)$ $\overline{ASPECT_m} = \sum_h \overline{AGREE_{h,m}}\ h\ being\ the\ four\ replies\ of\ the\ agreement\ scale:$ $(strongly\ agree, somewhat\ agree, somewhat\ disagree, strongly\ disagree)$ $\overline{AGREE_{h,m}} = \frac{\#times\ agreement\ h\ was\ used\ in\ sample\ for\ aspect\ m}{\#people\ sample\ of\ aspect\ m - \#\frac{DK}{NA} answers\ in\ sample\ m} x C_h$ $C_{h=strongly\ agree} = 10;\ C_{h=somewhat\ agree} = 6.66;\ C_{h=somewhat\ disagree} = 3.33$ $C_{h=strongly\ disagree} = 0$
Frequency	Before, during and after implementation
Collection methods	Interview, Workshop, Survey
Target	75%
Project management relevant	
Project-wide targets	Original name: At least 4 LL that addressing re-assessment of roads and public space quality scored over 75% in acceptance responding to needs of diverse groups

	Minimum of 4 cities
Cities contributing	
Cities not decided yet	
Source	Civitas SUMI "Quality of public space"

1.3 Addressing rebalance of public space to achieve desired modal split	
Outcome indicator, Outcome 6	
The project is aiming for a shift of modal split. This includes cycling, e-scooters, walking, public transport, or shared mobility. The intervention will redesign public space to achieve that. To give some examples, this can be a new distribution of space on the roads to allow safer space for cycling, more pedestrian crossings, less parking space to increase pedestrian pathways, more green areas and other infrastructure that will allow people with physical and cognitive mobility challenges to use the public space. Key here is, that it is very clear how your intervention has led to changes in the public space, that either motivate, enable, support or ensure people to use different modes of transport which is aimed by the city.	
Unit	%
City relevant	
How: Measure result	Choose one area in your LL where you will redistribute the public space as part of your intervention. Collect data before and after the implementation of the intervention. **Rebalance public space.** Calculate public space increase in %, compare before and after intervention. **Changes of modal split.** Collect data to calculate how the percentage of modes of transport are changing. This needs to reflect the intentions the city had in mind when re-allocating public space. It needs to be clear from the impact statement that this had been a solution to achieve a desired change in modal split. Modal split according to the number of trips made by each mode of transport. Calculate: total number of vehicle kilometers ran for each mode within an urban area compared to the total number of vehicle kilometers ran for all modes within an urban area.
Where: Scale	LL, if the area is spacious, select one area where you envision new balance of modal split
Frequency	Before and after implementation. The data set should span across a timeframe of about 2 weeks minimum. The setting should be comparable, e.g. ensure that both data collection timeframes are falling outside of holiday seasons and summer breaks.
Collection methods	Survey, parking counts, Counting sensors and traffic /speed management, Road data from controlled intersection & related devices
Project management relevant	
Project-wide targets	Original name: No. LL addressing rebalance of public space to achieve desired modal split (min. 7) **Minimum of 7 cities**
Cities contributing	
Cities not decided yet	

Sources	Civica SUMI “Modal Split”

1.4 Congestion and delays	
SUMI 8	
Delays in road traffic (private transport) and public transport for all modes of transport during peak hours. Compared to normal road traffic conditions. Extra time needed to drive or travel.	
Unit	% (percentage delay during peak hours)
City relevant	
How: Measure result	For road private transport: sum of weighted averages over one representative corridor for car trips as a ratio of peak period travel times to off-peak travel times. For (road) public transport: sum of weighted averages over one representative corridor for public transport trips as a ratio of peak period travel times to estimated optimal travel time. $CDi = MS_{road} * \frac{\left(\sum_{i=1}^{10}\left(\frac{CTi * PHTi}{FFTi}\right)\right)}{\sum_{i=1}^{10} CTi} + MS_{pt} * \frac{\left(\sum_{j=1}^{10}(PTj * RTIj)\right)}{\sum_{j=1}^{10} PTj}$ • CDij = Congestion and delay index (percentage delay during peak hours) [% of delay] • CTi = Number of car trips during peak hours on main road corridor i [#]; If this information is missing, the number of lanes could be used as an alternative weighing factor • PHTi = Car travel time during peak hours on main road corridor i [minutes] • FFTi = Off-peak car travel time on main road corridor i [minutes] • PTj = Number of public transport trips during peak hours on transit corridor j [#] • PTPHTj = Public transport travel time during peak hours on main road corridor i [minutes] • PTOTj = Optimal Public Transport travel time on main road corridor i [minutes] • MSroad = Modal share road [%] (modal share as the number of persons which are travelling, modal share when only considering private car and PT as possible modes) • MSpt= Modal share public transport [%] (modal share as the number of persons which are travelling, modal share when only considering private car and PT as possible modes)
Frequency	For improvement: Before and after implementation
Collection methods	Simulation Software and digital tools, Recording device from vehicle, Floating car data, Road data from controlled intersection and related devices Traffic model calculation Field Survey Analysis of travel time data collected by public transport providers Data obtained through online route planners based on real-time traffic conditions for the corridors to be studied Incidents that cause delays

Target	
Sources	
Reference	

1.5 Opportunity for active mobility	
SUMI 10	
Options and infrastructure for active mobility, which refers to the use of the modes walking and biking. The improvement of this indicator can clearly contribute to diminishing city transport greenhouse gasses emissions per unit travelled.	
Unit	% (share of road length adapted for active mobility, walking or cycling)
City relevant	
How: Measure result	The indicator for active mobility provides a score combining the share of the total road network adapted for walking and cycling. • The length of the road network adapted to walking is calculated from the length of pavements plus the length of pedestrian zones, as a share of the total road network. • The length of road network adapted to cycling is calculated from the length of road network with bike lanes plus the length of roads in a 30 km/h zone, as a share of the total road network. To avoid misrepresenting or underestimating the length of cycle networks, the length of cycle lanes shall be counted in terms of single width cycle lanes. If a cycle lane is on both sides of the street, or double width for two-way cycle traffic, this shall be counted double. $R_{am} = \frac{(L_{sw}+L_{bl}+L_{z30}+L_{pz})}{L_{rn}}$ Ram = Share of road length adapted for active mobility [n] Lpv = Length of road network with pavements (not if in a pedestrian zone) [km] Lbl = Length of road network with bike lanes (not if in a 30 km/h zone) [km] Lz30 = Length of road network in 30 km/h zone [km] Lpz = Length of pedestrian zone(s) [km] Lrn = Total length of city road network (excluding motorways) [km]
Frequency	To rate opportunity: After implementation
Collection methods	Interview, Workshop, Survey, Counting sensors and traffic/speed management, Public and private services databases Google Map/ OpenStreetMap
Target	
Sources	
Reference	

<table>
<tr><th colspan="2">1.6 Multimodal integration</th></tr>
<tr><td colspan="2">SUMI 11</td></tr>
<tr><td colspan="2">Quality of the interchange facilities between different transport modes. An interchange is any place where a traveler can switch from one mode of travel to another, with a minimum/ reasonable amount of walking or waiting. The more modes available at an interchange, the higher the level of multimodal integration.
A place, or structure, can be considered an interchange if switching from one mode of travel to the other(s) can be done in a relatively smooth way. Switching from one mode of transport to another within the interchange should only require a short walk (max. 500m).
The indicator is designed to capture the availability of multimodal interchanges and hubs, not the level of connectivity of the transport network. As such, you can include multimodal connections from metro to bus, or bus to tram (for example). However, interchanges between distinct lines of the same transport mode are not included in this indicator (such as metro-metro, tram-tram, or bus-bus).</td></tr>
<tr><td>Unit</td><td>Score (between 0 and 1 showing the average level of multimodal connection of the interchange points within an urban transport network)</td></tr>
<tr><td colspan="2">City relevant</td></tr>
<tr><td>How: Measure result</td><td>Specify if the specific mode of transport is available in the experimentation area (Yes or No) from the list below:
Long-distance bus
Railway (all types of services)
Metro
LRT/tram
Local bus
Bicycle (bike sharing station)
Car sharing (station or reserved parking place)
Bicycle parking (specially designated and protected facility)
Park&Ride
Reserved taxi rank
Ferry
List all the interchanges (provide the name of it)
For each interchange, select whether the specific mode of transport is available or not (Yes or No). This process should be repeated for all the identified interchanges.
Count the number of modes for each interchange
Calculate the ratio between the number of modes for each interchange and the total number of modes of transport available in the experimentation area</td></tr>
<tr><td>Frequency</td><td>To rate multimodal integration: After implementation
To measure improvement: before and after implementation</td></tr>
<tr><td>Collection methods</td><td>Interview, Workshop, Survey, Counting sensors and traffic/speed management, Public and private services databases, Public transport operational data

The data will be collected by analyzing the network characteristics of the public transport operators, as well as information from the local urban area administration regarding the facilities available at interchanges in the urban area.</td></tr>
<tr><td>Target</td><td></td></tr>
<tr><td>Sources</td><td></td></tr>
</table>

Reference	

1.7 Quality of public spaces	
SUMI 14	
Quality of public area, presence in the city of streets and squares that offer sociability and a good image.	
Unit	% (of satisfaction)
City relevant	

How: Measure result	The indicator can be measured by conducting a survey based on the following question & answers:
	• “Generally speaking, please tell me if you are satisfied, rather satisfied, rather unsatisfied, not at all satisfied, or don’t know/not Applicable, with each of the following issues in your city or area:
	  ○ Public spaces such as markets, squares, pedestrian areas
	  ○ Green spaces such as parks and gardens”.
	
	• Indicate the number of respondents for each answer (satisfied, rather satisfied, rather unsatisfied, not at all satisfied, or don’t)
	• Calculate the weighted average to obtain the perceived satisfaction of public spaces
	
	$\overline{SAT} = \frac{\sum_m \overline{ASPECT_m}}{m}$ *m being the number of aspects (dimensions)*
	
	$\overline{ASPECT_m} = \sum_h \overline{AGREE_{h,m}}$ *h being the four replies of the agreement scale:*
	
	(strongly agree, somewhat agree, somewhat disagree, strongly disagree)
	
	$\overline{AGREE_{h,m}} = \frac{\#times\ agreement\ h\ was\ used\ in\ sample\ for\ aspect\ m}{\#people\ sample\ of\ aspect\ m - \#\frac{DK}{NA}\ answers\ in\ sample\ m} x C_h$
	
	$C_{h=strongly\ agree} = 10;\ C_{h=somewhat\ agree} = 6.66;\ C_{h=somewhat\ disagree} = 3.33$
	$C_{h=strongly\ disagree} = 0$

Frequency	Once, to rate the perceived satisfaction. To measure improvement: before and after implementation
Collection methods	Interview, Workshop, Survey Population survey • This indicator was designed to analyze results from the European Commission's Urban Audit, a perception survey on quality of life in European cities conducted by Eurostat based on telephone interviews

	regularly. Check whether your city has been part of the EC's Urban Audit in 2019 or 2015. • If your city has not been part of the Urban Audit, you can collect the necessary data for this indicator by conducting a small survey
Target	
Sources	
Reference	D2.1 Inclusion Plan, D2.3 Participatory tools playbook

1.8 Urban functional diversity	
SUMI 15	
Functional diversity refers to a mix of spatial functions in an area related to daily activities (except from work) such as: • Business (industry, offices, logistics, etc.) • Energy resources (e.g. petrol and gas stations) • Hospital and medical services • General services (post, administration, etc.) • Schools • Commercial (shops, supermarkets) • Sports and recreation • Residential (families) • Residence for elderly people • Parks and greens • Other spatial functional categories depending on each city's specificities	
Unit	Score (number)
City relevant	
How: Measure result	The functional diversity score corresponds to the sum of the functional activities weighted by the population living in the area. • Depending on the scale of the experiment, divide the urban area into a suitable spatial unit of analysis. It could be grids of 1 kms x 1 kms for city large experiment or neighborhoods for smaller scale experiment... • Make sure to cover a large and representative amount of your population and spatial structures. • For each spatial unit (grids of 1kms, neighborhoods, etc.), the presence (value 1) or not (value 0) of out of 10 spatial functions must be put in. • For each zone, a fraction of the population living there must be inserted. $$FDS = \sum_{ij} Pop_i(\forall Pres_{ij} > 0)$$ • FDS = Functional diversity score [%] • Popi = Fraction of population in the urban area in zone i [fraction] • Presij = Presence of functions j in zone i (it is equal to 1 if there is a presence; it is equal to 0 if there is not a presence) [binary]
Frequency	Once, to rate the urban functional diversity
Collection methods	Survey, Public and private service databases, Public transport operational data

	GIS/ Google Map/ OpenStreetMap
Target	
Sources	
Reference	

Dimension 2: Connected and smart mobility

2.1 Reduction of private car use	
Outcome indicator, Outcome 1	
There needs to be evidence that the intervention in the LL has contributed to reduced car use.	
Unit	%
City relevant	
How: Measure result	Reduced car use: Measuring the traffic in a selected representative area in the LL. A representative area will be the one with the heaviest traffic flow. It should be an area where the solution is being implemented so you can test the results before and after. It must be clearly identified that those cars are private cars.
Frequency	Before and after implementation
Collection methods	Survey, Parking counts, Counting sensors and traffic/speed management, Public and private service database, Public transport operational data
Target	Min of 10% reduction
Project management relevant	
Project-wide targets	In all Living Labs: Min. 10% reduction of the use of private cars **All LLs**
Cities contributing	
Cities not decided yet	
Sources	

2.2 Deployment of Zero Emission and shared mobility services	
Outcome indicator, Outcome 1	
Asked is for the number of services implemented through the Elaborator project. This will be considered and summarized by the project management. Definition of shared mobility services: Services based on renting means of transport short- or long-term. This can be cycling, car use, e-scooter use or platforms that support sharing trips or items such as car sharing platforms. Definition of zero emission services: These services will replace some trips of private use cars, reducing the amount of emission in the targeted areas.	
Unit	Numbers
City relevant	
How: Measure result	Shared services: Count the number of services implemented in the LL that will be shared.

	Zero Emission services: Calculate how many users are expected to use these services and the expectations on how that will reduce car use and air pollutants. It would be useful to prove the expected impact by providing data before implementation that indicates the current level of air pollution caused by private car use.
Frequency	After implementation
Collection methods	Survey, Simulation Software and digital tools, Floating car data, Counting sensors and traffic/speed management, CO2 Sensors and air quality sensors, public transport operational data
Target	Min 1 service
Project management relevant	
Project-wide targets	Original name: No. of new zero emission shared mobility services
Cities contributing	
Cities not decided yet	
Sources	

2.3 75% user acceptance for zero emission services	
Outcome indicator, Outcome 4	
Micro mobility shared services and apps that were deployed and tested together with infrastructural changes score mora than 75% user acceptance. That will be measured in safety, usability, efficiency, flexibility, accuracy etc. from diverse groups.	
Unit	%
City relevant	
How: Measure result	**Measure the satisfaction of users:** User/provider/stakeholder average reported satisfaction with • the overall quality of the transport system (public transport, cycling, walking, etc.) • the quality of a specific service It measures the experience of the user/provider, against its expectations. Unit: % of shares with a qualitative score (1-5) of the perception of quality **Measuring quality.** Use safety and accessibility rating system to measure acceptance to ensure that there has been an increase of quality resulting from the intervention. This would rate around a 3 or 4 star for safety, environment and accessibility. **Measure user acceptance.** Use feedback from diverse groups to estimate % of satisfaction with the change of the area. It is required to analyze people’s perception and experience around safety and accessibility before and after the intervention has been implemented. Compare before and after Calculate: The average reported satisfaction on the specific dimensions outlined above. Ask users for each topic: Generally speaking, please tell me if you are [1] satisfied, [2] rather satisfied, [3] rather unsatisfied, [4] not at all satisfied, or [5] DK/NA (do not read out), with each of the following issues in your city or area.

	$\overline{SAT} = \frac{\sum_m \overline{ASPECT}_m}{m}$ $m\ being\ the\ number\ of\ aspects\ (dimensions)$ $\overline{ASPECT}_m = \sum_h \overline{AGREE}_{h,m}$ $h\ being\ the\ four\ replies\ of\ the\ agreement\ scale:$ $(strongly\ agree, somewhat\ agree, somewhat\ disagree, strongly\ disagree)$ $\overline{AGREE}_{h,m} = \frac{\#times\ agreement\ h\ was\ used\ in\ sample\ for\ aspect\ m}{\#people\ sample\ of\ aspect\ m - \#\frac{DK}{NA} answers\ in\ sample\ m} xC_h$ $C_{h=strongly\ agree} = 10;\ C_{h=somewhat\ agree} = 6.66;\ C_{h=somewhat\ disagree} = 3.33$ $C_{h=strongly\ disagree} = 0$ Engage with diverse groups: Refer to the guidance and success factors in the inclusion plan.
Where: Scale	LL
Frequency	After implementation
Collection methods	Interview, Workshop, Survey, Counting sensors and traffic/speed management Participatory methods
Project management relevant	
Project-wide target	Original name: Micro-mobility shared services and apps deployed, showcased and tested in the relevant LLs together with relevant infrastructural changes score above 75% in user acceptance as regards safety, usability, efficiency, flexibility, accuracy, etc. from diverse groups.
Cities contributing	
Cities not decided yet	
Sources	Civitas SUMI “User acceptance”
Reference	D2.1 Inclusion Plan, D2.3 Co-design handbook

2.4 5% increase of desired modal split	
Outcome indicator, Outcome 6	
It should be aimed at increasing the use of active mobility modes of transport.	
Unit	%
City relevant	
How: Measure result	Active mobility modes: Cycling, walking, skating, e-scooters. To calculate the increase, data from before and after the implementation of the intervention has to be collected and analyzed.

	Changes of modal split. Collect data about use or expected use (by measuring user acceptance) of active mobility modes. Calculate how the percentage of modes of transport are changing. Modal split can be also measured according to the number of trips run by modes of transport. Calculate: total number of transport mode kilometers ran for each mode within an urban area compared to the total number of transport kilometers ran for all modes within an urban area.
Where: Scale	LL
Frequency	Before and after implementation
Collection methods	Survey, Parking counts, Counting sensors and traffic/speed management, Road data from controlled intersection & related devices
Target	Min 1 service
Project management relevant	
Project-wide target	Min 5% increase of modal shift toward desired active mode of transport in LL areas **All LLs**
Cities contributing	
Cities not decided yet	
Sources	Civitas SUMI "Modal Split"

2.5 Access to mobility services	
SUMI 6	
This indicator will be monitored by the proportion of the population that has convenient access to public transport. Because most public transport users walk from their trip origins to public transport stops and from public transport stops to their trip destination, local spatial availability and accessibility is sometimes evaluated in terms of pedestrian (walk) access, as opposed to park and ride or transfers. Hence, access to public transport is considered convenient when a public transport stop is accessible within a short walking distance along the street network from a reference point (such as a home, school, workplace...). Additional criteria for defining public transport that is convenient could also include: Public transport is accessible to all special-needs customers, including those who are physically, visually, and/or hearing-impaired, and those with temporary disabilities, the elderly, children and other people in vulnerable situations. b. public transport with frequent service during peak travel times c. Stops present a safe and comfortable station environment	
Unit	%
City relevant	
How: Measure result	• The share of the population with appropriate access to mobility services (public transport: bus, tram, metro, train). ○ This is the percentage of people living within a birds'-eye distance of 400 meters from a public transport stop or 800 meters from a rail transport stop.

	○ Distances of 400 meters for shared bike stations and 800 meters for shared car systems are also to be considered as acceptable for mobility services ○ The real distance measured along the street network can be used too (this is of course more realistic). The values to define the service area based on real distances to be used are 500 meters for bus stops and 1,000 meters for rail stations. • Detailed formula: $AccI = \frac{\sum_i PR_i * W_i}{cap}$ AccI = Appropriate access index [% of population] PRi = Number of people living within the access typology zone i, identified by combination of Public Transport accessibility level. The sum of population PRi has to be equal to the total population of the urban area. Wi = Weight to identify if the accessibility to mobility services is appropriate (depending on the combination of Public Transport accessibility level). The weight is differentiated for small (i.e. less than 100,000 inhabitants) or large urban areas. The weight Wi is predefined (not modified by the user) and identifies if the accessibility is appropriate as follows: • it is = 1 where it is fully appropriate • it is = 0.5 where it isn't fully appropriate • it is = 0 where it isn't appropriate Cap = Capita or number of inhabitants in the urban area The indicator value corresponding to this parameter value is on a scale from 0 to 10, with 0 indicating the lowest level of access to mobility services (0% of population with appropriate access to public transport) and 10 indicating the highest level (100% of population with appropriate access to public transport). The level of accessibility considers the distance from stops/ stations and departures of the public transport service. All stops located within a 50m distance from another stop should be considered as one single stop (e.g. if a bus stop is located at both sides of a street, one for each direction, the related stop should be considered as one - and the related departures should sum the departures in both directions).
Where: Scale	Intervention area / Neighborhood scale
Frequency	To rate accessibility: After implementation For improvement: Before and after implementation
Collection methods	Interview, Workshop, Survey, Traffic counts, Counting sensors and traffic/speed management, 11 Public and Private services databases Recommended methods: TBD • Household surveys • Data from public transport operators, government agencies, mobility App • Distance from residential/job areas to stops/stations (Google Map)

Target	
Sources	SUMI 6
Reference	D2.1 Inclusion Plan, D2.3 Participators tools playbook

2.6 Commuting travel time	
SUMI 16	
This indicator presents information on the average daily time (in minutes) men and women spend commuting from home to work or place of study. Commuting refers to basic activities and travel that are essential for social and economic development. This indicator focuses on commuting travel time to work or educational places because they are the most important trips for people and often the most inflexible ones	
Unit	minutes/day
City relevant	
How: Measure result	Average time spent commuting to and from work or an educational establishment, using any types of modes (car, motorcycle, public transport, ferry, bike, walking, car & public transport, walk & public transport). $\overline{Tcom} = \sum_i \frac{Tout_i}{n} + \sum_i \frac{Treturn_i}{n}$ • Tcom: Average commuting travel time [minutes/day] • Touti: Commuting time to work/school by person i [minutes/day] • Treturni: Commuting time to home by person i [minutes/day] • n: number of persons in survey
Where: Scale	The number of participants in the survey is set at 100 people. However, for larger urban areas this sample size might be too small and a minimum sample size of 500 is recommended.
Frequency	To rate commuting travel time: After implementation For improvement: Before and after implementation
Collection methods	Interview, Survey, Road data from device, Simulation Software and digital tools Mobility surveys provide information on the average daily time travelling to and from work during a weekday. Questions refer to modal choice and travel time: The average time to commute (travel to work or to an educational establishment, average between outward journey and return journey) is expressed in minutes per day.
Target	
Sources	
Reference	

2.7 Modal split
SUMI 19
Modal split measures the importance of each mode of transport in the total freight or passenger transport, and the evolution over time in the share of each transport mode. This indicator is defined as the percentage of each

mode of transport in total transport performance measured in tonne/kilometers for freight or passenger-kilometers for passenger transport. Transport performance (in tonne-kilometers or passenger-kilometers) follows the 'territoriality principle' which means that only freight and passenger transport performed within the territory of a country is considered	
Unit	Tonne-kilometer (tkm) for freight transport. Passenger-kilometer (pkm) for passenger transport performance.
City relevant	
How: Measure result	This indicator is defined as the percentage of each mode of transport in the total transport performance measured in tonne-kilometers (tkm) for freight or passenger-kilometers (pkm) for passenger transport. **For passenger mobility**: • Modal split according to passenger kilometers ran (million-person km): total number of passenger kilometers ran for each mode within an urban area compared to the total number of passenger kilometers ran for all modes within an urban area. • Modal split according to vehicle kilometers ran (million vehicle km): total number of vehicle kilometers ran for each mode within an urban area compared to the total number of vehicle kilometers ran for all modes within an urban area • Modal split according to the number of trips ran (number of trips ran): total number of trips for each mode within an urban area compared to the total number of trips for all modes within an urban area **For freight**: • Modal split according to goods vehicles kilometers ran (million vehicle km): total number of goods vehicles kilometers ran for each goods vehicles mode within an urban region compared to the total number of goods vehicles kilometers ran for all goods vehicles modes within an urban area. • Modal split according to freight tonnes kilometers ran (million tonnes km): total number of goods tonnes kilometers ran for each goods transport mode within an urban area compared to the total number of vehicle tonnes kilometers ran for all goods transport modes within an urban area. An increasing share of one mode does not necessarily mean a higher transport performance for that mode. Instead, this may be a result of noticeable drops in other modes.
Where: Scale	Intervention area / Neighborhood scale
Frequency	To rate commuting travel time: After implementation For improvement: Before and after implementation
Collection methods	Survey, Parking counts, Counting sensors and traffic/speed management, Road data from controlled intersection & related devices Mobility Survey Data from public transport operators People might be accounted for twice. Once for the traditional modal split and once for shared mobility. Drivers of shared bikes should be considered as cyclists in the modal split.
Target	

Sources	
Reference	

2.8 Urban functional diversity	
SUMI 15	
Functional diversity refers to a mix of spatial functions in an area, creating proximity of activities. Average presence or not out of 10 spatial functions related to daily activities except for work • Business (industry, offices, logistics, etc.) • Hospital and medical services • General services (post, administration, etc.) • Schools • Commercial (shops, supermarkets) • Sports and recreation • Residential (families) • Residence for elderly people • Parks and greens	
Unit	% (functional diversity score)
City relevant	
How: Measure result	The first step in the methodology is the division of the city area into squares of 1 km x 1 km by using existing data and GIS. The next step is to identify what functions are present in each grid, and what functions are not. Functions are defined by 10 land-use categories (see the list in the upper section). Accordingly, maps can be created also by using GIS. The score of presence of the 10 functions is weighted with the population fraction (related to the city population) in the grid concerned. FDS = $\sum_{ij} Pop_i(\forall Pres_{ij} > 0)$ • FDS = Functional diversity score [%] • Popi = Fraction of population in the urban area in zone i [fraction] • Presij = Presence of functions j in zone i (it is equal to 1 if there is a presence; it is equal to 0 if there is not a presence) [binary] The indicator is complementary to the commuting travel time indicator. This indicator also measures the proximity from the home of other functions than workplaces, such as schools, services, shops.
Where: Scale	Intervention area / Neighborhood scale
Frequency	To rate commuting travel time: After implementation For improvement: Before and after implementation

Collection methods	Survey, Public and private service databases, Public transport operational data GIS
Target	
Sources	SUMI 15
Reference	

Dimension 3: Safety

3.1. Solutions in unsafe locations score above 75% user satisfaction	
Outcome indicator, Outcome 3	
Over 6 months, solutions must be tested in areas regarded unsafe. A 75% of user satisfaction must be measured to contribute to this KPI. There is a special focus on safety perception of VRUs.	
City relevant	
Unit	%
How: Measure result	**Measure the satisfaction of users:** User/provider/stakeholder average reported satisfaction with • the overall quality of the transport system (public transport, cycling, walking, etc.) • the quality of a specific service It measures the experience of the user/provider, against its expectations. Unit: % of shares with a qualitative score (1-5) of the perception of quality **Measuring quality.** Use safety and accessibility rating system to measure acceptance to ensure that there has been an increase of quality resulting from the intervention. This would rate around a 3 or 4 star for safety, environment and accessibility. **Measure user acceptance.** Use feedback from diverse groups to estimate % of satisfaction with the change of the area. It is required to analyze people's perception and experience around safety and accessibility before and after the intervention has been implemented. Compare before and after Calculate: The average reported satisfaction on the specific dimensions outlined above. Ask users for each topic: Generally speaking, please tell me if you are [1] satisfied, [2] rather satisfied, [3] rather unsatisfied, [4] not at all satisfied, or [5] DK/NA (do not read out), with each of the following issues in your city or area.

	$\overline{SAT} = \frac{\sum_m \overline{ASPECT}_m}{m}\ m\ \text{being the number of aspects (dimensions)}$ $\overline{ASPECT}_m = \sum_h \overline{AGREE}_{h,m}\ h\ \text{being the four replies of the agreement scale:}$ $(\text{strongly agree, somewhat agree, somewhat disagree, strongly disagree})$ $\overline{AGREE}_{h,m} = \frac{\#\text{times agreement } h \text{ was used in sample for aspect } m}{\#\text{people sample of aspect } m - \#\frac{DK}{NA}\text{answers in sample } m} x C_h$ $C_{h=strongly\ agree} = 10;\ C_{h=somewhat\ agree} = 6.66;\ C_{h=somewhat\ disagree} = 3.33$ $C_{h=strongly\ disagree} = 0$
Where: Scale	LL
Frequency	After implementation
Collection methods	2 Interview, 4 Survey
Target	75% of user satisfaction
Project management relevant	
Project-wide target	Original name: Showcase for 6 months solutions for at least 14 unsafe locations (10 in urban setting and 4 in peri-urban settings) that score above 75% in user acceptance with special focus on safety perception of VRUs **Min 14 locations (10 urban, 4 peri-urban)**
Cities contributing	
Cities not decided yet	
Source	Civitas SUMI "User acceptance"
Reference	D2.1 Inclusion Plan, for definition and engagement with groups of VRUs D2.3 Co-Design Playbook, for engagement with VRUs

3.2 Addressing safety risk for cycling and e-scooters	
Outcome indicator, Outcome 5	
Increasing the use of cycling and e-scooters in the city comes with an increased risk for accidents.	
Unit	Number
City relevant	
How: Measure result	The target is to directly address the risk. For cities contributing to this KPI, there needs to be a plan in how to mitigate the risk and avoid accidents involving cyclists or users of e-scooters. What is needed is an intention to implement those measures alongside the intervention. Qualitative data can be collected

Frequency	The number of cities targeting this KPI can be collected only once. But when it comes to the actual safety impacts of implemented interventions, a before and after measures are needed to verify the safety improvement.
Collection methods	Interview, Survey, Simulation software, digital tools, Recording device in the vehicle, Public and private service data base, Road data from controlled intersections & related devices Accident statistics (not very relevant in the intervention level), perceived safety (surveys), in-direct measures, such as conflicts, speed etc. (see more details below)
Target	
Project management relevant	
Project-wide target	Original name: No. of LLs directly addressing safety risk by expected increase in cycling and e-scooters **Min 5 LL**
Cities contributing	
Cities not decided yet	
Sources	
Reference	

3.3 Decrease of safety risks	
Outcome indicator, Outcome 5	
Cities need to show how their interventions are expected to actively contribute to reducing safety risks. This is more a general indicator, it could be looking at safety for pedestrians, cyclists or VRUs, it's up to the city to define their safety impact.	
Unit	%
City relevant	
How: Measure result	In this KPI, it is important to show how interventions are expected to contribute to a decrease of safety risks. This can be measured using quantitative data such as the number of accidents, number of conflicts etc. or qualitative data, e.g. by asking for people's perception of safety. Safety risks affected by changes in infrastructure or mobility services can also be estimated using simulation tools. To quantify some of the qualitative data, you need to use the safety rating system for "Safety". The rating system also explains how to compare the measurements at different times – before and after the intervention. There are many indicators in the sections "SUMIs" and "Other indicators" that explain how to measure safety with different types of data. Long-term, cities should continue to collect data on the risk of safety.
Frequency	Before and after the implementation – to ensure that the intervention is improving safety.
Collection methods	Interview, Survey, Simulation software, digital tools, Recording device in the vehicle, Public and private service data base, Road data from controlled intersections & related devices

Target	At least one area in your LL has proven a decrease of risk due to the intervention
Project management relevant	
Project-wide target	Original name: No. of LLs to decrease expected safety risk **All LLs**
Cities contributing	
Cities not decided yet	
Sources	
Reference	SUMIS and Other indicators: Evaluation Area “Safety”

3.4 Deploy cutting-edge safety evaluation and prediction tools	
Outcome indicator, Outcome 5	
A minimum of 5 observer cities should deploy those tools. That would be one of the more tech-led evaluation data collection methodologies. This can be at any point in the project.	
Unit	Number
City relevant	
How: Measure result	Using one of the methodologies from the Evaluation Plan that are labeled as technologically advanced can be considered cutting-edge. Also, the toolkits for active citizens classify as such.
Frequency	Application minimum once, at any point throughout the project
Collection methods	
Target	At least one tool has been used at least once
Project management relevant	
Project-wide targets	Original name: At least 5 observer cities are willing to deploy the project’s cutting-edge safety evaluation and prediction tools **Min 5 LLs**
Cities contributing	
Cities not decided yet	
Sources	
Reference	T2.4 Toolkit for active citizens

3.5 3-star rating for pedestrians and micro mobility users	
Outcome indicator, Outcome 6	
As a measurement, the % increase of mobility services that are rated with 3 stars or more needs to be provided. This regards all services for pedestrians, shared or micro mobility.	
Unit	%
City relevant	
How: Measure result	Using the safety and accessibility start rating system.
Frequency	Before and after implementation to verify the safety impacts
Collection methods	Safety rating system
Target	

Project management relevant	
Project-wide target	Original name: No of LL to increase % of travel to 3-star or better for pedestrians and cyclists/micro-mobility users **All LLs**
Cities contributing	
Cities not decided yet	
Sources	

3.6 Road deaths	
SUMI 5	
Road deaths are probably the most used indicator for traffic safety for various road user groups in various levels (national, regional, city). The trends are often used to show how overall safety in selected areas is evolving.	
Unit	Number per year in a selected area
City relevant	
How: Measure result	Road deaths are collected in official national databases – and could be considered as an ultimate traffic safety indicator. Fatalities at the city level are, however, fortunately quite rare – and hence this KPI may be difficult to be used to verify the safety impacts due to project level interventions and during the project duration. Hence, other indicators such as less severe incidents (conflicts) and proxy measures, such as speed or sudden changes in acceleration (jerks) or even subjective measures such as perceived safety are more useful in the project level impact assessment. Number of deaths within 30 days after the traffic accident as a corollary of the event per annum caused by urban transport per 100,000 inhabitants of the urban area. FR = $\frac{\sum_i K_i * 100000}{Cap}$ FR = Fatality rate [# per 100,000 urban area population per year] Ki = Number of persons killed in transport mode i [# per year] Cap = Capita or number of inhabitants in the urban area [#] i = Transport mode
Where: Scale	LL
Frequency	For evaluating the impacts of the project interventions, this should be collected before and after the intervention was implemented
Collection methods	Floating car data, Counting sensors & traffic/speed management, Road data from controlled intersections & related devices Road deaths are registered: - per year - per traffic mode they were using at time of the accident OR independent of the traffic mode they were using - on public domain (i.e. roads, parking lots, or similar infrastructure which is

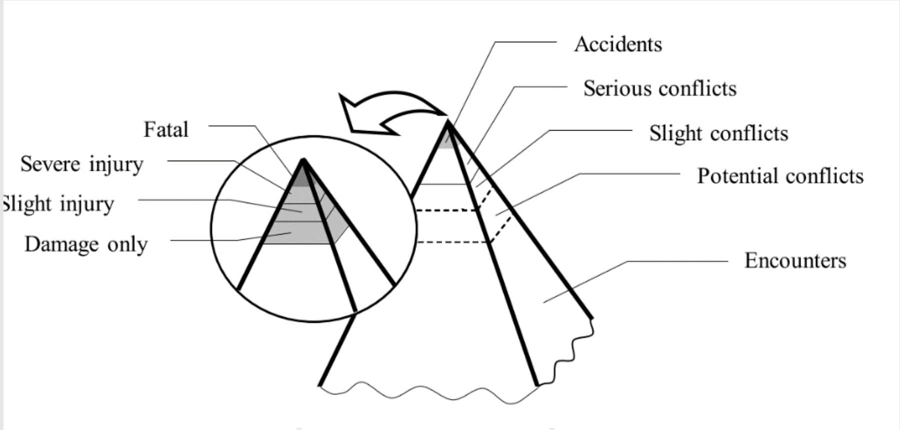
	publicly accessible) - as 'road deaths 30 days': road deaths are registered as such if they occur within 30 days of the accident Fatality rate (FR) is calculated per 100,000 inhabitants of the urban area In relation to soft modes (pedestrians and cyclists), it may be required to use additional data sources on leisure or sport activities to obtain a complete overview of road deaths for these travel modes.
Target	
Sources	SUMI 5
Reference	

3.7 Traffic safety active modes	
SUMI 13	
Fatalities (or injuries) of active mode users in traffic accidents in the city in relation to their exposure to traffic	
Unit	
City relevant	
How: Measure result	Number of deaths within 30 days after the traffic accident as a corollary of the event per annum caused by active modes of transport, per billion trips per annum (exposure) RF = Risk factor RFi = Risk factor for transport mode i [# per billion trips per year] Ki = Number of persons killed within 30 days after the traffic accident as a corollary of the event in transport mode i [# simple average over the last 3 years for which data is available] Expi = Exposure, defined as number of trips (in million) [# per year] i = Transport mode (pedestrian, bicycle) [type]
Where: Scale	LL
Frequency	
Collection methods	Interview, Survey, Simulation software and digital tools, Floating car data, Counting sensors & traffic/speed management, Road data from controlled intersections & related devices Fatalities are registered: - as the simple average over the last 3 years for which data is available - per traffic mode they were using at time of the accident - for this indicator walking and cycling Exposure is measured in millions of trips of the corresponding traffic mode (data collected via "modal split" spreadsheet) The risk factor is calculated from these values as fatalities per billion trips for a certain traffic mode. The indicator value is calculated as a function of the weighted risk factor for both active modes together, with 0 indicating the lowest level of traffic safety for active modes (risk factor of 2,000 fatalities per billion trips or higher) and 10 indicating the highest level (zero fatalities of active mode users). The maximum risk factor of

	2,000 fatalities per billion trips has been chosen based on real life data as the one that would include all observed cases.
Target	
Sources	SUMI 13
Reference	

3.8 Accessibility of public transport for mobility impaired groups	
SUMI 2	
This indicator determines the accessibility of public transport services to persons with reduced mobility. Such vulnerability groups include those with visual and audial impairments and those with physical restrictions, such as pregnant women, users of wheelchairs and mobility devices, the elderly, parents and caregivers using buggies, and people with temporary injuries.	
Unit	
City relevant	
How: Measure result	The proportion of total public transport services where accessibility has been facilitated for individuals who would otherwise be unable to use them. These guidelines outline how the indicator "accessibility for persons with reduced mobility" (PRM) is calculated and how the tables on the following sheet should be filled in. To capture the real-life accessibility for a person with reduced mobility, this indicator combines the accessibility levels of three elements: 1) accessibility of moving assets (vehicles) 2) accessibility of stops and stations 3) accessibility of ticket machines and offices The level of accessibility is calculated as described above separately for each mode of public transport (train, bus, tram, metro, ferries etc.). These values are combined into one overall accessibility score (percentage) through a weighting factor to represent the number of passengers that use each mode. This is to capture a situation where relatively few vehicles with relatively few stops transport a very high volume of passengers (e.g. a suburban commuter train). This score ranges from 0% to 100% and is converted proportionally into the indicator value between 0 and 10 simply by a division of 10. **Minimum:** The worst possible situation (leading to an indicator value of 0) is one where no ticket machine, no vehicle and no station/ stop can be considered accessible. **Maximum:** The best possible situation (leading to an indicator value of 10) is one where all ticket machines, all vehicles and all stations/ stops can be considered accessible. Such a situation would reach the goal of 100% accessibility as defined in recent EU legislation.
Where: Scale	Only the intervention area.

	For stops, stations, ticket offices and machines it would be important to measure all of them that will be available and calculate the specific accessibility for individual stops/stations additional to an overall score.
Frequency	After the implementation of the intervention
Collection methods	Interviews, Surveys
Target	
Sources	SUMI 2
Reference	D2.1 Inclusion Plan

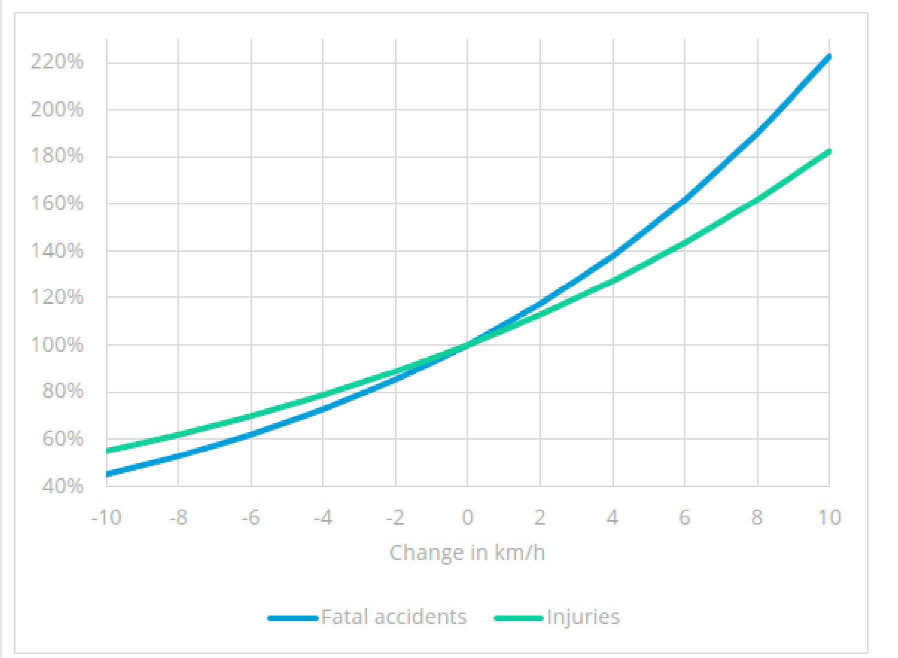
3.9 Conflicts	
Other	
Conflicts are highly correlated to the traffic accidents and can hence be used as an indicator for traffic safety, especially when comparing the safety situation before the traffic safety measure (or in project level: intervention) was put in place and after it is in use. A traffic conflict is an observable situation in which two or more road users approach each other in space and time to such an extent that there is a risk of collision if their movements remain unchanged (Amundsen and Hyde, 1977)	
Unit	
City relevant	
How: Measure result	The basic concept that the traffic conflicts theory is based on is that the traffic process can be seen as several elementary events. These events differ in their degree of severity (unsafety) and there exists some relation between the severity and frequency of events of that severity. Hydén (1987) illustrated the concept with a ‘safety pyramid’ (see Figure 1). The lower part of the pyramid represents the normal interactions (encounters) between road users that are safe and occur most of the time. At the other extreme, the top of the pyramid consists of the most severe events such as fatal or injury accidents and that are very infrequent compared to the total number of the events. If the form of the relation between the severity and frequency of the events is known, it is theoretically possible to calculate the frequency of the very severe but infrequent events (accidents) based on known frequency of the less severe, but more easily observable events (conflicts). 

	Source of this information and more guidance for the Swedish conflict technique: Laureshyn and Varhelyi (2020)[12]. The Swedish Traffic Conflict Technique, Observer's manual.
Where: Scale	In the intervention (e.g. intersection, pedestrian crossing etc.) level.
Frequency	Before and after the intervention was taken into use.
Collection methods	Floating car data, Counting sensors & traffic/speed management, Road data from controlled intersections & related devices E.g. high-resolution camera + software to select the frames in which the potential conflict takes place. Needs also human interpretation. It is also possible to manually observe the conflicts.
Target	
Sources	
Reference	Laureshyn and Varhelyi (2020). The Swedish Traffic Conflict Technique, Observer's manual (available online: LIB_Laureshyn_Varhelyi_2020.pdf (ictct.net)

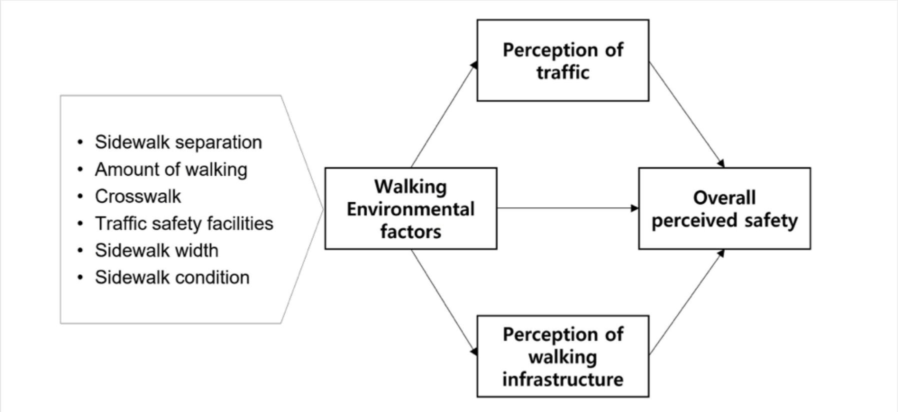
3.10 Speed	
Other	
Speed (km/h) of various road users in the selected area. Especially the speed of approaching vehicles.	
Unit	Km/h, mean, median, standard deviation, 85% speed
City relevant	
How: Measure result	Driving at excessive or inappropriate speed is a major threat to safety on the road. It is estimated that 10 to 15% of all crashes and 30% of all fatal crashes are the direct result of speeding or inappropriate speed[13] . The faster someone is driving, the higher the risk of a crash, but also the higher the severity of the crash and the probability that the crash is fatal. Another important factor influencing the crash risk is differences in vehicle speed. The less the speeds of vehicles differ from each other, the lower the risk of a crash.

[12] Laureshyn and Varhelyi (2020). The Swedish Traffic Conflict Technique, Observer's manual (available online: LIB_Laureshyn_Varhelyi_2020.pdf (ictct.net)

[13] road_safety_thematic_report_speeding.pdf (europa.eu), European Commission (2021) Road safety thematic report – Speeding. European Road Safety Observatory. Brussels, European Commission, Directorate General for Transport.

	
Where: Scale	In the intervention level
Frequency	Before and after the intervention took place.
Collection methods	Floating car data, Counting sensors & traffic/speed management, Road data from controlled intersections & related devices Radars, induction loops
Target	
Sources	road_safety_thematic_report_speeding.pdf (europa.eu)
Reference	European Commission (2021) Road safety thematic report – Speeding. European Road Safety Observatory. Brussels, European Commission, Directorate General for Transport.

3.11 Perceived safety	
Other	
Road users' perception of the safety (of selected mode)	
Unit	Subjective scale (likert or other ordinal scales can be used)
City relevant	
How: Measure result	Road users' perception of the safety in selected area can be collected with various subjective measures such as questionnaires, interviews or even in the face-2-face situations such as focus groups. Subjective perception of safety can affect users' willingness to use a certain mode or certain route – no matter if the location is safe or dangerous when measured objectively.

	By getting this information from the users, the city can select where the improvements should take place (to increase safety and users' willingness to use active modes in the area). In addition, a similar scale should be used before and after the traffic safety intervention has been taken into use – to be able to verify if the perceived safety in the intervention area has been improved. [14] 
Where: Scale	In the intervention level (for evaluation purposes) but can be done in much larger area (e.g. city level) to find out what are the locations perceived as most dangerous.
Frequency	For evaluation: before and after the intervention is used.
Collection methods	Interview, Workshop, Survey, Public and private service data bases Various subjective measures such as interviews, questionnaires (e.g. map-based surveys), group interviews (e.g. focus groups)
Target	
Sources	
Reference	e.g. Kim Y, Choi B, Choi M, Ahn S and Hwang S (2024) Enhancing pedestrian perceived safety through walking environment modification considering traffic and walking infrastructure. Front. Public Health 11:1326468. doi: 10.3389/fpubh.2023.1326468 Available online: Frontiers | Enhancing pedestrian perceived safety through walking environment modification considering traffic and walking infrastructure (frontiersin.org)

[14] e.g. Kim Y, Choi B, Choi M, Ahn S and Hwang S (2024) Enhancing pedestrian perceived safety through walking environment modification considering traffic and walking infrastructure. Front. Public Health 11:1326468. doi: 10.3389/fpubh.2023.1326468

Available online:

Frontiers | Enhancing pedestrian perceived safety through walking environment modification considering traffic and walking infrastructure (frontiersin.org)

Dimension 4: Environment

4.1 Increase of use of zero emission modes	
Outcome indicator, Outcome 1	
Use of transport should increase amongst the modes of transport that reduce the air pollution in the LL. This can be for example cycling, walking, e-scooter, public transport etc. Here it will be not necessary to measure the reduction in air pollution, but the increase of use for services that contribute	
Unit	%
City relevant	
How: Measure result	Measure use of mobility: This can be done by comparing the modal split before and after the intervention. It will need to be clear how the intervention increases people's accessibility, ability, motivation and security in using zero emission modes. A measurable impact on the uptake of those means of transport by comparing the situation before and after the implementation of the intervention will need to be validated. For this, select a representative area within the LL where you can collect the data over time. **Count the number of people using zero emission modes of transport:** Option 1: Modal split according to passenger kilometres ran: total number of passenger kilometres ran for each mode within an urban area compared to the total number of passenger kilometres ran for all modes within an urban area. Option 2: Modal split according to number of trips: total number of trips for each mode within an urban area compared to the total number of trips for all modes within an urban area. Make sure to collect information on the types of transport used, so it can be very clear that these are zero emission modes. **Rate satisfaction with infrastructure:** Good quality means that the streets meet at least one of the following requirements: • good bike lanes (minimum 1.5 meters one-way and 2.5 meters two ways) • a 30 km/h (or 20 mph) speed regime or below • car free • dedicated paths and links of at least 50m in length that are off-street
Frequency	Before and after implementation
Collection methods	Survey, Parking counts, Counting sensors and traffic/speed management, Road data from controlled intersection & related devices
Target	Min of 5% increase
Project management relevant	
Project-wide target	Original name: In all Living Labs: Min. 5% increase in use of zero-emission modes as means of transportation (e.g., biking, walking, etc.) **All LLs**
Cities contributing	
Cities not decided yet	

Sources	Civitas SUMI "Modal Split", Civitas evaluation framework key indicator no. 14

4.2 Reduction of emissions	
Outcome indicator, Outcome 1	
Carbon dioxide emission reductions from the use of energy could be achieved by fuel conversion, increased efficiency, reducing energy demand and increased use of non-fossil energy sources. There needs to be an estimated 10% reduction of emission in LLs. It will need to be estimated as it will likely not be possible for cities to achieve that aim using this test bed of the LL. What needs to be evident is a development through the intervention that, at scale, will lead to the targeted reduction of emissions. This can be defined by observing the shift of modes of transport that will reduce air pollution at scale, by people's satisfaction with the changes of the intervention.	
Unit	%
City relevant	
How: Measure result	Measure use of mobility: This can be done by comparing the modal split before and after the intervention. A measurable impact on the uptake of those means of transport by comparing the situation before and after the implementation of the intervention needs to be validated. For this, select a representative area within the LL where you can collect the data over time. Secondly, working with users and collecting data about their opinions and satisfaction with the intervention. Looking at overall parameters such as the perception of safety, the increase of accessibility for users from diverse groups. Lastly, you can also measure emissions in the air by using technology. **Count the number of people using zero emission modes of transport:** Option 1: Modal split according to passenger kilometres ran: total number of passenger kilometres ran for each mode within an urban area compared to the total number of passenger kilometres ran for all modes within an urban area. Option 2: Modal split according to number of trips: total number of trips for each mode within an urban area compared to the total number of trips for all modes within an urban area. **Measure the satisfaction of users:** User/provider/stakeholder average reported satisfaction with • the overall quality of the transport system (public transport, cycling, walking, etc.) • the quality of a specific service It measures the experience of the user/provider, against its expectations. Unit: % of shares with a qualitative score (1-5) of the perception of quality **Measure emissions:** CO2 emissions is defined as the average CO2 emissions per vehicle-km by vehicle and fuel types or by city resident/system user Unit: g/vkm or tonnes of CO2 Vehicles: car, bus, lorry, tram, metro. For road vehicles, vehicle split should be based on the COPERT category. Fuels: petrol, diesel, electricity, liquefied petroleum gas (LPG), natural gas, alcohol mixtures, hydrogen and biofuels

	CO_2 emissions can be measured by many methods including field trials or modelling.
Frequency	Before and after implementation
Collection methods	Survey, Simulation software & digital tools, Parking counts, Counting sensors and traffic/speed management, Public and private service data base, Road data from controlled intersection & related devices, CO_2 sensors, air quality sensors
Target	Min of estimated 10% decrease
Project management relevant	
Project-wide target	Original name: In all Living Labs: Min. 10% estimated reduction of emissions **All LLs**
Cities contributing	
Cities not decided yet	
Sources	Civitas SUMI “Modal Split”, SUMI “User satisfaction”, Civitas evaluation framework key indicator no 24

4.3 Reduction in exposure to air and noise pollution	
Outcome indicator, Outcome 3	
The scaling of the solutions is expected to reduce the road user’s exposure to air and noise pollution by 10% min. What is important to show a clear link between the intervention and the aimed outcomes. It will be unlikely possible for cities to show data of the achieved aim, but measured data of the test results should point into that direction.	
Unit	Number
City relevant	
How: Measure result	It is important to collect data around air and noise pollution before the implementation. This will enable cities to calculate a % in reduction. For the reduction in air pollution, there are several options. Using sensors and collecting data about air pollutants would be good baseline data to have but will be unlikely to prove any reduction after the small-scale interventions. Although it will be useful for measuring again after the solution has scaled. More proxy measures are needed to indicate a shift and suggested trend. - Cities can estimate the reduction by looking at the reduction in traffic. - They can look at an increase of modal split around active modes of transport (walking, cycling etc.) In terms of qualitative data, it is possible to collect feedback from mobility users of the relevant areas. This can be - Perception of change in air or noise pollution - User satisfaction around safety and accessibility for active modes of transport
Where: Scale	LL
Frequency	Before and after implementation
Collection methods	

Target	10 % reduction
Project management relevant	
Project-wide target	Original name: Scaling up and assessment of the showcased solutions for the 12 LLs will result in increased estimation 10% as regards reduction in exposure to air and noise pollution **All LLs**
Cities contributing	
Cities not decided yet	
Sources	
Reference	Civitas SUMIs “Modal Split”, “Air pollutant emissions”, “Noise”, “Quality of public spaces”

4.4 Climate city contracts supported	
Outcome indicator, Outcome 1	
The interventions need to contribute to the cities SUMPs, having a clear impact on the mission.	
Unit	Number
City relevant	
How: Measure result	Proof impact of the intervention towards SUMP Cities will need to clearly and logically make the conclusion from input to impact. It must be clear how the intervention will contribute to the city's mission by addressing some of the challenges and root causes in place. It is necessary to provide data that proves the assumption that the intervention is supporting the SUMP.
Frequency	After implementation
Collection methods	
Target	Min of one mission statement supported
Project management relevant	
Project-wide target	Original name: No of Climate City Contracts supported (10) **Min 10 LLs**
Cities contributing	
Cities not decided yet	
Sources	

4.5 Addressing Zero Emission targets	
Outcome indicator, Outcome 2	
Counting the number of LLs addressing Zero Emission targets. This can also be part of local SUMPs in some cities. There needs to be clear that the intervention is addressing zero emission goals stated in SUMPs, climate city contracts or ELABORATOR proposal.	
Unit	Number
City relevant	
How: Measure result	For cities, they need to make clear how the intervention is addressing those targets. This can be useful to know what was intended and how testing and

	implementation affected those goals. It would be good to understand which intervention has been proven to address those goals.
Frequency	After implementation, optionally also before to see the intentions.
Collection methods	
Target	Min of one intervention that influences zero emission targets
Project management relevant	
Project-wide target	Original name: No of LLs addressing Zero Pollution Targets **Min 3 LLs**
Cities contributing	
Cities not decided yet	
Sources	

4.6 Increase of quality-adjusted life years	
Outcome indicator, Outcome 6	
This impact is expected to be generated by an uptake of active transport modes. That shift will increase the air quality and therefore improve the overall health of citizens. This is a long-term impact and will be difficult to measure in such a short time frame and limited scale of the LLs. What will be important is to look at the intention cities aim for to increase the use of active modes of transport which will then reduce air pollution.	
Unit	%
City relevant	
How: Measure result	**Measure uptake** in active and zero emission mobility modes. Please refer to impact KPI 6.2 "Increase of desired modal split" for more information on how to measure this. **To measure improved air quality** and health outcomes long term (after ELABORATOR is finished) it is also possible to collect data on emissions and air pollutants. For that, cities can use sensors to collect information about the emissions in the air. Furthermore, they can use counting sensors to check a long-term development of decreasing air polluting modes of transport.
Frequency	Before and after implementation
Collection methods	Survey, Counting sensors and traffic/speed management, Public and private service data base, Road data from controlled intersection & related devices, CO2 sensors, air quality sensors
Target	
Project management relevant	
Project-wide target	Original name: No. of LLs increase estimated no. of quality-adjusted life years due to uptake of active modes and changes in air quality resulting from intervention **All LLs**
Cities contributing	
Cities not decided yet	
Sources	Civitas SUMIs "Modal Split", "Air pollutant emissions for DG MOVE", "GHG Emissions for DG MOVE"

4.7 Supporting circular economy principles and cross sectoral synergies	
Outcome indicator, Outcome: 7	
This KPI will look at the number of LL supporting circular economy principles with the implementation of their intervention. "With urbanisation and the demand for urban freight rapidly increasing, the need for more effective urban mobility solutions is pressing. Given this, circular economy principles to design out waste and pollution, keep materials in use and at value, and regenerate natural systems provide the much-needed solution. A circular urban mobility system focuses on effectively accommodating the user's mobility needs by diversifying modes of transport. Core benefits of a circular economy development path include reducing virgin material consumption from the mobility sector, eliminating waste and pollution, maximising infrastructure and vehicle utilisation, and lowering use and operation costs."[15] To help reduce waste, pollution and maximising infrastructure, it is helpful to consider cross-sectoral synergies. Finding ways for cities to implement solutions that will enable synergies between city departments, organisations, community groups and citizens can create more impact in the long term.	
Unit	Number
City relevant	
How: Measure result	Proof impact of the intervention towards SUMP Cities will need to clearly and logically make the conclusion from input to impact. It must be clear how the intervention will contribute to the city's mission by addressing some of the challenges and root causes in place. Data proving the assumption the intervention supports the SUMP must be provided.
Where: Scale	LL
Frequency	After implementation
Collection methods	Survey, Simulation software, digital tools, Parking counts, Counting sensors and traffic/speed management, Public and private service data base, Road data from controlled intersection & related devices, CO2 sensors, air quality sensors
Target	Min of one circular economy principle supported
Project management relevant	
Comments	Original name: No. of LL supporting circular economy principles and cross sectoral synergies **Min 2 LLs**
Cities contributing	
Cities not decided yet	
Sources	Ellen McArthur Foundation "Circular Economy in Cities: Opportunity and benefit factsheet", 2024 (https://www.ellenmacarthurfoundation.org/circular-economy-opportunity-and-benefit-factsheets)

4.8 Adapting to climate change

[15] Ellen McArthur Foundation "Circular Economy in Cities: Opportunity and benefit factsheet", 2024 (https://www.ellenmacarthurfoundation.org/circular-economy-opportunity-and-benefit-factsheets)

Outcome indicator, Outcome 7	
This indicator requires the number of interventions that help cities to adapt to climate change. "Cities face significant impacts from climate change, both now and into the future. These impacts have potentially serious consequences for human health, livelihoods, and assets, especially for the urban poor, informal settlements, and other vulnerable groups. [...] Climate change adaptation is the process of preparing for, and adjusting proactively to, climate change—both negative impacts as well as potential opportunities. Cities are often the first responders to climate impacts. [...] The starting point in managing risks and building long-term resilience is for a city to understand its exposure and sensitivity to a given set of impacts and develop responsive policies and investments that address these vulnerabilities. [...] A resilient city is prepared for existing and future climate impacts, limiting their magnitude and severity. [...] Through both formal planning activities and informal preparations, cities can build their capacity to adapt effectively to existing and future climate impacts, while also experimenting and innovating in policy making and planning." [16]	
Unit	Number
City relevant	
How: Measure result	There are two ways in which cities can contribute to this KPI. Option one is to show how in what way the intervention is equipped to address impact of climate change quickly. To have policies and solutions in place that are adaptable. That option is more looking at set up and procedures in which solutions are deployed to flex around new situations in the future. Option two is to show how the intervention is preparing for the impact of climate change. How the intervention is actively mitigating or lowering the negative effects that climate change will have on mobility and life of citizens.
Frequency	After implementation
Collection methods	Survey, Simulation software, digital tools, Counting sensors and traffic/speed management, Public and private service data base, Road data from controlled intersection & related devices, CO2 sensors, air quality sensors
Target	Min of one option from the ways to measure result is addressed with the intervention
Project management relevant	
Project wide target	Original name: Number of LLs addressing adaptation to climate change **Min 4 LLs**
Cities contributing	
Cities not decided yet	
Sources	Climate ADAPT "Guide to Climate Adaptation in Cities", 2011 (https://climate-adapt.eea.europa.eu/en/metadata/guidances/guide-to-climate-change-adaptation-in-cities/11237802)

[16] Climate ADAPT "Guide to Climate Adaptation in Cities", 2011 (https://climate-adapt.eea.europa.eu/en/metadata/guidances/guide-to-climate-change-adaptation-in-cities/11237802)

4.9 Mitigate extreme heat	
Outcome indicator, Outcome 7	
Elements of the intervention should contribute to mitigate extreme heat conditions in your city. Extreme heat as part of climate change is already a vast problem leading to negative impact on citizens' health. The problem is expected to increase in the future. Cities which will contribute to this project KPI need to show effort in addressing this problem and ideally reducing the impact extreme heat will have on vulnerable groups of people, who are most affected. This can be done in several ways. The progression and heat increase need to be understood by collecting and analyzing the right data. This data combined with qualitative research can inform about the areas in the city and groups of people that are most affected. There can be several tactics for cities to mitigate heat. In the context of ELABORATOR, the strategies that seem most effective are vegetation and green areas, materials and building decisions to create cool roofs and pavements, green roofs and walls, alternative cooling and shading methods and to include heat reduction as a criterion in urban planning. [17]	
Unit	Number
City relevant	
How: Measure result	Showcase ideas and solutions that will reduce the temperature. These ideas need to have a potential for creating a real impact on the experience that people have being mobile in the city.
Frequency	After implementation
Collection methods	Simulation software, digital tools, Counting sensors and traffic/speed management, Public and private service data base, Road data from controlled intersection & related devices, CO2 sensors, air quality sensors
Target	Min of one solution is addressed with the intervention
Project management relevant	
Project-wide target	Original name: No. of LL improving streetscape to mitigate the effects of extreme heat **Min 6 LLs**
Cities contributing	
Cities not decided yet	
Sources	C40 Knowledge Hub "How to adapt your city to extreme heat", 2019 https://www.c40knowledgehub.org/s/article/How-to-adapt-your-city-to-extreme-heat?language=en_US#:~:text=Trees%20cool%20cities%20by%20shading,Cool%20roofs.

4.10 Air pollutant emissions
SUMI 3

[17] C40 Knowledge Hub "How to adapt your city to extreme heat", 2019

https://www.c40knowledgehub.org/s/article/How-to-adapt-your-city-to-extreme-heat?language=en_US#:~:text=Trees%20cool%20cities%20by%20shading,Cool%20roofs.

Pollutants emitted by transport activities contribute to ambient air pollution and put significant pressures on the environment and human health. Significant policy efforts, although with differences across modes, have addressed transport-related air pollution in recent decades and have led to some improvements. The indicator measures the air pollutant emissions of all passenger and freight transport modes in the urban area. Emissions from the transport sector are regulated by vehicle emissions standards and fuel quality requirements.	
Unit	Emission harm equivalent index [kg PM2.5 eq./cap per year] The indicator value corresponding to this parameter value is on a scale from 0 to 10: • 0 indicates the worst condition of air pollutant emissions (when the value of the parameter is higher than 2.15 kg of PM2.5 equivalent per capita) • 10 indicates the best condition (when the value of the parameter is 0 kg of PM2.5 equivalent per capita).
City relevant	
How: Measure result	This indicator measures the total emission of air pollutants per capita emitted by city transport. It is calculated by conversion of the total vehicle-kilometers per capita into a corresponding number of pollutants. STEP 1: converting vehicle-kilometers into total emission of the different pollutants STEP 2: converting the emissions of the different pollutants into one common value. This is expressed in the following formula: $$\mathrm{EHI}=\frac{\sum_s Eq_s*(\sum_{ij} A_{ij}*(\sum_{ck} S_{ijk}*E_{ijkcs}*I_k))}{Cap}$$ • EHI = Emission harm equivalent index [kg NOx eq./cap per year] • Eeqs = Emission substance type equivalent health impact value [factor] Eijkcs= Emission of pollutant s per unit of energy consumed for fuel type k, emission class c of vehicle type j of transport mode i (g/l, g/kg) • Aij= Activity volume (distance driven by transport mode I and vehicle type j) [million km per year] • Sijk = Share of fuel type k per vehicle type j and per transport mode I [fraction] • I k = Energy intensity per distance driven per fuel type k [l/km or kWh/km or kg/km] • Cap = Capita or number of inhabitants in the city [#] • k = Energy type (petrol, diesel, bio-fuel, electricity, hydrogen, etc.) [type] i = Vehicle type transport mode (passenger car, tram, bus, train, motorcycle, inland vessel, freight train, truck, etc.) [type] • j = Vehicle class (if available specified by model (e.g. SUV, etc.) [type] • s = Type of substance [type] limited to NOx and PM10 • c = Emission class (euro norm) [type]
Where: Scale	Can be available at the city level. However, in the project: consider the intervention level – and potentially discuss the scaling up.
Frequency	Can be an indicator, which is collected daily by the municipalities. In the project level: before and after the interventions have been installed.

Collection methods	Survey, Simulation software, digital tools, Counting sensors and traffic/speed management, Public and private service data base, Road data from controlled intersection & related devices, CO2 sensors, air quality sensors Traffic modelling Field survey (traffic counts on representative locations, or enquiring people's trip behavior) City databases if existing" In practice, it may not be possible to measure pollutant emissions on the reduced scale of an intervention, as accuracy may be affected by too many factors external to the intervention.
Target	
Sources	
Reference	

4.11 Energy efficiency	
SUMI 9	
The efficient use of energy contributes to less energy consumption and the reduction of greenhouse gases released to nature, thus improving environmental sustainability. Energy efficiency indicator is used to assess the progress in energy efficiency and to measure energy savings.	
Unit	Energy consumption rate (MJ/KM)
City relevant	
How: Measure result	This indicator relates final energy consumption to transport performance, as it is related to passenger and tonne kilometer. Total energy use by urban transport per passenger km (public transport) and tonne km (freight), annual average over all modes). $E=\frac{(\sum_{ij} A_{ij}(\sum_k S_{jk}*I_{jk}*EC_k))}{TV_{pass}+\left(\frac{TV_{fre}}{8}\right)}$ • E = Energy consumption rate [MJ/km] • TVpass = Transport volume passenger transport (passenger km) [million passenger km] • TVfre = Transport volume freight transport [million tonne km] • Sjk = Share of fuel type k per vehicle type j [fraction] • Ijk = Energy intensity per distance driven for vehicle type j and fuel type k [l/km or MJ/km or kWh/km] • Aij= Activity volume (distance driven by transport mode I and vehicle type j) [million km per year] • ECk = Fuel energy content for fuel k [MJ/l or MJ/kg] • k = Fuel type [type] • i = Transport mode (passenger car, tram, bus, train, motorcycle, inland vessel, freight train, truck, etc.) [type] • j = Vehicle class (if available specified by model e.g. SUV, etc.) [type]
Where: Scale	Intervention area / Neighborhood scale

Frequency	To rate energy efficiency: After implementation For improvement: Before and after implementation
Collection methods	Survey, Simulation software, digital tools, Counting sensors and traffic/speed management, Public and private service data base, Road data from controlled intersection & related devices, CO2 sensors, air quality sensors • Traffic modelling • Field survey (traffic counts on representative locations, or enquiring people's trip behavior) • City databases if existing Provide information on transport volumes, vehicle stock composition and fuel consumption factors, based on the available level of detail. Other data sources can be used as reference, e.g.: - For vehicle fleet and fuel consumption factors: data at country level (Eurostat for fuels, national statistics / modelling for emission standard). Default values for fuel consumption can be found in the sheet "default values". - For vkm, pkm, tkm by vehicle type: estimation from aggregated tool at urban level (related data input required from the urban area).
Target	
Sources	SUMI 9
Reference	

4.12 Noise hindrance	
SUMI 4	
Hindrance of population by noise generated through city transport. Long-term exposure to noise from transport has negative effects on physical and mental health. Road traffic is by far the most dominant source of environmental noise. Noise from railways and aircraft has a much lower impact in terms of the overall population, but both are significant sources of local noise pollution.	
Unit	%
City relevant	
How: Measure result	The percentage of population hindered by city transport noise is based on random noise measurements. The number of people annoyed by traffic noise is based on field measurement of Lden at locations near a representative random selection of houses of city inhabitants. Locations must be in different types of living environments in the city (for city scale: near highways, ring roads, access road, near sensitive functions, recreation zones...) The difficulty to measure traffic noise in a city is that: - Ideally many noise measurements are needed - The measurements should cover a sufficiently long period (ideally at least 24 hours) - Only the impact of traffic noise should be included

	The definition of the formula is based on the noise maps and noise exposure data available from the "Noise Observation and Information Service for Europe" of the European Environment Agency (EEA). $NI = \frac{\sum_i HFLden_i * (\sum_m W_{im} * P_{im})}{\sum_{im} W_{im} * P_{im}}$ NI = Noise hindrance index [% of population] i = Average noise Lden of noise band [#] Pim = Population exposed to noise band i for mode m (road, rail, airplane) [#] Wim = High Annoyance weight factor for mode m and noise band i [%] HFLDeni = Hindrance factor at average Ldeni of the related noise band i LDen= Average sound pressure level over all days, evenings and nights in a year (in this compound indicator the evening value gets a penalty of 5 dB and the night value of 10 dB).
Where: Scale	Can be available in the city level. However, in the project: consider the intervention level – and potentially discuss the scaling up. Ideally, measurements should cover a sufficiently long period (24 hours) in various locations around the intervention site.
Frequency	Can be an indicator, which is collected daily by the municipalities. In the project level: before and after the interventions have been installed.
Collection methods	Survey, Simulation software, digital tools, Counting sensors and traffic/speed management, Public and private service data base, Road data from controlled intersection & related devices, CO2 sensors & air quality sensors Field Survey Sound level meters at selected locations Municipalities should check information availability on noise maps and noise exposure data available from the European Environment Agency (EEA) database.
Target	
Sources	SUMI 4
Reference	

4.13 Greenhouse gas emissions (GHG)	
SUMI 7	
Emissions of greenhouse gases (GHG) by all city passenger and freight transport modes. Many international organizations and more city authorities regard this indicator as crucial to urban mobility policy. It directly refers to the impact on climate change.	
Unit	Tonne CO2 equivalent emissions by urban transport per annum per capita
City relevant	
How: Measure result	This indicator measures the total emission of greenhouse gases per capita emitted by all city transport modes (freight and passenger, public and private). It is calculated by the conversion of the total vehicle-kilometers per capita into a corresponding amount of greenhouse gases.

	The total amount city transport greenhouse gases are calculated from the total amount of vehicle-kilometers per mode and per vehicle type in the following steps: - STEP 1: converting vehicle-kilometers per type of vehicle and fuel into total emissions of the different greenhouse gases - STEP 2: converting the emissions of the different greenhouse gases into CO2 equivalents - STEP 3: converting tailpipe emissions (pump-to wheel) into well-to-wheel emissions. This is expressed in the following formula: $G = \frac{(\sum_{ij} A_{ij} (\sum_k S_{jk} * I_{jk} * (C_k (1 + F_{ijk}) + W_k)))}{Cap}$ • G = Greenhouse gas emission [tonnes CO2(eq.) /cap. per year] • Ck = Tank to wheel CO2 emission per energy type unit considered [kg/l or kg/kWh] • Wk = Well to tank CO2 equivalent emission per energy type unit considered [factor] • Aij = Activity volume (distance driven by transport mode I and vehicle type j) [million km per year] • Sjk = Share of fuel type k per vehicle type j [fraction] • I jk = Energy intensity per distance driven for vehicle type j and fuel type k [l/km or MJ/km or kWh/km] • Cap = Capita or number of inhabitants in the city [#] • Fijk = Non-CO2 GHG correction (CO2 equivalent) [factor] • k = Energy type (petrol, diesel, bio-fuel, electricity, hydrogen, etc.) [type] • i = Transport mode (passenger car, tram, bus, train, motorcycle, inland vessel, freight train, truck, etc.) [type] • j = Vehicle class (if available, specified by model (e.g. SUV, etc.) [type]
Where: Scale	Can be available at the city level. However, in the project: consider the intervention level – and potentially discuss the scaling up.
Frequency	Can be an indicator, which is collected regularly by the municipalities. In the project level: before and after the interventions have been installed
Collection methods	Survey, Simulation software, digital tools, Counting sensors and traffic/speed management, Public and private service data base, Road data from controlled intersection & related devices, CO2 sensors, air quality sensors The total number of vehicle-kilometers is preferably collected by means of a traffic model. Alternative methods are field surveys (traffic counts on representative locations) or surveys (enquiring about people's trip behavior). Of course, if the vehicle kilometers are available in existing city databases on mobility, they can be used too.
Target	
Sources	SUMI 7
Reference	

4.14 Air surface temperature regulation	
Other	
Surface air temperature is the temperature of the air measured at a height of around two meters above the surface. Thermometers, shielded from direct solar energy, are used to measure surface air temperature.	
Unit	Decimal degree
City relevant	
How: Measure result	This indicator can be relevant when a city aims for a reduction of temperature, especially during summer months and heatwaves. This can be interventions introducing shading (greening or construction) or using specific materials (reflection or condensation). The advantage of this indicator is that a result can be measured short-term. Based on that, simulation or calculation can be done to estimate the impact at scale and in the long-term. It can be measured by installing temperature sensors 2 meters above the ground.
Where: Scale	A comparison of locations should be made. Installing the sensors in a place where the intervention had been implemented and in a spot without intervention can provide concrete and more accurate data on how the intervention has impacted on the temperature development.
Frequency	Besides multiple locations, there should be a measurement before and after the implementation. The data should also be collected over at least one month during summer. This way the average temperature as well as heatwaves can possibly be captured as part of the data collection
Collection methods	Survey, Simulation software & digital tools, Road data from devices, Public and private service data base, Road data from controlled intersection & related devices, CO2 sensors & air quality sensors
Target	At least 1 degree for a range of ideal conditions. Check EEA 202 report on climate change adaptation in urban areas.
Sources	The definition of air and surface temperature in public spaces has been explored in various studies. Kariminia (2011) established an acceptable thermal comfort range for urban outdoor spaces in a temperate and dry climate, while Maras (2016) found that perceived thermal comfort is influenced by atmospheric conditions such as air temperature. Tong (2018) investigated the correlation between air temperature and urban morphology parameters. [18] https://www.eea.europa.eu/publications/urban-adaptation-in-europe

4.15 Water management regulation	
Other	
The amount of water estimated to be re-addressed in a more sustainable cycle by the intervention. As a result of climate change, there can be longer periods of drought than expected. At the same time there is a development of stronger storms and increased rainfall in short time periods, which is causing flooding.	
Unit	liters / time frame depending on the duration of the intervention

[18] https://www.eea.europa.eu/publications/urban-adaptation-in-europe

City relevant	
How: Measure result	To use this indicator, the city needs to have a strategy on what the ideal state would be. If flooding is the main challenge, the interventions will need to aim for a better distribution of rainwater in a short period of time. If drought has been the main issue, then the city will need to find new ways of using water more efficiently, storing and distributing water where needed. For the ELABORATOR project, it would need to be evident that the intervention has the potential in fulfilling any of those desired outcomes. It is appreciated that during the project timeframe it might not be possible for cities to measure the exact liters of water that are managed more efficiently. To still use this indicator, it can be a calculation and estimation based on historic data and technical reports. Data that can be used: - Weather data - Water consumption - Water distribution - Water shortage - Water abundance - Predicted water requirements Data that can help with proving the capabilities of strategies or technology used: - Potential to save water - Distribute more efficiently - Collect and store water - Measures to prevent flooding
Where: Scale	Area of the intervention and of the wider region
Frequency	Looking at historic data not older than 2 years
Collection methods	Public and private data sources
Target	
Sources	The European Union's environmental policy, including the Water Framework Directive, plays a key role in this area, but there is still a need for more specific guidelines and measures (Yannopoulos, 2014; Giannopoulos, 2011). The World Health Organization and its Regional Office for Europe are also involved in the implementation of health-based guidelines for water supplies in Europe, emphasizing the importance of risk assessment and management (Aertgeerts, 2004). Furthermore, the potential for water recycling in Europe is discussed, with a call for a more defined framework and specific guidelines (Hochstrat, 2008).
Reference	

4.16 Biodiversity
Other
Biodiversity improvement index" quantifies the positive changes in species richness and ecosystem diversity resulting from urban planning initiatives or nature-based solutions. It assesses the effectiveness of interventions aimed at enhancing biodiversity within urban environments, providing a measurable metric to evaluate the success of conservation efforts. This index considers factors such as the abundance and distribution of flora and fauna, habitat quality, and ecological connectivity. By tracking changes in biodiversity over time, it guides decision-making processes

towards sustainable urban development practices that prioritize the preservation and restoration of natural ecosystems within cities.	
Unit	Percentage increase
City relevant	
How: Measure result	"Biodiversity improvement" refers to the measurement of the variation and increase in biodiversity within a specific area, typically attributed to urban planning interventions or projects that promote the presence of natural habitats and species diversity within an urban environment. This index is pivotal for evaluating the effectiveness of Nature-Based Solutions (NBS) in enhancing urban biodiversity and ecosystem quality. "Percentage increase in biodiversity," calculated by comparing the number of plant and animal species present in an area before and after the implementation of nature-based solutions. This measure provides a clear indication of the success of actions taken to improve urban biodiversity and can be used to monitor progress over time.
Where: Scale	Intervention area
Frequency	At the end of the implementation
Collection methods	Simulation software & digital tools, Road data from devices, Public and private service data base, Road data from controlled intersection & related devices
Target	
Sources	

Dimension 5: Social

5.1 Toolkits adopted and deployed	
Outcome indicator, Outcomes 2 and 3	
One of the aims of the project is to collect and share rich information sets made of real data, traces from dedicated toolkits, users' and stakeholders' opinions among the cities, to increase the take up of the innovations via a twinning approach. Therefore, the adoption and deployment of the technological toolkits is key to achieve this goal, since they serve as instruments for active participation, data platform, and visualization tools.	
Unit	Number of toolkits adopted and deployed
How: Measure result	Cities to contribute to this KPI should clearly show they have used at least one toolkit, and described it in the following 3 stages: 1. Before: explain the purpose in using the selected toolkit and, its relationship with the intervention. 2. During: show evidence of the usage of the toolkit, where and how it is used. 3. After: show the results obtained and its usage for active participation, data platform, and visualization tool.
Where: Scale	Intervention scale
Frequency	During the project
Collection methods	

Target	At least 1 toolkit deployed
Project management relevant	
Project wide target	Original name: No. of new cities to adopt toolkits for active participation, data platform and visualization tool (min. 10); 12 participant cities and at least 5 Observer or new cities will deploy the technological toolkits for active citizens participation, data platform and visualization tool. **Min: 12 participant cities and at least 5 Observer or new cities.**
Cities contributing	
Cities not decided yet	
Sources	Elaborator DoA - Outcome indicators.
Reference	D2.4 Active Citizen Toolkit

5.2 Focus group consultation	
Outcome indicator, Outcome 4	
Number of citizen and stakeholder focus groups consulted through active citizens participation from diverse user groups.	
Unit	Number of focus groups
How: Measure result	$TFG = FG_B + FG_A$ Where: TFG: Total of citizen and stakeholder focus groups consulted. FG_B: Citizen and stakeholder focus groups consulted before the intervention. FG_A: Citizen and stakeholder focus groups consulted after the intervention.
Where: Scale	According to the stakeholders' map.
Frequency	Measurements should be made at least twice during the project, i.e. before the intervention is introduced (baseline) and at the end of the project (after).
Collection methods	
Target	12 or more total focus groups (TFG).
Project management relevant	
Project wide target	Original name: For all LLs: Conduction of at least 12 citizen and stakeholder focus groups consulted through active citizens participation from diverse user groups. **Min: 12 cities**
Cities contributing	
Cities not decided yet	
Sources	Elaborator DoA - Outcome indicators.
Reference	D2.1 Inclusion Plan

	D2.3 Participatory tool playbook

5.3 Use of engagement apps	
Outcome indicator, Outcome 4	
Engagement apps for active participation play a pivotal role in fostering inclusivity within mobility and public space interventions by facilitating efficient communication, collaboration, and feedback mechanisms. This indicator evaluates if and how are this apps being used in the project.	
Unit	Number of apps used
How: Measure result	To contribute to this outcome indicator, cities need to prepare a description for WP7 leaders and project management. It should include information on which apps will be used and how.
Where: Scale	Intervention scale
Frequency	During the project
Collection methods	
Target	At least 1 app used
Project management relevant	
Project wide target	Original name: Engagement apps used in at least 6 LLs **Min: 6 cities**
Cities contributing	
Cities not decided yet	
Sources	Elaborator DoA - Outcome indicators.
Reference	D2.1 Inclusion Plan D2.3 Participatory tool playbook

5.4 Satisfaction with public transport	
SUMI 12	
This indicator measures the satisfaction of the population in relation to public transport. It has been designed to analyse results from the European Commission's Urban Audit, a perception survey on quality of life in European cities, which is being conducted by Eurostat based on telephone interviews on a regular basis. The parameter is an averaged score of survey responses about a respondent's perception of satisfaction of using public transport.	
Unit	
City relevant	
How: Measure result	The average reported satisfaction of moving in the urban area by public transport. 1) Generally speaking, please tell me if you are [1] satisfied, [2] rather satisfied, [3] rather unsatisfied, [4] not at all satisfied, or [5] don't know/ not applicable (do not read out), with public transport (for example the bus, tram or metro) in your city or area.

	2) Thinking about public transport in your city, based on your experience or perceptions, please tell me whether you strongly agree, somewhat agree, somewhat disagree, strongly disagree, or DK/NA (do not read out), with each of these statements. Public transport in your city is: • Affordable • Safe • Easy to get • Frequent (comes often) • Reliable (comes when it says it will) $\overline{SAT} = \frac{\sum_m \overline{ASPECT}_m}{m}$ m *being the number of aspects (dimensions)* $\overline{ASPECT}_m = \sum_h \overline{AGREE}_{h,m}$ h *being the four replies of the agreement scale:* *(strongly agree, somewhat agree, somewhat disagree, strongly disagree)* $\overline{AGREE}_{h,m} = \frac{\#times\ agreement\ h\ was\ used\ in\ sample\ for\ aspect\ m}{\#people\ sample\ of\ aspect\ m - \#\frac{DK}{NA} answers\ in\ sample\ m} x C_h$ $C_{h=strongly\ agree} = 10;\ C_{h=somewhat\ agree} = 6.66;\ C_{h=somewhat\ disagree} = 3.33$ $C_{h=strongly\ disagree} = 0$
Where: Scale	Can be available at the city level. However, in the project: consider the intervention level – and potentially discuss the scaling up.
Frequency	Can be an indicator, which is collected regularly by the municipalities. In the project level: before and after the interventions have been installed
Collection methods	2 interviews, 3 Workshop, 4 Survey Surveys • The survey method used should use criteria for reaching a representative sample of the population. • There are three options for getting the data to calculate this indicator 1) Check whether your city has been part of the EC's Urban Audit in 2019 or 2015. The list of cities is included in the results from the surveys ("Eurobarometer Flash") 2) Your city collects the necessary data for this indicator by conducting a small survey using the same questions. This could also be integrated into a larger survey. The questions can be embedded in existing transport, social attitudes or other panel

	surveys to minimise costs, maximise sample size and reduce the risk of survey bias 3) Use the data from a survey on satisfaction with public transport conducted in your city. Most often, the city's public transport operator conducts such surveys with their passengers regularly.
Target	
Sources	SUMI 12
Reference	D2.1 Inclusion Plan D2.3 Participatory tool playbook

5.5 Affordability of public transport for the poorest group	
SUMI 1	
Share of the poorest quartile of the population's household budget required to hold public transport (PT) passes (unlimited monthly travel or equivalent) in the urban area of residence. This indicator evaluates the ability to make necessary journeys to work or school, for health and other social services, and to make visits to other family members and friends or other urgent journeys, especially within the city without having to curtail other essential activities.	
Unit	Score (number)
City relevant	
How: Measure result	The definition suggests that the cost of transport must be seen in relation to the household budget (extracted from socio-economic statistical databases). SCORE = (Price monthly PT pass * average household size) / income of the 25% poorest residents of the urban area. 1) The **price of the monthly PT pass** should come from the PT authority of the urban area, or the operating company. In the case of multiple operating companies, wherever possible the price sought should refer to unlimited travel on all operators' services in the entire urban area. Only if there is no integrated pass allowing travel on the services of all operators, then the sum for all the operators should be calculated by adding the prices for each operating company. 2) The **average household size** is either available directly from the municipality or the national statistical office, or it can be calculated by dividing the number of residents by the number of households in the area. Average household size is relatively stable, and estimates from previous years, or a recent census exercise, could also be applied. 3) The **monthly income of the 25% poorest inhabitants** (average) and the monthly expenditure for transport services for the 25% poorest inhabitants (average) should usually come from a household expenditure survey. These surveys are normally conducted by national statistical institutes regularly.
Where: Scale	Can be available at the city level. However, in the project: consider the intervention level – and potentially discuss the scaling up.

Frequency	Once every 5 years?
Collection methods	interviews, Workshop, Survey, Public and private service data base, public transport operational data Public Transport authority National statistical institutes Municipality surveys
Target	
Sources	
Reference	D2.1 Inclusion Plan D2.3 Participatory tool playbook

5.6 Security	
SUMI 18	
Reported perception about crime-related security in the city transport system (including freight and public transport, public domain, bike lanes and roads for car traffic and other facilities such as car or bike parking). This indicator covers the reported perception about crime-related security in city transport system by general population based on the following topics: • Public transport • Public transport in the evening • Walking • Walking on the street at night • Cycling • Cycling at night • Car theft • Risk of crime in car traffic The perceived security is an important issue in the frame of sustainable urban transport because security should give users confidence that they can use transport. The lack of confidence can lead to non-compliance with mobility needs. Perceived security related to crime covers day and night situations in different transport mode environments such as (underground) parking, streets and squares, stations and bus stops, public transport rides, etc. It includes property offences, physical offences against passengers and offences against operatives.	
Unit	Score (number)
City relevant	
How: Measure result	A survey can be conducted to obtain the reported perception about crime-related security in the city transport system (refer to the list of topics in the upper section or in the link below in the "source" section). The number of surveyed people across the different transport modes should approximately match the modal split in your urban area. In addition, women transport users should be adequately represented in the survey. The target population is users and non-users of different transport modes.

	Only one person per family, per shop, education institution or workplace is to be questioned. It must be clearly marked if the interviewee is an inhabitant, visitor or commuter. At least half of the interviews must be addressed to city inhabitants' distribution between the different types of transport modes has to be obtained. **Calculation method** The result is a survey score $SECsc_{av} = \frac{\sum_i SECsc_i}{i}$ $SECsc_i = \frac{\sum_{j=1}^{m} Q_j * W_j}{\sum_{j=1}^{m} W_j}$ SECscav = Average crime-related security score [%] SECsci = Weighted crime-related security score for surveyed person i [%] i = Number of persons in survey [#] Qj : Score on the quality questions [#] Wj : Score on the importance questions [#] m = Number of topics handled [#]
Where: Scale	Can be available at the city level. However, in the project: consider the intervention level – and potentially discuss the scaling up.
Frequency	Before and after the implementation
Collection methods	interviews, Workshop, Survey, Public and private service data base, public transport operational data
Target	The target population is users and non-users of different transport modes. Only one person per family, per shop, education institution or workplace is to be questioned. It must be clearly marked if the interviewee is an inhabitant, visitor or commuter.
Sources	SUMI 18
Reference	D2.1 Inclusion Plan D2.3 Participatory tool playbook

5.7 Awareness level	
Other	
Awareness level refers to the degree to which individuals or groups are aware of an intervention based on provided information. It can encompass knowledge, understanding, perception, sensitivity or responsiveness and engagement.	
Unit	% of awareness
City relevant	
How: Measure result	Measured through surveys. Specific questions can be tailored by each city to align with local characteristics. However, the results should provide a quantifiable level of awareness, represented as a percentage.
Where: Scale	In the LL area, especially the sites or areas where the applied interventions would have significant impacts. The survey should be addressed to the public (including residents and visitors), operators, public transport customers, etc. It is crucial to highlight the voices of underrepresented social groups.

Frequency	Measurements should be made at least twice during the project, i.e. before the interventions are introduced (baseline) and at the end of the project (ex- post). Where appropriate, data could also be collected annually.
Collection methods	Interviews, Workshop, Survey, Public and private service data base, Public transport operational data
Sources	CIVITAS and ELABORATOR's deliverable 2.1.
Reference	D2.1 Inclusion Plan D2.3 Participatory tool playbook

5.8 Intervention acceptance level	
Other	
Acceptance of the intervention will mean the willingness of citizens to use the new products, services or spaces. The level suggests the proportion of people accepting it out of 100 citizens.	
Unit	% of acceptance
City relevant	
How: Measure result	Measured through surveys. Specific questions can be tailored by each city to align with local characteristics. However, the results should provide a quantifiable level of acceptance, represented as a percentage. In the questionnaires, user acceptance could also address: - Understanding level (% of users with good understanding of the interventions) - Usefulness level (% of users feeling the intervention is useful) - Willingness to change (% of users likely to change mobility behavior)
Where: Scale	In the LL area, especially the sites or areas where the applied interventions would have significant impacts. The survey should be addressed to the public (including residents and visitors), operators, public transport customers, etc. It is crucial to highlight the voices of underrepresented social groups.
Frequency	Measurements should be made at least twice during the project, i.e. before the interventions are introduced (baseline) and at the end of the project (ex- post). Where appropriate, data could also be collected annually.
Collection methods	Interviews, Workshop, Survey, Public and private service data base, Public transport operational data
Sources	CIVITAS and ELABORATOR's deliverable 2.1.
Reference	D2.1 Inclusion Plan D2.3 Participatory tool playbook

5.9 Citizen satisfaction with transport services and operations
Other
The overall quality of transport services encompasses a variety of aspects - comfort, travel time, reliability, safety, privacy, etc. - but travelers usually share a holistic concept of quality, which this indicator seeks to measure. Public transport for instance, is in continuous competition with other transport modes, particularly the private car, and the general perception of the overall PT satisfaction is one of the aspects influencing individual choices.

Unit	% of satisfaction with transport services and operation.
City relevant	
How: Measure result	The rating system for accessibility is a comprehensive way to measure accessibility of services and their operations. Measured as % of shares with a qualitative score (1-5) of the perception of quality. User/provider/stakeholder average report satisfaction with: - The overall quality of the transport system assessed in the intervention (parking, cycling, walking, etc.) - The quality of a specific service. It measures the experience of the user/provider, against its expectations.
Where: Scale	In the LL area, especially the sites or areas where the applied interventions would have significant impacts. The survey should be addressed to the service users. It is crucial to highlight the voices of underrepresented social groups.
Frequency	Measurements should be made at least twice during the project, i.e. before the interventions are introduced (baseline) and at the end of the project (ex- post). Where appropriate, data could also be collected annually.
Collection methods	Interviews, Workshop, Survey, Public and private service data base, Public transport operational data
Sources	CIVITAS and ELABORATOR's deliverable 2.1.
Reference	D2.1 Inclusion Plan D2.3 Participatory tool playbook

5.10 Perception of level of physical ability	
Other	
Perception of service accessibility is the user's perception of the service's physical accessibility. This concerns, for instance, the location of the public transport stops and the convenience of getting there (sense of safety and comfort).	
Unit	On a 5-point scale.
City relevant	
How: Measure result	The rating system for accessibility is a comprehensive way to measure physical accessibility. Measured through surveys. Specific questions can be tailored by each city to align with local characteristics. However, the results should provide a quantifiable level of perception. For a question on how easy it is to reach your nearest public transport service (i.e. in terms of comfort), the following categories can be used: - Very easy - Quite easy - Neither easy nor difficult - Quite difficult - Very difficult - Don't know
Where: Scale	In the LL area, especially the sites or areas where the applied interventions would have significant impacts. The survey should be addressed to the service users. It is

	crucial to highlight the voices of underrepresented social groups to give a good representation of accessibility level in the areas investigated.
Frequency	Measurements should be made at least twice during the project, i.e. before the interventions are introduced (baseline) and at the end of the project (ex- post). Where appropriate, data could also be collected annually.
Collection methods	Rating system for accessibility Interviews, Workshop, Survey, Public and private service data base, Public transport operational data
Sources	CIVITAS and ELABORATOR's deliverable 2.1.
Reference	D2.1 Inclusion Plan D2.3 Participatory tool playbook

5.11 Perception of level of social accessibility	
Other	
Perception of service accessibility is defined as the user's perception of the broader social accessibility of the service. This includes all possible barriers that may be caused by a high dependency on digital tools and information about the service (digital accessibility), the perception that this particular service doesn't meet the needs of a certain social group so that representatives of this group feel excluded (i.e. migrants, children, elderly people, etc.) (social accessibility), as well as the affordability of the service itself (financial accessibility).	
Unit	On a 5-point scale.
City relevant	
How: Measure result	The rating system for accessibility is a comprehensive way to measure social accessibility. Measured through surveys. Specific questions can be tailored by each city to align with local characteristics. However, the results should provide a quantifiable level of perception, represented as a percentage.). It is important to provide different settings for the survey to take place and adapt according to the capacities of each social group (i.e. smaller discussion groups, one to one interview, adapt the question(s) to address children, older people, teenagers etc.).
Where: Scale	In the LL area, especially the sites or areas where the applied interventions would have significant impacts. The survey should be addressed to the service users. It is crucial to highlight the voices of underrepresented social groups. (i.e. age, gender, diverse VRUs) to give a good representation of accessibility level in the areas investigated.
Frequency	Measurements should be made at least twice during the project, i.e. before the interventions are introduced (baseline) and at the end of the project (ex- post). Where appropriate, data could also be collected annually.
Collection methods	Rating system for accessibility Interviews, Workshop, Survey, Public and private service data base, Public transport operational data
Sources	CIVITAS and ELABORATOR's deliverable 2.1.
Reference	D2.1 Inclusion Plan D2.3 Participatory tool playbook

5.12 Quality of cooperation structures with stakeholders	
Other	
Level of quality of cooperation structures between all public and private stakeholders to develop and implement sustainable mobility solutions.	
Unit	On a 5-point scale.
City relevant	
How: Measure result	Measured through feedback surveys. Specific questions can be tailored by each city to align with local characteristics. However, the results should provide a quantifiable quality of cooperation.
Where: Scale	Intervention, city and region, according to the stakeholders' map. Surveys and interviews with decision makers and stakeholders.
Frequency	Measurements should be made at least once during the project.
Collection methods	Interviews, Workshop, Survey
Sources	CIVITAS and ELABORATOR's deliverable 2.1.
Reference	D2.1 Inclusion Plan D2.3 Participatory tool playbook

5.13 Citizen's satisfaction with the mobility and public space infrastructure	
Other	
User/provider/stakeholder average reported satisfaction with the overall quality of the mobility and public space infrastructure (public transport stops, benches, public toilets, water taps etc.). It measures the experience of the user against its expectations.	
Unit	% satisfaction with the mobility and public space infrastructure
City relevant	
How: Measure result	Measured as % of shares with a qualitative score (1-5) of the perception of quality. Measured through surveys. Specific questions can be tailored by each city to align with local characteristics. However, the results should provide a quantifiable citizens satisfaction percentage. A question in either survey should be "How satisfied are you with the quality of the mobility and public space infrastructure in the area of intervention?" and the answer can be given on a five-point scale of "very satisfied" to "very dissatisfied".
Where: Scale	In the LL area, especially the sites or areas where the applied interventions would have significant impacts. The survey should be addressed to the public (including residents and visitors), operators, public transport customers, etc. It is crucial to highlight the voices of underrepresented social groups.
Frequency	Measurements should be made at least twice during the project, i.e. before the interventions are introduced (baseline) and at the end of the project (ex- post). Where appropriate, data could also be collected annually.
Collection methods	Interviews, Workshop, Survey, Public and private service data base, Public transport operational data
Sources	CIVITAS and ELABORATOR's deliverable 2.1.
Reference	D2.1 Inclusion Plan

	D2.3 Participatory tool playbook

Annex II: Manual road user counts

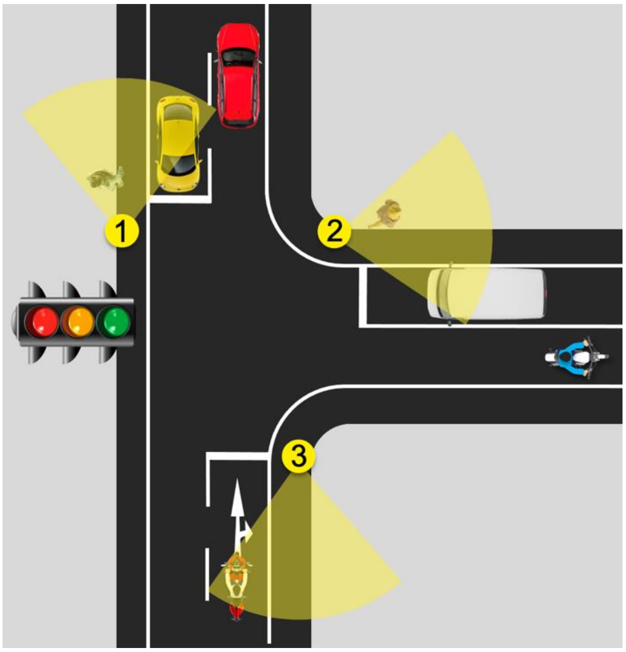
Instruction page

This template is provided to help with counting road users entering the intersection along the main road and from the side road/s. Using this template is optional.

It is recommended that the count is done for 15 to 30 minutes during peak time (the busiest time of the day).

The longer the count is, the more accurate it will be. Counts should not be done for less than 15 minutes. However, they may last up to one hour.

The count should categorize road users into:



- Pedestrians (those walking or using mobility aids, such as wheelchairs), who cross the road and do not cross the road (noted separately on the count sheet)
- Cyclists (including pedal and powered bicycles, tricycles, scooters and other micro mobility with speeds of up to 25km/h),
- Motorcyclists (motorized or powered 2 or 3 wheelers with speeds of over 25km/h),
- Cars, vans, small delivery trucks and minibuses, and
- Large buses and trucks.

For busy or multi-lane intersections, it is recommended placing one person at the entry to each leg of the intersection to count all road users **entering** the intersection (this avoids double counting). For example, on a three-leg intersection, there would be three 'counters' as positioned below.

For mid-block sections of streets or smaller and less busy intersections, this can be done by one or two people covering two or more intersection entries.

Print and use the *Road User Counting Sheet* attached. Each person should have their own counting sheet for the intersection entry/entries they are responsible for counting. For example, if there are three people counting as shown above, there will be three counting sheets completed for one entry each.
The tallies from each sheet can then be used to fill in the Upload Page.

IMPORTANT: NEVER STAND IN A LOCATION WHICH PUTS YOU AT RISK. Please take care of your safety and wear clothing which can be easily seen.

Road user counting sheet

Intersection description (street names, city, country):____

Date and time of count: ____

Duration: ________________________

Street Name:

Pedestrians		**Cyclists**	**E-scooters**	**Motorcyclists**	**Cars, vans etc.**	**Buses, trucks etc.**
Not crossing	**Crossing**					

Street Name:

Pedestrians		***Cyclists***	***E-scooters***	***Motorcyclists***	***Cars, vans etc.***	***Buses, trucks etc.***
Not crossing	***Crossing***					

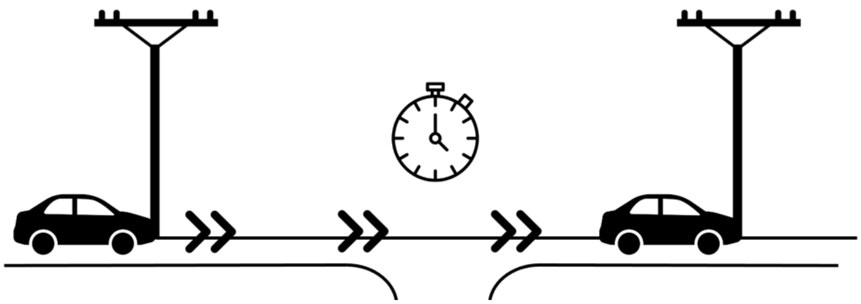
Upload page

Once the counts have been completed, consolidate all information from the counting sheets into this table.

Intersection description (street names, city, country):							
Date and time of count:							
Duration:							
Number of road users	***Pedestrians***		***Cyclists***	***E-scooters***	***Motorcyclists***	***Cars, vans etc.***	***Buses, trucks etc.***
	Not crossing	***Crossing***					
Main road entry 1							
Main road entry 2							
Side road entry 1							
Side road entry 2 (if applicable)							
…							
…							

Annex III: Measuring traffic speed

Measuring the traffic speed can be done using a speedometer. If you don’t have one, the speed of vehicles can be measured by timing how long it takes for cars and motorcycles to travel between two points of a known distance apart.



To do this, pick two locations (such as light poles) along the main road on either side of the intersection. Using Google maps or a measuring device, record how far these two objects are apart. Then, using a stopwatch, record how long it takes for vehicles to travel between one and the other.

It is important to capture speed during both peak and off-peak times. Only record vehicles travelling straight ahead. Do not record speed limited vehicles (such as small motorcycles or mopeds), or vehicles which are turning or stopping at the intersection or pedestrian crossing.

If possible, measure the speed of a sample of vehicles, and then calculate the average. A template is provided for a sample of 80 vehicles, but this can be increased or decreased (min. 20) according to need.

The following example assists with the conversion from seconds into km/h.

IMPORTANT

NEVER STAND IN A LOCATION WHICH PUTS YOU AT RISK. Please take care of your safety and wear clothing which can be easily seen.

Example for converting seconds to km/h based on sample of 10 vehicles:

Distance between objects:	150 meters (m)	
Vehicle	**Time (seconds [sec])**	To calculate speed, divide distance over the average time: *150 m / 8.4 sec = 17.86 m/sec* To convert from m to km, divide by 1000: *17.86 m/sec / 1000 = 0.01786 km/sec* To convert from seconds to minutes, multiply by 60: *0.01786 km/sec x 60 = 1.0716 km/min* To convert to hours, multiply by 60 again: *1.0716 km/min x 60 = 64.3 km/h* Round to the nearest whole number. **The operating speed = 64 km/h**
1	9.1	
2	8.6	
3	7.4	
4	9.0	
5	8.8	
6	9.4	
7	6.8	
8	8.6	
9	8.5	
10	7.8	
Average	**8.4**	

Speed survey template

Distance between objects:	meters (m)	**Time of day**	Peak / Off-peak
Vehicle	**Time (seconds [sec])**	**Vehicle**	**Time (seconds [sec])**
1		41	
2		42	
3		43	

4		44	
5		45	
6		46	
7		47	
8		48	
9		49	
10		50	
11		51	
12		52	
13		53	
14		54	
15		55	
16		56	
17		57	
18		58	
19		59	
20		60	
21		61	
22		62	
23		63	
24		64	
25		65	
26		66	
27		67	
28		68	
29		69	
30		70	
31		71	
32		72	
33		73	
34		74	
35		75	
36		76	
37		77	
38		78	
39		79	
40		80	
		Average	

Annex IV: Data for the environmental impact

The environmental impact evaluation methodology uses 22 indicators (see section 5 for more information regarding data collection), distributed in 10 themes. They consist in a mix of city-wide and site-specific measurements. The table below shows how each indicator is assigned a weight and a normalization strategy to ensure a range between 0 and 1. These details are provided in the following table. If data concerning one indicator is unavailable, weights should be normalized so that they sum up to 1.

Theme	Indicators	Level	Weight	What to collect specifically
Control of environmental impacts	CO emissions	Site-specific	0.061	The indicator is determined by total CO emissions over 8 hours. It equals 1 if CO levels are null and 0 if it is above 10mg/m3. For in-between values, it takes continuous values. The corresponding equation for this relationship is as follows: $\min\left(\frac{10-CO\ levels}{10},1\right)$
	CO2 emissions	City	0.061	The indicator is determined by the average CO2 emissions per inhabitant due to transportation. It equals 1 if the emissions are below 0.5tCO2 and 0 if they are above 4tCO2. For in-between values, it takes continuous values. The corresponding equation for this relationship is as follows: $\min\left(\max\left(\frac{4-CO2\ emissions}{3.5},1\right),0\right)$
	Traffic noise	Site-specific	0.061	The indicator is determined by the average hourly noise level at site level. It equals 1 if noise is lower than 30dB and 0 if it exceeds 90dB. For in-between values, it takes continuous values. The corresponding equation for this relationship is as follows: $\min\left(\max\left(\frac{90-noise\ level}{60},1\right),0\right)$

	Studies of environmental impacts	City	0.061	Indicator equals 1 if the city has carried out studies of environmental impacts, 0 otherwise.
Natural resources	Use of clean energy and alternative fuels	City	0.111	The indicator is determined by the percentage of the car fleet that uses clean energy and alternative fuels.
Bicycle transportation	Cycleways	Site-specific	0.043	The indicator is determined by bicycle infrastructure. It takes values based on the following table: Indicator value – Type of bicycle infrastructure 0 – There is no bicycle cycleway 0.33 – Low Quality: Shared lanes or marked bike routes on streets with traffic, offering minimal safety. 0.66 – Medium Quality: Painted bike lanes on the road that offer some safety but are less protected. 1 – High Quality: Fully separated bike lanes that provide a high level of safety and comfort.
	Bicycle ownership rate	City	0.043	The indicator is determined by the percentage of households owning a bicycle.
	Facilities for bicycle parking	Site-specific	0.043	Indicator equals 1 if the LL includes facilities for bicycle parking, 0 otherwise.
Pedestrians	Pathways for pedestrians	Site-specific	0.071	Indicator equals 1 if the LL includes pathways for pedestrians, 0 otherwise.
	Streets with sidewalks	Site-specific	0.071	Indicator equals 1 if the LL includes streets with sidewalks, 0 otherwise.
Trips reduction	Travel time	City	0.038	The indicator is determined by the average travel time for home - work

<table>
<tr><td></td><td></td><td></td><td></td><td>trips. It takes values based on the following table:
<table><tr><td>Indicator value</td><td>Travel time (mn)</td></tr><tr><td>0</td><td><= 60</td></tr><tr><td>0.33</td><td>30 - < 60</td></tr><tr><td>0.66</td><td>15 - < 30</td></tr><tr><td>1</td><td>< 15</td></tr></table></td></tr>
<tr><td></td><td>Number of trips</td><td>City</td><td>0.038</td><td>The indicator is determined by the average number of trips per inhabitant for one day. It equals 1 if people make less than 2 trips per day and 0 if they make more than 5. For in-between values, it takes continuous values. The corresponding equation for this relationship is as follows:
$\min(\max(\frac{5 - trips\ per\ day}{3},1),0)$</td></tr>
<tr><td></td><td>Measures to reduce motorized traffic</td><td>City</td><td>0.038</td><td>Indicator equals 1 if the city has introduced measures to reduce motorized traffic.</td></tr>
<tr><td>Freedom of movements and circulation</td><td>Congestion</td><td>Site-specific</td><td>0.036</td><td>The indicator is determined by the ratio between the theoretical free flow travel time of the LL and its empirical travel time:
$\frac{free\ flow\ travel\ time}{empirical\ travel\ time}$</td></tr>
<tr><td></td><td>Speed regulations</td><td>Site-specific</td><td>0.036</td><td>Indicator equals 1 if the site includes a speed limit to 30km/h, 0 otherwise.</td></tr>
<tr><td>Private transport</td><td>Motorization rate</td><td>City</td><td>0.039</td><td>The indicator is determined by the number of motorized vehicles per 1000 inhabitants. It takes values based on the following table:
<table><tr><td>Indicator value</td><td>number of motorized vehicles per 1000 inhabitants</td></tr><tr><td>0</td><td>>= 700</td></tr></table></td></tr>
</table>

				0.2 | 600 - < 700 0.4 | 550 - < 600 0.6 | 500 - < 550 0.8 | 400 - <500 1 | < 400
	Vehicle occupation	City	0.039	The indicator is determined by the average number of passengers per vehicle during a trip. It equals 1 if the average vehicule occupation is above 2 people per vehicle and 0 if it is 1. The corresponding equation for this relationship is as follows: $\min(vehicle\ occupation - 1, 1)$
Diversity of transport modes	Motorized versus non-motorized modes	City	0.022	The indicator is determined by the percentage of trips made by ZEM. It equals 1 if the ZEM share is 100% and 0 if it is below 30%. For in-between values, it takes continuous values. The corresponding equation for this relationship is as follows: $\max(\frac{ZEM\ share - 30}{70}, 0)$
Transit integration	Intermodal terminals	Site-specific	0.037	Indicator equals 1 if the site includes an intermodal terminal, 0 otherwise.
Fare policy	Discounts and free rides	City	0.017	Indicator equals 1 if the city offers discounts and free rides, 0 otherwise.
	Transit fares	City	0.017	The indicator is determined by the price (in euros) of a one-way ticket without discounts. It equals 1 if the ticket is free and 0 if it costs more than 4€. For prices in between, it takes continuous values. The corresponding equation for this relationship is as follows: $\min(\frac{ticket\ price}{4}, 1)$

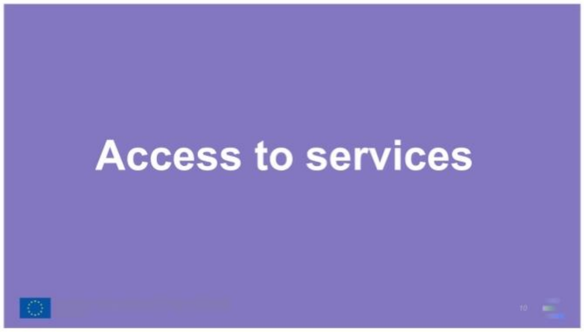
	Public subsidies	City	0.017	Indicator equals 1 if the city offers public subsidies oriented towards mobility, 0 otherwise.

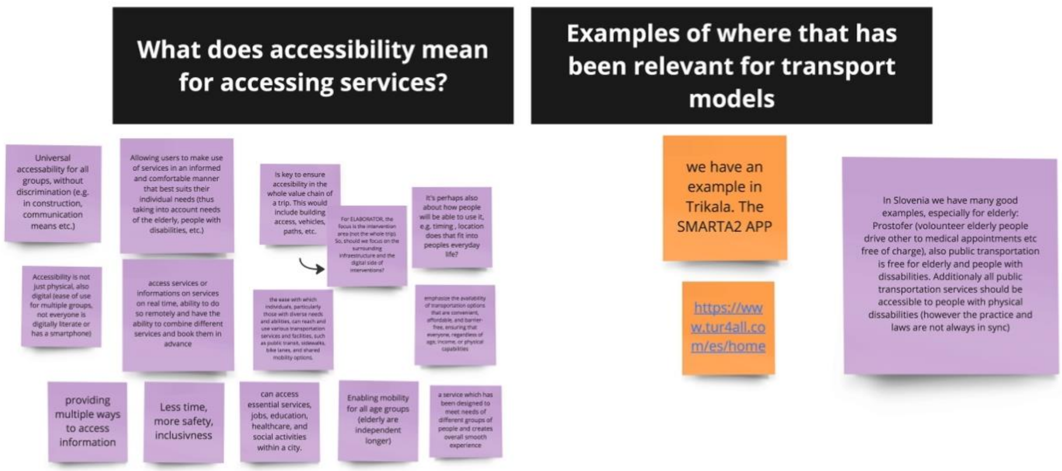
[1] Costa, M. D. S. (2008). An index of sustainable urban mobility. *Unpublished PhD thesis, São Carlos School of Engineering, University of São Paulo at São Carlos, Brazil.*

[2] Silva, A. N. R. D., Costa, M. D. S., & Ramos, R. A. (2010). Development and application of I_SUM: an index of sustainable urban mobility.

[3] de Freitas Miranda, H., & da Silva, A. N. R. (2012). Benchmarking sustainable urban mobility: The case of Curitiba, Brazil. *Transport policy, 21*, 141-151.

Annex V: Accessibility workshop outcomes

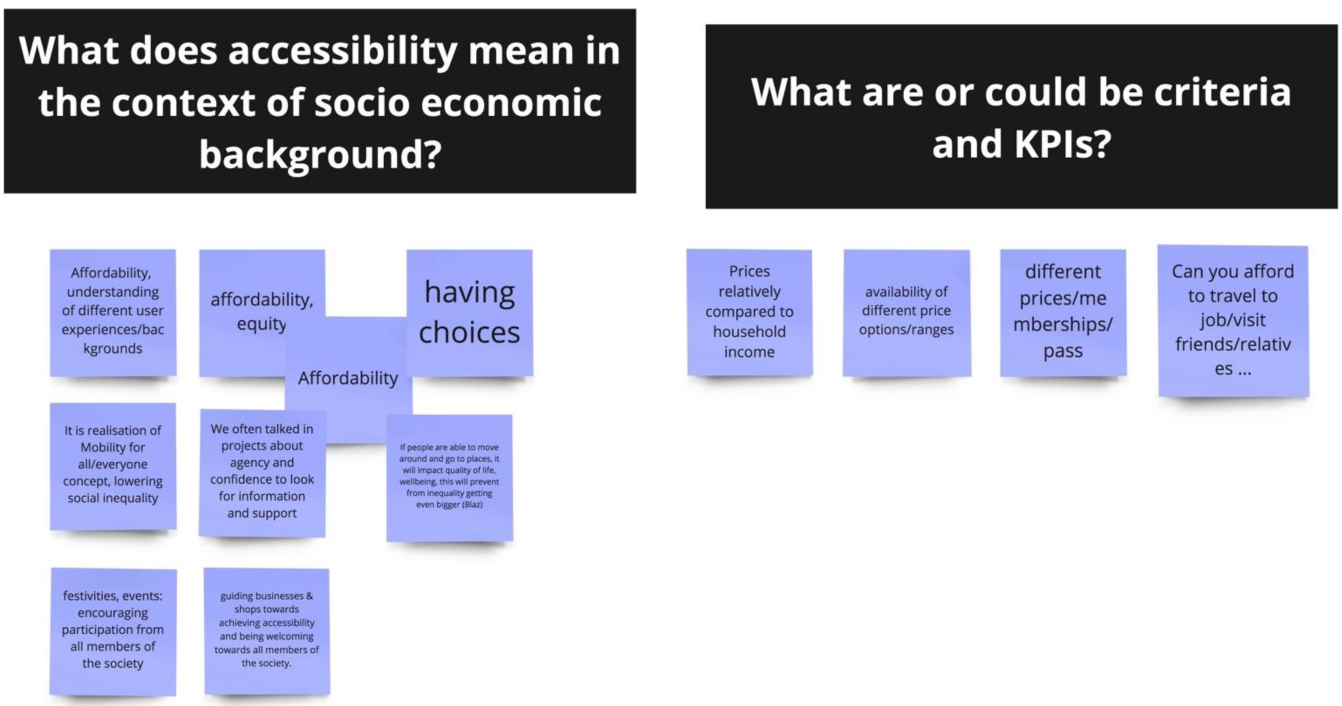




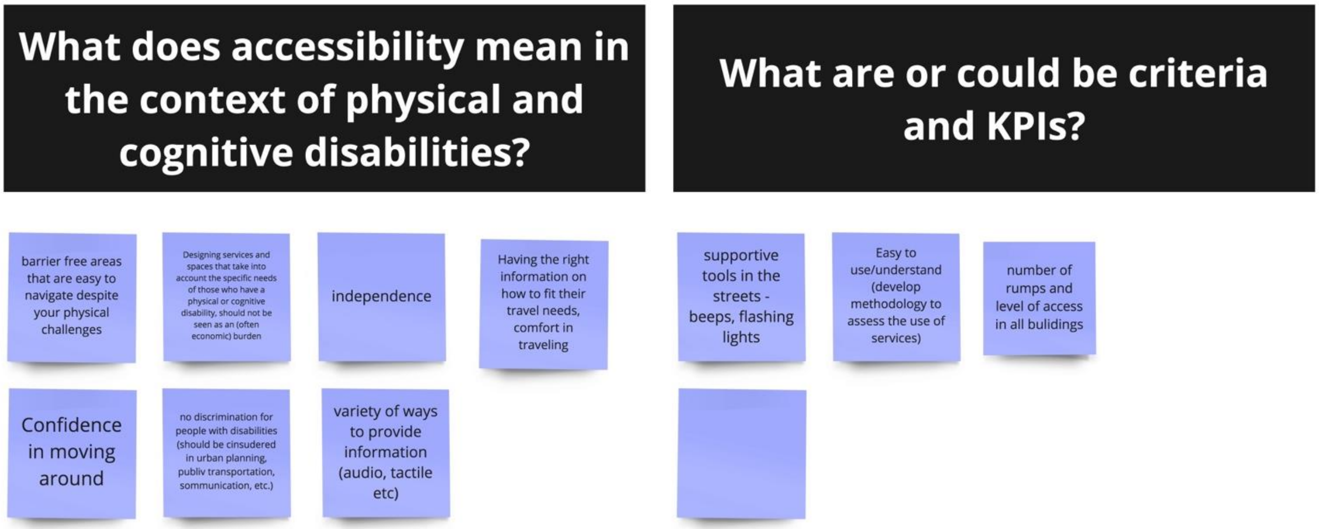

Designing urban spaces


What does accessibility mean for designing urban spaces?
Need of human-centric planning outside offices - with and for citizens (co-creation)
When designing urban spaces, accessibility means creating environments that are inclusive and equitable for all people, regardless of their abilities, needs, or preferences
care activities and mobility of care in the center of the design
creating an inclusive environment where everyone can live, work, socialize, and move around independently and comfortably.
Spaces that are designed with user needs at the forefront
satisfy a wide range of needs and desires
Good practices may not be "copy-pastable" to another city/country ...
to be considered: physical infrastructure, transportation, information, SAFETY, Social inclusion, Economics.
take into consideration all groups of people, designing equitable environments. confort is also an important goal
Is designing ready for future mobility (autonomous vehicles, drones, delivery robots ...)
Part of being confortable/accesible is to include local culture into de design
Urban spaces should follow universal constuction, meaning the public spaces are available for all groups
For Residents AND Visitors
Examples of where that has been relevant for transport models
spatial planning and analyses - geographical and transport situation of indivdual places
Creating sidewalks, bike lanes, pedestrian friendly areas
CableCar projects in Medellín and Bogotá (Colombia)
sufficient crossing time at signals
safe school routes
Ensuring that streets, sidewalks, public buildings, and recreational areas are designed without physical barriers like steps, narrow pathways, or obstacles that could hinder mobility for people with disabilities or those using mobility aids.
A transport system is inaccessible if only people who are able bodied can reach it, even if the transport mode itself is accessible to different users. Space design and transport design must go hand in hand, and planners must think of the entire travel journey of different users
Yes, but we can go beyond to other buildings/facilities used by VRU: pharmacies, hospitals, elderly houses, etc...
What are or could be criteria / KPIs?
Perhaps how safe people will feel in the space
Temperature (for example trees to lower temperature in Summer), lighting (feel safer at night), unobstructed access for different demographic groups and people with different disabilities
Is it safe for children?
Easy orientation
sense of safety/security, accessibility (physical, social), affordability, quality of infrastructure
Is shared space really safer/better for everyone?
Actually compare criteria (written in laws, standards) for accesability with real life conditions (e.g. the availability of parking...)
Physical accessibility: This involves ensuring that urban spaces are barrier-free and easy to navigate for people with different mobility levels, such as wheelchair users, elderly people, pregnant women, or people with strollers.
Informational accessibility: This involves ensuring that urban spaces are informative and communicative for people with different language skills, literacy levels, or cultural backgrounds.
Social accessibility: This involves ensuring that urban spaces are welcoming and respectful for people with different identities, preferences, or lifestyles
Distance from housing and greenspaces - availability of green space for as many people as possible
How can that be measured or rated? Do you know examples as well?
Example in Slovenia: https://dostopnost.javniobjekti.si/izpis/tiskaj?ido=211
economic viability of services along the streets
safety and accidents
Observation of the space: presence of physical barriers, lighting, shading, seating facilities, public toilets presence, see and be seen areas - eye level uses
physical comfort - in terms of noise and pollution levels

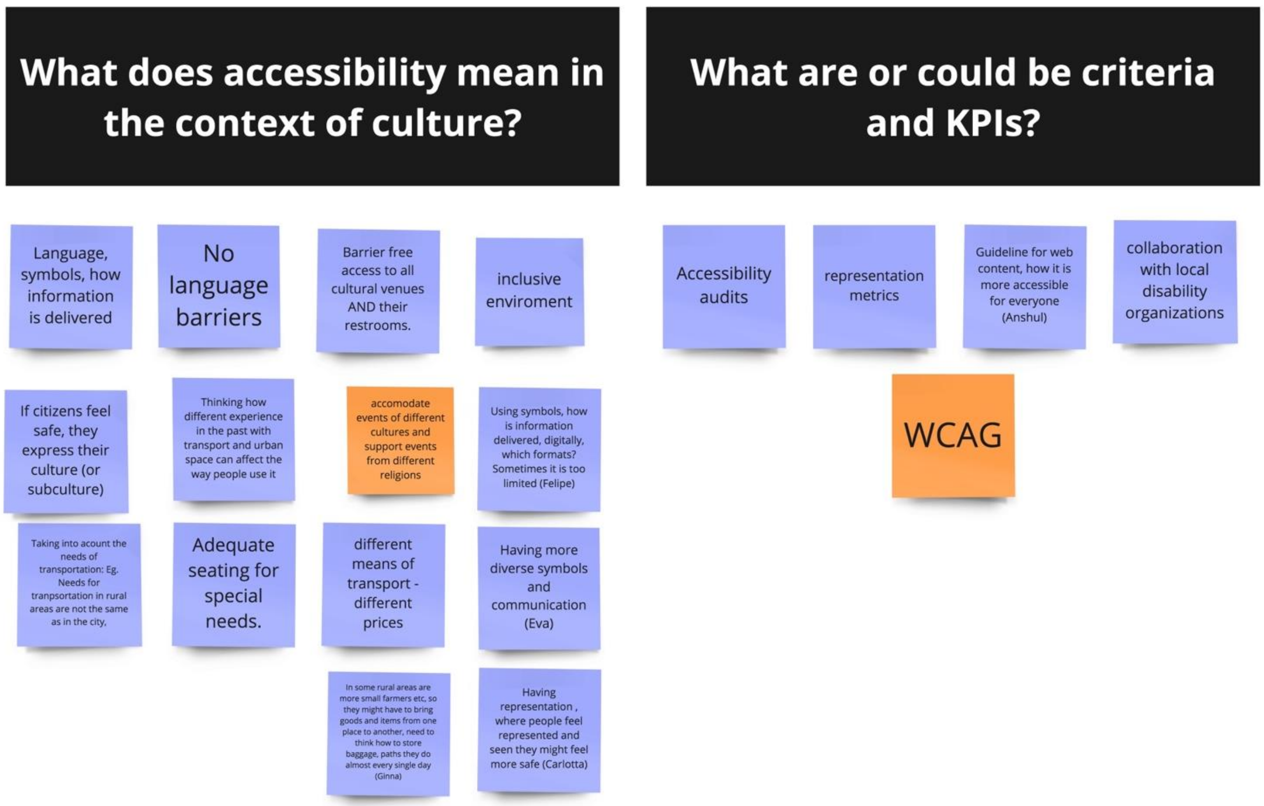

Socio- economic background
14


What does accessibility mean in the context of socio economic background?
Affordability, understanding of different user experiences/backgrounds
affordability, equity
Affordability
having choices
It is realisation of Mobility for all/everyone concept, lowering social inequality
We often talked in projects about agency and confidence to look for information and support
If people are able to move around and go to places, it will impact quality of life, wellbeing, this will prevent from inequality getting even bigger (Blaz)
festivities, events: encouraging participation from all members of the society
guiding businesses & shops towards achieving accessibility and being welcoming towards all members of the society.
What are or could be criteria and KPIs?
Prices relatively compared to household income
availability of different price options/ranges
different prices/memberships/pass
Can you afford to travel to job/visit friends/relatives ...

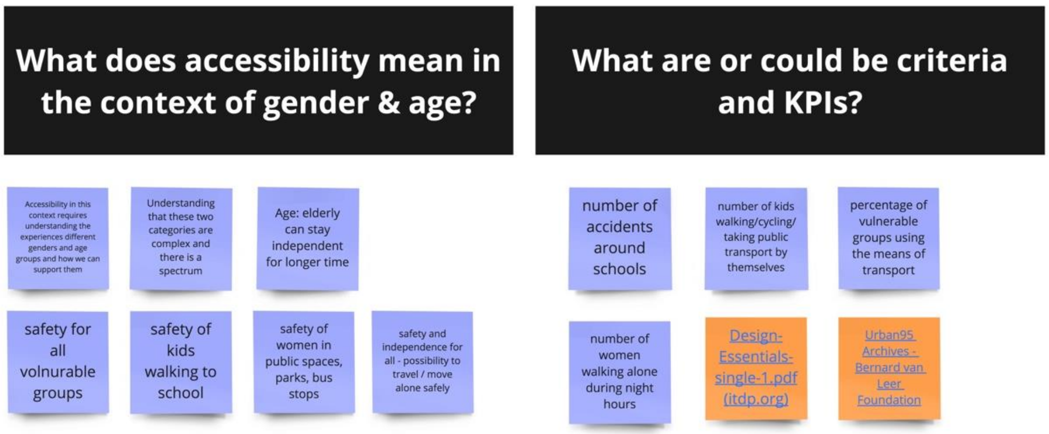

Physical and
cognitive disabilities
15


What does accessibility mean in the context of physical and cognitive disabilities?
barrier free areas that are easy to navigate despite your physical challenges
Designing services and spaces that take into account the specific needs of those who have a physical or cognitive disability, should not be seen as an (often economic) burden
independence
Having the right information on how to fit their travel needs, comfort in traveling
Confidence in moving around
no discrimination for people with disabilities (should be cinsudered in urban planning, publiv transportation, sommunication, etc.)
variety of ways to provide information (audio, tactile etc)
What are or could be criteria and KPIs?
supportive tools in the streets - beeps, flashing lights
Easy to use/understand (develop methodology to assess the use of services)
number of rumps and level of access in all bulidings


Culture
16


What does accessibility mean in the context of culture?
Language, symbols, how information is delivered
No language barriers
Barrier free access to all cultural venues AND their restrooms.
inclusive enviroment
If citizens feel safe, they express their culture (or subculture)
Thinking how different experience in the past with transport and urban space can affect the way people use it
accomodate events of different cultures and support events from different religions
Using symbols, how is information delivered, digitally, which formats? Sometimes it is too limited (Felipe)
Taking into acount the needs of transportation: Eg. Needs for tranpsortation in rural areas are not the same as in the city,
Adequate seating for special needs.
different means of transport - different prices
Having more diverse symbols and communication (Eva)
In some rural areas are more small farmers etc, so they might have to bring goods and items from one place to another, need to think how to store baggage, paths they do almost every single day (Ginna)
Having representation , where people feel represented and seen they might feel more safe (Carlotta)
What are or could be criteria and KPIs?
Accessibility audits
representation metrics
Guideline for web content, how it is more accessible for everyone (Anshul)
collaboration with local disability organizations
WCAG

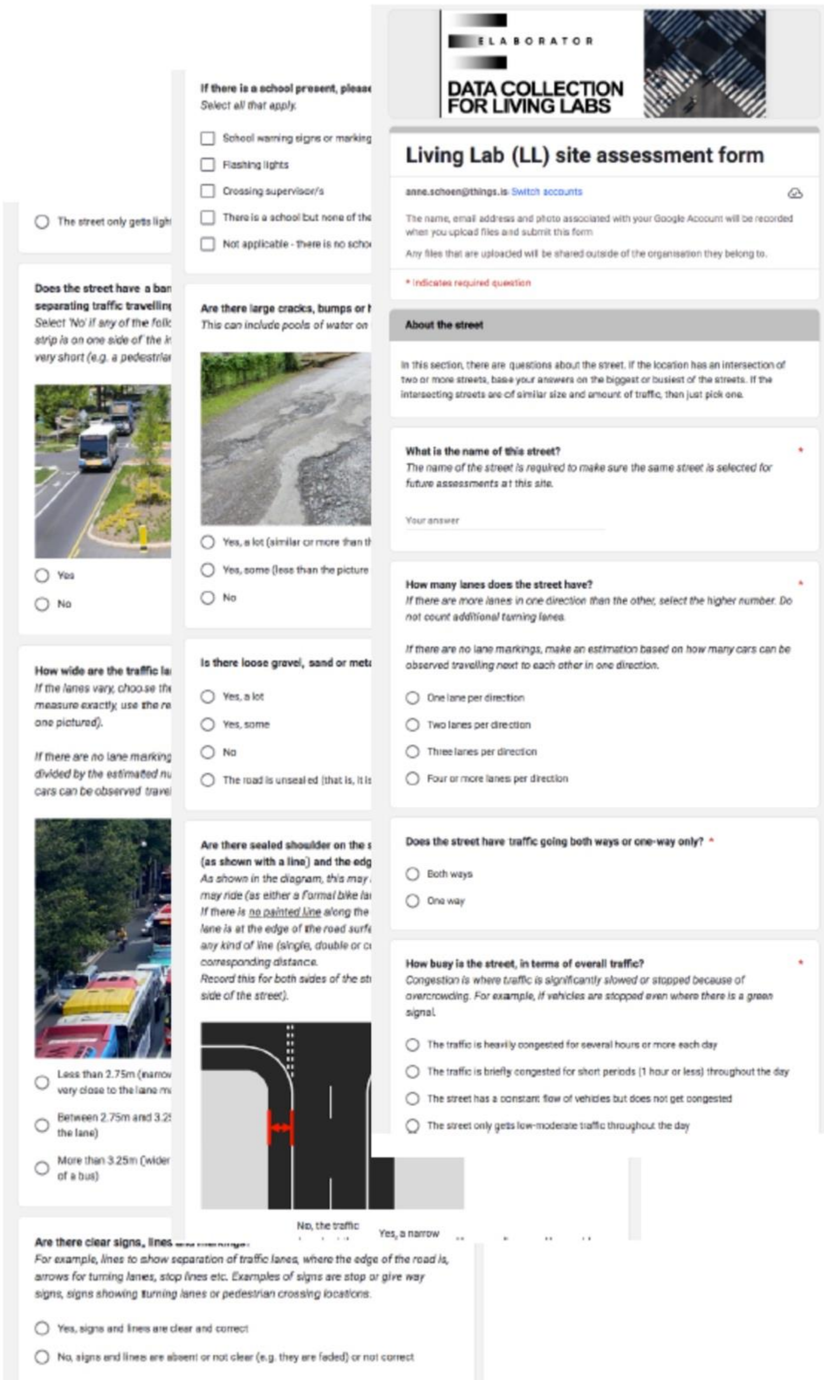

Gender & Age


What does accessibility mean in the context of gender & age?
Accessibility in this context requires understanding the experiences different genders and age groups and how we can support them
Understanding that these two categories are complex and there is a spectrum
Age: elderly can stay independent for longer time
safety for all volnurable groups
safety of kids walking to school
safety of women in public spaces, parks, bus stops
safety and independence for all - possibility to travel / move alone safely
What are or could be criteria and KPIs?
number of accidents around schools
number of kids walking/cycling/ taking public transport by themselves
percentage of vulnerable groups using the means of transport
number of women walking alone during night hours
Design-Essentials-single-1.pdf (itdp.org)
Urban95 Archives - Bernard van Leer Foundation

Annex VI: Safety/Accessibility/Environment Rating System

This online form will guide though a number of categories of questions:

https://docs.google.com/forms/d/e/1FAIpQLSejj1cAtSZ6ScysjG0dXXT4hXSi6pgYmEMItpz2nXvCHldutA/viewform



Annex VII: Evaluation Plan Copenhagen

1. Description of the intervention

WHAT YOU NEED TO DO NOW
Use the template to fill in the description about your intervention. Descriptions for each item in the table are found in Part 2 of the Evaluation Plan Framework.

1. **Template:**

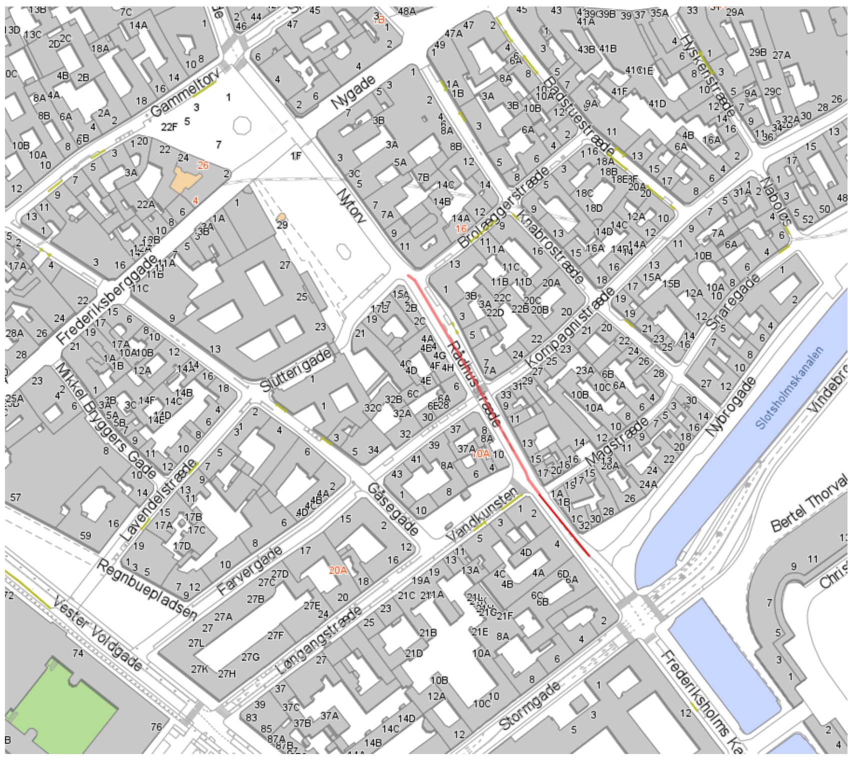
Intervention description	
Overall description	Reduction of Car Parking in Streets
Elements	Today there are approx. 820 regular parking spaces in the streets. Of these, 600 will be relocated. There will then be approx. 220 parking spaces left, which everyone can use. They are especially located on the edge of the medieval city. The current 138 business spaces for cars on yellow plates will be expanded by 12 extras, so that in future there will be 150 business spaces. In the time period 17.00-07.00 and at the weekend, everyone can use these places. The current 68 spaces for visitors with a disabled parking card will be expanded by 7 extras, so that in future there will be 75 spaces. The current 15 disabled places reserved with a number plate will be preserved
Main users	Car users
Boundaries	Medieval City (minus Nørregade kvarter / purple color)
Area and location	Green area

Intervention description	
Overall description	Enhanced bicycle parking
Elements	There will be 1,080 new bicycle racks on the freed-up street areas, including 80 specially designed racks for cargo bikes The historic sites and squares are released for approx. 500 bicycle racks, which will be moved out into the adjacent streets
Main users	Bike users
Boundaries	Main: Medieval City (minus Nørregade kvarter purple color) Sub: The square Vandkunsten and the surrounding streets
Area and location	Main: Green Area

Sub: The square Vandkunsten

Intervention description

Overall description	Vehicle traffic flow adjustments
Elements	Reverse one-way direction of Gåsegade (minor street) • Rådhusstræde (red line) will be unidirectional for cars from Nybrogade to Brolæggerstræde (major street)
Main users	Cyclist and car users
Boundaries	Streets around Rådhusstræde
Area and location	Rådhusstræde's one-direction parts 

2. Evaluation goal

WHAT YOU NEED TO DO NOW

You will need to fill a canvas of your Theory of Change. It is the same one we used for the workshop in Issy. Those are good starting points to complete and tidy up your Theory of Change. Pictures are uploaded on Sharepoint: Pictures from workshop in Issy

1. Download and print another canvas in your office OR use is digitally by downloading it on your computer and using PDF reader to fill the boxes Impact Canvas.pdf
2. Complete all sections, ensure that everything is well connected and there are no "free flowing" items on the canvas
3. Take a picture (Do not upload it for now)
4. Fill the information into the template "Theory of Change". We highly recommend doing this after you have gone through the canvas and prioritised your project goals

Canvas

"Theory of Change", download here : Impact Canvas.pdf

Pictures from Issy Workshop: Pictures from workshop in Issy

Template

Theory of change						
Challenge	• Bullet points					
Solution 1	Short term impact		Medium term impact		Long term impact	
Solution 2	Short term impact		Medium term impact		Long term impact	
Solution 3	Short term impact		Medium term impact		Long term impact	
Vision						

Theory of change			
Challenge	• Climate change / GHG emissions • Poor air quality • Too many cars in motion and parked • Low traffic safety and VRU's sense of unsafety • Low bikeability in narrow streets		
Solution 1	Short term impact	Medium term impact	Long term impact

Reduction of car parking in streets (removal of 600 out of 1100 spots in the Medieval City)	Discourage car use, Improved walkability and bikeability. Possibly increased car traffic around city center	Freed up public space in the streets. Reduced near encounters between cars and VRU's	Reduced car use, Modal shift, Lower air pollution locally, Lower car traffic locally, Enhanced traffic safety for VRUs	Formal and informal urban life in freed public spaces	Lower GHG emissions, Lower car ownership	New uses in freed public spaces. New attractions for citizens and visitors
Solution 2	Short term impact		Medium term impact		Long term impact	
Enhanced bicycle parking (new bike racks in the place of parked cars and removal of bike racks from Vandkunsten square)	More space for bicycles, Improved bikeability	Freed up space in Vandkunsten square. Increased informal urban life in freed spaces	More cycling in the Medieval City	New forms of urban life in freed space	New organized and unorganized uses in freed public spaces, New attractions for citizens and visitors	
Solution 3	Short term impact		Medium term impact		Long term impact	
Vehicle traffic flow adjustments (Rådhusstræde will be unidirectional for cars from Nybrogade to Brolæggerstræde)	Improved traffic flow locally, More space for VRU's, Lower through pass traffic of cars in the Medieval City	Reduced near encounters and perceived unsafety	Enhanced traffic safety for VRUs		Cars are guided towards the periphery of the Medieval City, rather than going through it	
Vision	More space for walking and cycling, more local city life, and more green space in the Medieval City of Copenhagen.					

3. Evaluation indicators

WHAT YOU NEED TO DO NOW
Pick the indicators for your project. For the impact KPIs, looks which ones are relevant for your city and see which element of your intervention is best suited in measuring this data. If there is a mandatory KPI but you don't have

an impact that matched that outcome, you might need to consider adding elements to your solution that will create that impact. And it is always good to talk to the project management about this: Jason (ICCS), Hans (Technical manager), Monica & James (WP7 leaders) 1. Identify indicators and write them next to the impact on your canvas 2. If you have KPIs that are mandatory for your city but no impact to address them, you will need to return to the previous step and add elements to your intervention that will enable you to achieve those outcomes of the KPIs 3. If you are very unsure on how to address this KPIs, please reach out to the project management team with contacts listed above 4. For the SUMIs, make sure to pick at least one per evaluation area 5. Outside of that, pick as many indicators as you think is useful. Keep in mind that you will need to evaluate the impact of your intervention in WP7, so the more indicators and data you collect, the more secure is a successful evaluation in the end 6. Every indicator has a fully detailed description provided in the Annex 7. Feel free to think of other indicators not part of the provided list. Please use the "light blue" template when describing them 8. Once you have decided on the indicators, will the template "Evaluation indicator". Copy past as many templates as you need and fill one template for each indicator, including the KPIs. Make sure to keep the headers colour coded: - dark blue = impact KPIs - light purple = SUMI - light blue = Other indicators 9. Take a second picture of the canvas (including the indicators) and upload it into the indicated area on your City Plan

Templates:

Elaborator Impact KPIs	
Name	**1.3 Addressing a) rebalance of public space to b) achieve desired modal split** The project is aiming for a shift of modal split. This includes cycling, e-scooters, walking, public transport, or shared mobility. The intervention will redesign public space in order to achieve that. To give some examples, this can be a new distribution of space on the roads to allow safer space for cycling, more pedestrian crossings, less parking space to increase pedestrian pathways, more green areas and other infrastructure that will allow people with physical and cognitive mobility challenges to use the public space. Key here is, that it is very clear how your intervention has led to

	changes in the public space, that either motivate, enable, support or ensure people to use different modes of transport which is aimed by the city.
Result of the evaluation	
Unit	% square meters, % change in modal split
Method selected	a) GIS Mappings (incl. parking counts), Rejsekort data (ticket travel card) b) Counting with sensors and cameras
Scale of measurement	The entire Medieval City
Periods for data collection	Before:2023-2024 After:2025
Additional comments	Overlap to SUMI 2.8

Elaborator Impact KPIs	
Name	2.1 Reduction of private car use
Result of the evaluation	
Unit	% change in modal split
Method selected	Survey, traffic counts, sensors and cameras, Rejsekort data (ticket travel card)
Scale of measurement	The entire Medieval City
Periods for data collection	Before:2023/2024 After:2025
Additional comments	Related to SUMI 2.8

Elaborator Impact KPIs	
Name	2.4 5% increase of desired modal split
Result of the evaluation	
Unit	% change in modal split
Method selected	Counting's (Open Traffic Cams, Telraam, Visense), Rejsekort data (ticket travel card)
Scale of measurement	The entire Medieval City
Periods for data collection	Before:2023/2024 After:2025
Additional comments	Overlap to SUMI no 2.8

Elaborator Impact KPIs	
Name	**3.2 Addressing safety risk for cycling and e-scooters** Increasing the use of cycling and e-scooters in the city comes with an increased risk for accidents. This KPIs counts the number of cities directly addressing the safety risks expected to increase due to the intervention.
Result of the evaluation	
Unit	Spatial (location in intersection) and temporal (over the day and the week) probabilities
Method selected	OpenTrafficCam (tracking), in street/web-based observations (of near encounters), Classification of near-encounters based in machine learning
Scale of measurement	Specific intersections
Periods for data collection	Before:2023/2024 After:2025
Additional comments	

Elaborator Impact KPIs	
Name	**3.3 Decrease of safety risks** Cities need to show how their interventions are expected to actively contribute to reducing safety risks. This is more a general indicator, it could be looking at safety for pedestrians, cyclists or VRUs, it's up to the city to define their safety impact.
Result of the evaluation	
Unit	Spatial (location in intersection) and temporal (over the day and the week) probabilities
Method selected	OpenTrafficCam (tracking), in street/web-based observations (of near encounters), Classification of near-encounters based in machine learning
Scale of measurement	Specific intersections
Periods for data collection	Before:2023/2024 After:2025
Additional comments	

Elaborator Impact KPIs	
Name	**4.1 Increase of Zero Emission modes** Use of transport should increase amongst the modes of transport that reduce the air pollution in the LL. This can be for example cycling, walking, e-scooter, public transport etc. Here it will be not necessary to measure the reduction in air pollution, but the increase of use for services that contribute
Result of the evaluation	
Unit	%
Method selected	Traffic counts (Telraam, manual counts, OpenTrafficCam),
Scale of measurement	Medieval City
Periods for data collection	Before:2024 After:2025
Additional comments	Min 5% increase All LL

Elaborator Impact KPIs	
Name	**4.2 Reduction of emissions** Carbon dioxide emission reductions from the use of energy could be achieved by fuel conversion, increased efficiency, reducing energy demand and increased use of non-fossil energy sources. There needs to be an estimated 10% reduction of emission in LLs. It will need to be estimated as it will likely not be possible for cities to achieve that aim using this test bed of the LL. What needs to be evident is a development through the intervention that, at scale, will lead to the targeted reduction of emissions. This can be defined by observing the shift of modes of transport that will reduce air pollution at scale, by people’s satisfaction with the changes of the intervention.
Result of the evaluation	
Unit	%
Method selected	Need to choose between modal split and measuring emission directly by ELABORATOR toolkit - if it will be ready in time?
Scale of measurement	Medieval City
Periods for data collection	Before:2024 After:2025

Additional comments	Choose between measure use of mobility / comparing modal split before and after or measuring emission directly Min of estimated 10% decrease

Elaborator Impact KPIs	
Name	**4.5 Reduction in exposure to air and noise pollution** The scaling of the solutions is expected to reduce the road user's exposure to air and noise pollution by 10% min. What is important to show a clear link between the intervention and the aimed outcomes. It will be unlikely possible for cities to show data of the achieved aim, but measured data of the test results should point into that direction.
Result of the evaluation	
Unit	Number
Method selected	Sensors (have to look into what sensors for noise and air pollution the City of Copenhagen has) Reduction in traffic as an indicator for better air quality and less noise? (Traffic Counts)
Scale of measurement	Medieval City
Periods for data collection	Before:2024 After:2025
Additional comments	*Obs it is nr. 4.5 on page 16 and nr 4.6 in the annex* 10% reduction All LL

Elaborator Impact KPIs	
Name	**4.6 Increase of quality-adjusted life years** This impact is expected to be generated by an uptake of active transport modes. That shift will increase the air quality and therefore improve the overall health of citizens. This is a long term impact and will be difficult to measure in such a short time frame and limited scale of the LLs. What will be important is to look at the intention's cities aim for to increase the use of active modes of transport which will then reduce air pollution.

Result of the evaluation	
Unit	%
Method selected	**(do not know how CPH LL can measure....) Suggestions from the Annex:** **Measure uptake** in active and zero emission mobility modes. Please refer to impact KPI 6.2 "Increase of desired modal split" for more information on how to measure this. **To measure improved air quality** and health outcomes long term (after ELABORATOR is finished) it is also possible to collect data on emissions and air pollutants. For that, cities can use sensors to collect information about the emissions in the air. Furthermore, they can sue counting sensors to check a long-term development of decreasing air polluting modes of transport.
Scale of measurement	
Periods for data collection	
Additional comments	Note: it is nr. 4.6 on page 16 and nr 4.5 in the annex All LL (no specific target)

Elaborator Impact KPIs	
Name	5.1 Toolkits adopted and deployed
Result of the evaluation	
Unit	Number of toolkits adopted and deployed
Method selected	1) Explain purpose of selected toolkit, 2) Show evidence of usage of toolkit, 3) Show results and usage as tool for active participation, data platform, and visualization
Scale of measurement	Intervention scale
Periods for data collection	During the project
Additional comments	At least 1 toolkit deployed

Elaborator Impact KPIs	
Name	5.2 Focus group consultation

Result of the evaluation	
Unit	Number of focus groups (approx. 5)
Method selected	Semi-structured interviews with VRUs or representative, Workshops with VRUs and stakeholders.
Scale of measurement	City of Copenhagen? Medieval city (green area)/ Intervention scale
Periods for data collection	During 2025 - immediately after implementation of intervention (short term impacts), During 2026 - medium term impacts
Additional comments	Data before interventions on focus group's mobility needs etc. draws on existing surveys, explorations and evaluations. Hence, no direct consultancy activities will be needed.

SUM indicator	
Name	1.4 Congestion and delays
Result of the evaluation	
Unit	%
Method selected	Method used by Copenhagen Municipality, Travel Time Sensors (InRix data)
Scale of measurement	Roads around the Medieval City
Periods for data collection	Before (2024) and after (2025)
Additional comments	

SUM indicator	
Name	1.5 Opportunity for active mobility
Result of the evaluation	
Unit	% (share of road length adapted for walking)
Method selected	Car parking counts in the streets before and after the intervention / The length of the road network adapted to walking is calculated from the length of pavements plus the length of pedestrian zones, as a share of the total road network
Scale of measurement	Intervention area (Medieval City of Copenhagen)
Periods for data collection	Before (2024) and after (2025) the intervention
Additional comments	

SUM indicator	
Name	**1.7 Quality of public spaces** Quality of public area, presence in the city of streets and squares that offer sociability and a good image.
Result of the evaluation	
Unit	0-10 satisfaction scale & Qualitative insights from focus groups
Method selected	Survey (car users), Stop interviews (soft mobility user groups), Workshops/Focus group (VRUs, stakeholders,
Scale of measurement	"How satisfied are you with the quality of public spaces in the Medieval City?" Selected squares and intersections
Periods for data collection	After the interventions – short term impacts (2025), medium term impacts (2026)
Additional comments	Data before interventions on VRU's and other stakeholders' satisfaction levels draws on existing surveys, explorations and evaluations. Overlap to 5.7

SUM indicator	
Name	**2.8 Modal split**
Result of the evaluation	
Unit	%
Method selected	Traffic counts, Counting sensors and Opentrafficcam
Scale of measurement	Interventions area (Medieval City of Copenhagen)
Periods for data collection	Before (2023-2024) and after (2025-2027) the interventions
Additional comments	

SUM indicator	
Name	**4.10 Air pollutant emissions**
Result of the evaluation	Pollutants emitted by transport activities contribute to ambient air pollution and put significant pressures on the environment and human health. Significant policy

	efforts, although with differences across modes, have addressed transport-related air pollution in recent decades and have led to some improvements. The indicator measures the air pollutant emissions of all passenger and freight transport modes in the urban area. Emissions from the transport sector are regulated by vehicle emissions standards and fuel quality requirements.
Unit	Emission harm equivalent index [kg PM2.5 eq./cap per year]
Method selected	Traffic counts from TU data on total vehicle km (and trip behavior). City database if existing.
Scale of measurement	City of Copenhagen – what is the hypothesis? (not measurable at intervention site level but consider the intervention level – and potentially discuss the scaling up).
Periods for data collection	Before (2023-2024) and after (2025-2026) the interventions
Additional comments	Consider the availability and relevant location of the city's air pollution sensors

Another indicator	
Name	**5.7 Intervention acceptance level** Acceptance of the intervention will mean the willingness of citizens to use the new products, services or spaces. The level suggests that we are looking at the proportion of people accepting it out of 100 citizens.
Result of the evaluation	
Unit	% of acceptance
Method selected	Survey (car users), Stop interviews (soft mobility user groups), supplied by qualitative data from Semi-structured interviews and Workshops/Focus group (VRUs, stakeholders)
Scale of measurement	- Level of acceptance (% of users accept the interventions) - Understanding level (% of users with good understanding of the interventions)

	- Usefulness level (% of users feeling the intervention is useful) - Willingness to change (% of users likely to change mobility behavior)
Periods for data collection	Survey - Before (2023-2024) and after (2025-2027) the interventions Qualitative methods – only after interventions
Additional comments	Levels of acceptance and usefulness among car users and public space users will be investigated quantitatively. Targeted user groups (VRUs and stakeholders) will be explored qualitatively, producing non-quantifiable inputs and feedback (which groups will be specified later). Overlap to SUMI 1.7

4. Data collection methods

WHAT YOU NEED TO DO NOW
For each indicator, choose the appropriate methods to collect data. Often, it is good to have both qualitative and quantitative data for an indicator so that you can get a more accurate picture. Below we provide a list of suggested qualitative and quantitative data collection methodologies. Each of them has guidelines attached. These guidelines should help collect data the right way to be used for evaluation purposes. Feel free to also choose others, these here are just suggestions. It might still be useful to look at the guidelines for our suggested methodologies, as they might be applicable for your own methodologies, too. 1. Select methodologies making sure every indicator has a method allocated. It is possible to use the same method, or the data collected for multiple indicators 2. Fill in the template "Data collection methodologies". Copy and paste as many as you need to fill one template for each methodology

Template:

Quantitative

Data collection methodology	
Name of the methodology	5. Survey
Type of data collected	Travel behavior of car users that park in the streets of the Medieval City of Copenhagen, before and after the intervention

Evaluation indicators addressed	2.1 Reduction of private car use 5.7 Intervention acceptance level (to be decided)
Resources and equipment needed	
Timeline for data collection	Before intervention, 2024 and short-term impacts of intervention 2025-2026.

Data collection methodology	
Name of the methodology	6.Road data from device (what is the difference from nr. 11 Traffic Count.)
Type of data collected	
Evaluation indicators addressed	
Resources and equipment needed	
Timeline for data collection	
Data collection methodology	
Name of the methodology	9 Floating Car Data
Type of data collected	InRix
Evaluation indicators addressed	Congestion
Resources and equipment needed	Time
Timeline for data collection	Before: 2023-2024 after: 2025
Data collection methodology	
Name of the methodology	10 parking counts
Type of data collected	Data from parking houses
Evaluation indicators addressed	
Resources and equipment needed	Time
Timeline for data collection	Before: 2024 after: 2025
Data collection methodology	

Name of the methodology	11 Traffic Counts
Type of data collected	Number of vehicles, bikes, pedestrians
Evaluation indicators addressed	
Resources and equipment needed	Telraam, manual counts, OpenTrafficCam, ViSense cameras
Timeline for data collection	

Data collection methodology	
Name of the methodology	15 CO2 sensors
Type of data collected	Have to look into if we have that in CPH
Evaluation indicators addressed	
Resources and equipment needed	
Timeline for data collection	

Data collection methodology	
Name of the methodology	16. Public transport operational data (Note: in annex p. 29 it is understood as floating data from the position of the busses etc.)
Type of data collected	Numbers of passengers checking in and out
Evaluation indicators addressed	
Resources and equipment needed	Data from 'Rejsekortet' (ticket travel card)
Timeline for data collection	Before: 2024 after 2025

Data collection methodology	
Name of the methodology	SoMe
Type of data collected	SoMe data
Evaluation indicators addressed	Posts from SoMe platforms associated with a given location/hashtag
Resources and equipment needed	Data from selected social media platform
Timeline for data collection	Before summer 2024 after 2025

Qualitative

Data collection methodology	
Name of the methodology	2. 1. Structured interviews
Type of data collected	Stop interviews conducted in streets and public spaces. Quantifiable data measuring levels of acceptance, accessibility, security and satisfaction
Evaluation indicators addressed	1.3, 1.7, 5.7
Resources and equipment needed	Interview guide, I-pads or the like, analytical software.
Timeline for data collection	6-12 months after interventions, i.e. during 2025 – short term impacts, 2 years after interventions, i.e. during 2027 - medium term impacts.

Data collection methodology	
Name of the methodology	2.3 Semi-structured interviews
Type of data collected	Qualitative interview data on perceptions of acceptance, accessibility, security and

	satisfaction, focusing on identifying changes before and after interventions for specific VRUs. 1-3 person interviews with representatives.
Evaluation indicators addressed	1.3, 1.7, 5.7
Resources and equipment needed	Meeting rooms, interview guide, audio recording equipment, analytical software.
Timeline for data collection	6-12 months after interventions, i.e. May-Oct 2025

Data collection methodology	
Name of the methodology	3. Workshops (focus groups)
Type of data collected	Qualitative – co-interpretations of impact of changed urban life patterns, recorded conversations and discussions, textual transcriptions
Evaluation indicators addressed	1.3, 1.7, 5.7
Resources and equipment needed	Meeting rooms, various low-tech equipment, maybe a range of high-tech analytical outcomes ("data pictures") on changed patterns in urban life of Medieval City
Timeline for data collection	6-12 months after interventions, i.e. May-Oct 2025

Annex VIII: Evaluation Plan Helsinki

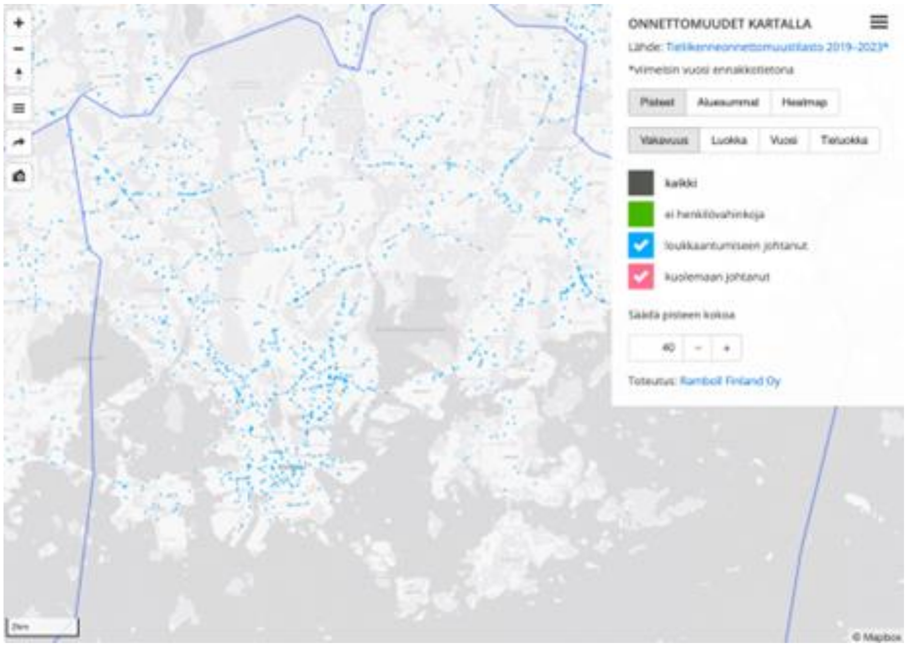
1. Description of the intervention

WHAT YOU NEED TO DO NOW

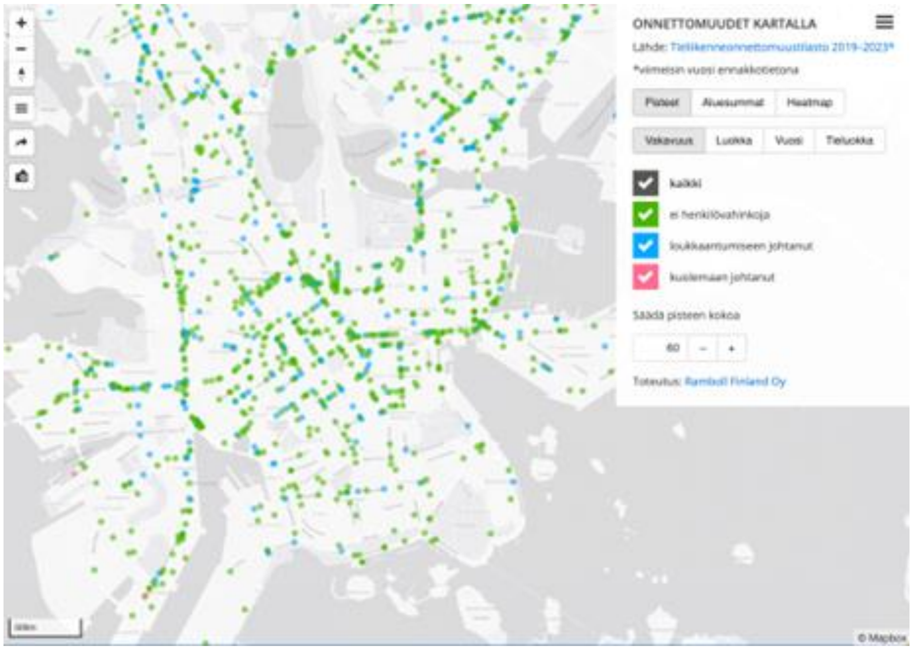
Use the template to fill in the description about your intervention. Descriptions for each item in the table are found in Part 2 of the Evaluation Plan Framework.

Intervention description	
Overall description	**Intervention 1: Testing new solutions for collecting, visualizing and analyzing accident-related information** Improving traffic safety in the city requires knowledge of the risks associated with traffic. In addition to accident analysis, the feeling of insecurity, near misses and risk situations that are not covered by accident statistics should be taken into account. In the Helsinki Living Lab, we are responding to this by testing new technology, new ways of data collection and visualization. The project pays special attention to accidents involving shared-use bicycles and electric scooters.
Elements	**Citizen survey** Extensive map-based traffic safety survey for citizens of Helsinki. The survey will be done in September 2024 and in cooperation with the City of Helsinki. **Proof of concept** Aim is to test a new technological solution for collecting data, that typically remains outside official statistics. The solution will be purchased as an external service. The solution can be e.g. platform based or safety tech case study.
Main users	Traffic planners / urban planners (City of Helsinki, Urban Environment Division) / City officials Support the City of Helsinki planning traffic safety measures and instructions issued to light electric vehicle service providers. E-scooter operators E-scooter riders VRUs (pedestrians, cyclists, people with mobility impairments) Technology providers
Boundaries	Citizen survey: City of Helsinki Proof of concept: City of Helsinki / city centre
Area and location	Traffic accidents 2019-2023 https://mobilityanalytics.ramboll.com/onn/poliisi/

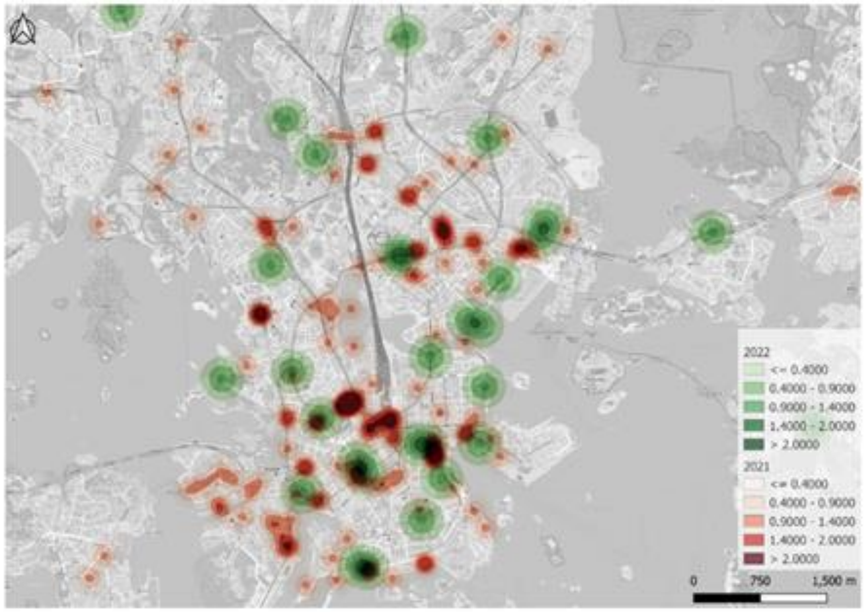
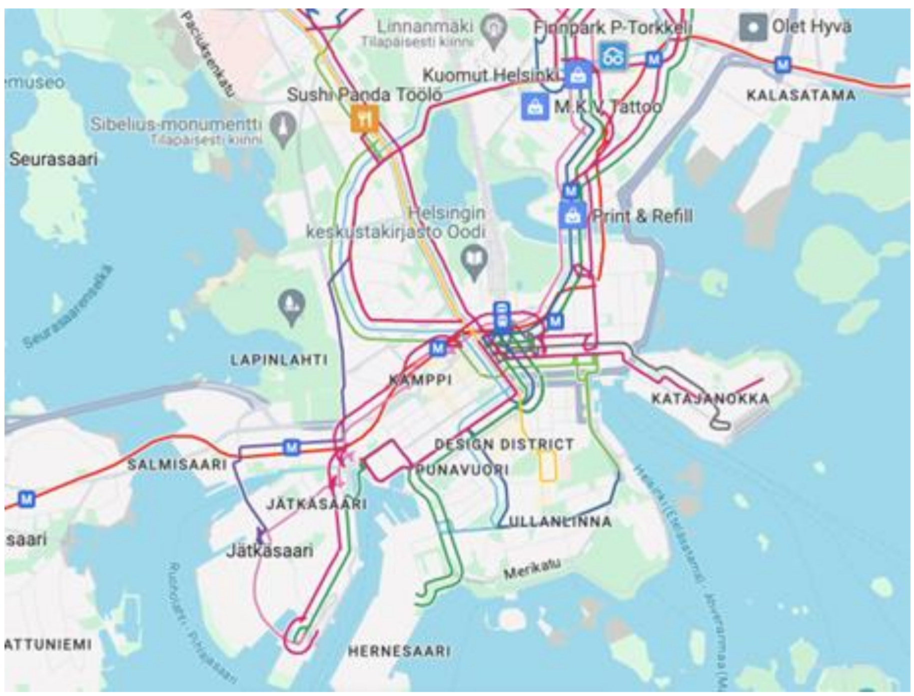
City of Helsinki



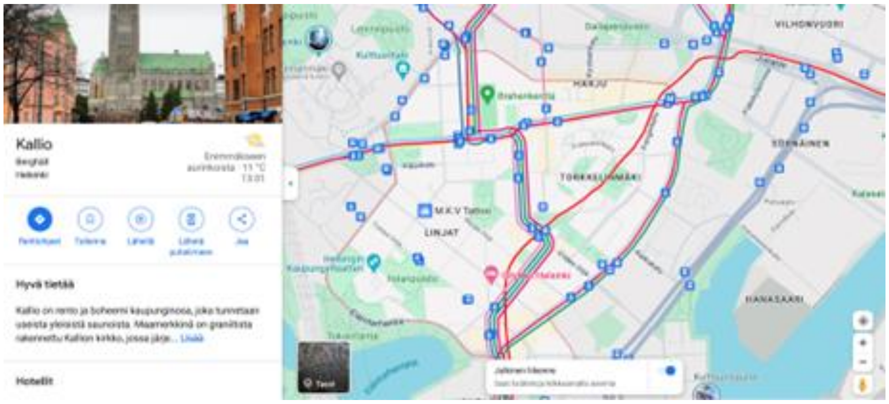
City centre

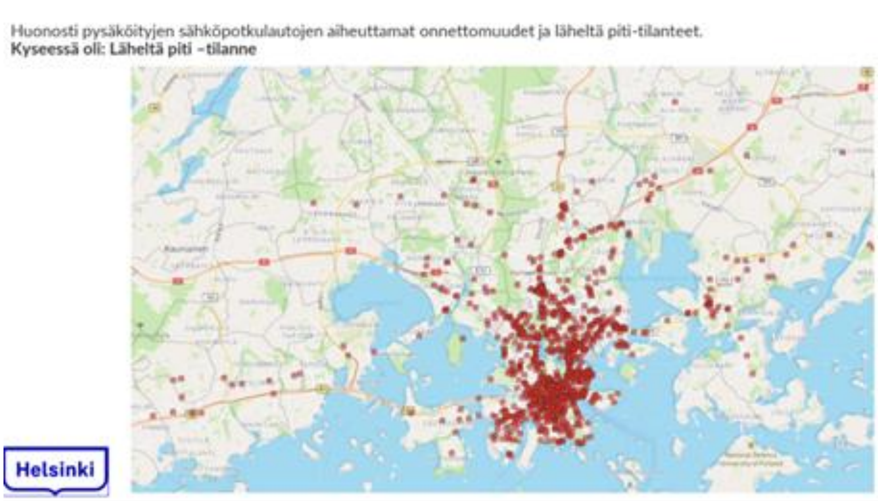


E-scooter releated traffic accidents 2021-2022 (source)

	 *Figure 53: Focused heatmap of e-scooter crashes arrived by ambulance for Jan-Aug in 2021 and 2022, non-weighted* Google maps (city centre with public transport): 

Intervention description

Overall description	**Intervention 2: Optimizing parking locations for shared e-scooters** The operation of e-scooters has undergone changes in recent years and will continue to do so. In 2022 there were around 18 000 e-scooters in the city centre and this was too much. In 2023, the city of Helsinki decided to restrict the parking of shared-use e-scooters in the city centre and in 2024, the restricted area widens.
Elements	**Background study in eastern city centre** Background study on parking of e-scooters done through observation, videoing and interviews. **E-scooter parking - testing new geofencing solution** Optimizing parking locations for shared e-scooters, testing new technologies. The solution will be purchased as an external service.
Main users	Traffic planners / urban planners (City of Helsinki, Urban Environment Department) – Support the City of Helsinki planning traffic safety measures and instructions issued to light electric vehicle service providers. E-scooter operators E-scooter riders Cyclists Pedestrians People with mobility impairments
Boundaries	Intervention 2 is focused on a new parking restriction area in the eastern city centre (Kallio district)
Area and location	Kallio district (Google maps with public transport on a map)  E-scooter parking restriction area in 2023:

	 Accidents and near misses caused by badly parked electric trolleys. (near-misses on a map), 2023 (City of Helsinki) 

Intervention description	
Overall description	**Intervention 3: Improving safety at intersections**

	One of the priorities of the Helsinki Traffic Safety Programme 2022-2026 is to improve the safety of junctions and intersections. The majority of road accidents involving pedestrians, cyclists or children, happen at junctions and intersections. Jokeri Light Rail started to operate in October 2023. It was built between Itäkeskus in Helsinki and Keilaniemi in Espoo (source).  The recently opened Jokeri light rail line, in neighborhoods which did not have a tramline before, has raised safety concerns among VRUs. Especially at light rail crossings in which the light rail has the right-of-way. New kind of crossing points have appeared along the light rail line route. The crossing points differ from regular pedestrian crossings. Pedestrians and cyclists must always give way to approaching light rail vehicles.
Elements	**Baseline data collection on selected intersections / pedestrian crossing point** VTT will conduct conflict study and this requires baseline camera-based data collection. FVH will conduct other data collection (e.g. Lidar). Helsinki Living Lab will utilize AI and digital twins to improve traffic safety. **Real-time warning system** (for one intersection / pedestrian crossings in Viikki district) Leasing of equipment for VRU tracking and conflict detection (at least 6 months). **Data collection for the evaluation of intersections** Deploying innovative online applications, AI, Digital Twins using Lidar, 3D models for the evaluation of intersections.
Main users	Traffic planners / urban planners (City of Helsinki, Urban Environment Department) Mobility Lab Helsinki (Lidar-based data) Citizens of Viikki district, students in nearby campus Pedestrians

	Cyclists
Boundaries	Spatial boundaries: Pedestrian crossing point along the light rail line route in Viikki (Viikintie-Koetilantie) The modes affected: Light rail, pedestrians, cyclists
Area and location	Viikki (Google maps):  Viikki & selected pedestrian crossing point (FVH): 

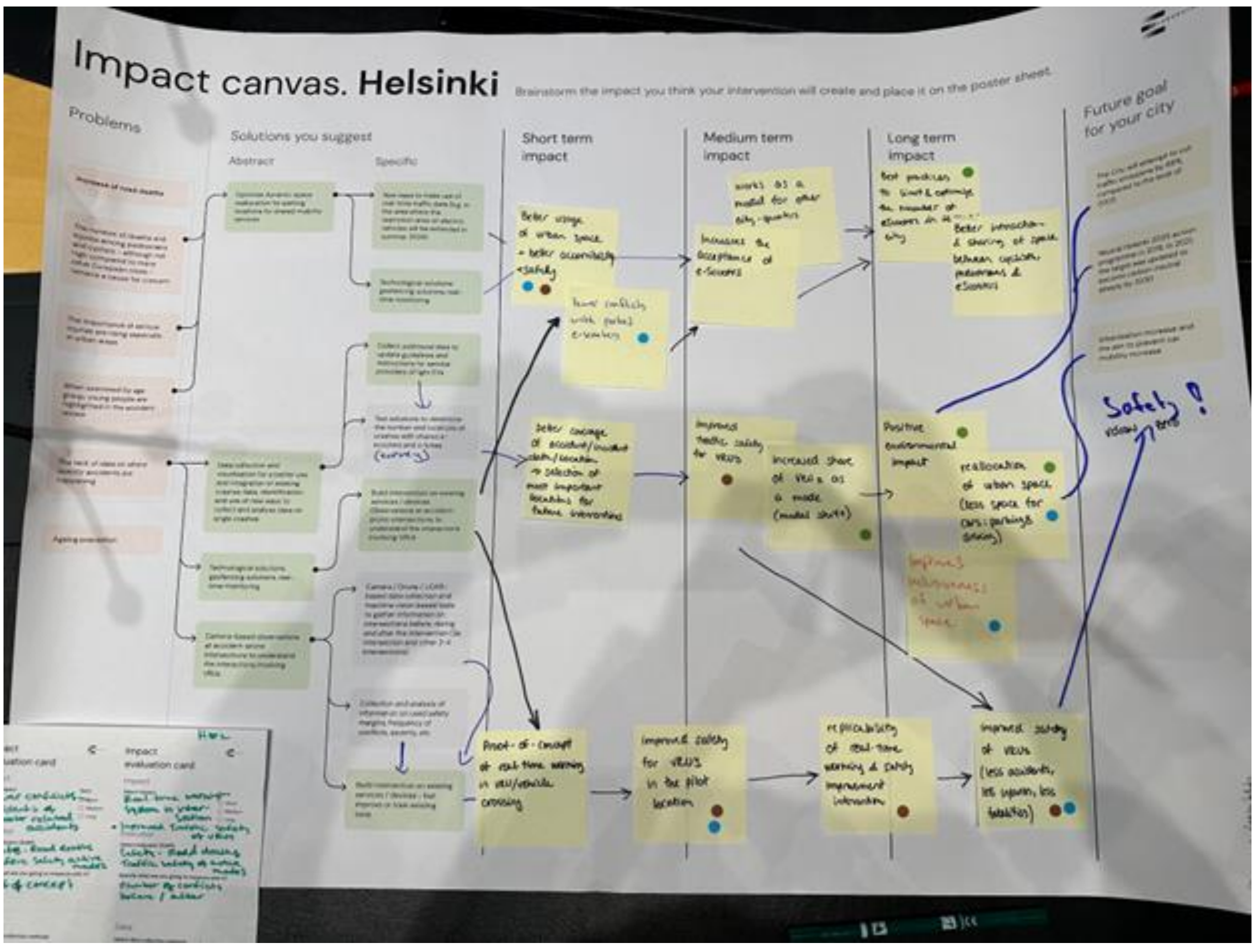
2. Evaluation goal

WHAT YOU NEED TO DO NOW

You will need to fill a canvas of your Theory of Change. It is the same one we used for the workshop in Issy. Those are good starting points to complete and tidy up your Theory of Change. Pictures are uploaded on Sharepoint: Pictures from workshop in Issy

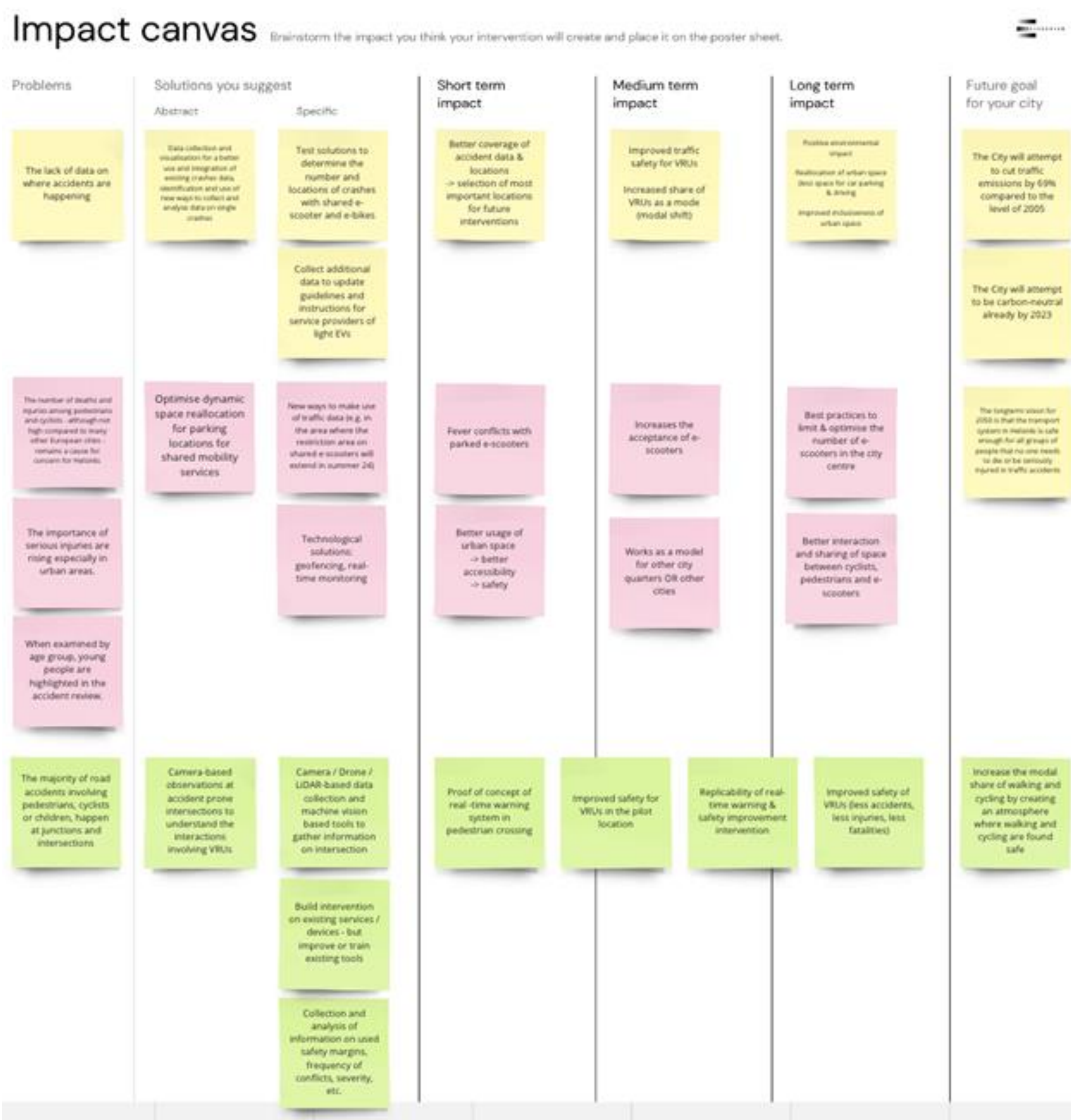
1. Download and print another canvas in your office OR use is digitally by downloading it on your computer and using PDF reader to fill the boxes Impact Canvas.pdf
2. Complete all sections, ensure that everything is well connected and there are no "free flowing" items on the canvas
3. Take a picture (Do not upload it for now)
4. Fill the information into the template "Theory of Change". We highly recommend doing this after you have gone through the canvas and prioritised your project goals

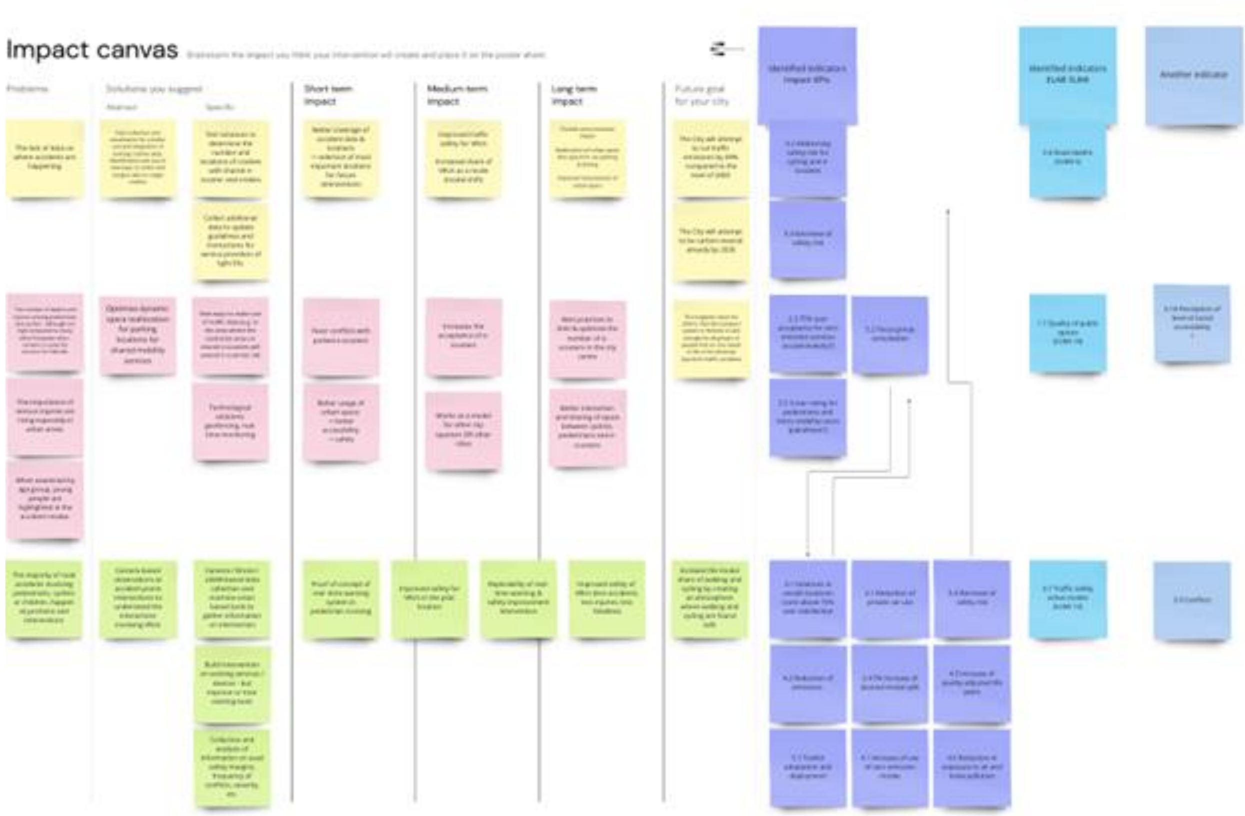
Pictures from Issy Workshop: Pictures from workshop in Issy



Canvas

"Theory of Change", download here : Impact Canvas.pdf





Theory of change			
Intervention 1: Testing new solutions for collecting, visualizing and analyzing accident-related information			
Challenge	● The lack of data on where accidents are happening or which are accident and conflict-related, and perceived as dangerous		
Solution 1	**Short term impact**	**Medium term impact**	**Long term impact**
Test solutions to determine the number and locations of crashes with shared e-scooter and e-bikes	In the short term, better knowledge of accident-prone locations will allow interventions to be targeted at those accident-prone areas.	In the medium term, better knowledge increases traffic safety and will increase the safety of VRUs.	In long term, inclusiveness of urban space increases
Intervention 2: Optimizing parking locations for shared e-scooters			

<table>
<tr><td>Challenge</td><td colspan="3">The number of deaths and injuries among pedestrians and cyclists - although not high compared to many other European cities - remains a cause for concern for Helsinki.
Improper e-scooter parking tendencies represents a safety hazard (e.g. tripping and falling due to knocked over e-scooters on pavement)
The importance of serious injuries are rising especially in urban areas.
When examined by age group, young people are highlighted in the accident review.</td></tr>
<tr><td>Solution 2</td><td>Short term impact</td><td>Medium term impact</td><td>Long term impact</td></tr>
<tr><td>Optimise dynamic space reallocation for parking locations for shared mobility services</td><td>In the short term, the e-scooter parking intervention will contribute to better use of urban space, improved accessibility and safety.</td><td>In the medium term, the practice could be replicable in other areas / cities.</td><td>In the long term, the practice could contribute to better interaction and sharing of public space between pedestrians, cyclists and e-scooter riders.</td></tr>
<tr><td colspan="4">Intervention 3: Improving safety at intersections</td></tr>
<tr><td>Challenge</td><td colspan="3">The number of deaths and injuries among pedestrians and cyclists - although not high compared to many other European cities - remains a cause for concern for Helsinki.
The majority of road accidents involving pedestrians, cyclists or children, happen at junctions and intersections
Novel modes of transport may produce new safety challenges for vulnerable groups, such as the hearing or vision impaired. Since multiple high-speed light rail projects are planned in Finland, the evaluation of solutions to ensure safe interoperation between modes is vital.</td></tr>
<tr><td>Solution 3</td><td>Short term impact</td><td>Medium term impact</td><td>Long term impact</td></tr>
<tr><td>Camera-based observations at accident prone intersections to understand the interactions involving VRUs</td><td>In the short term, proof of concept of a real time warning system will improve safety of VRUs in the pilot location.</td><td>In the medium term, the warning system could be replicable at other tramway intersections.</td><td>In the long term, warning systems could improve safety of VRUs (less accidents, less injuries, less fatalities). Moreover, improved safety could contribute to increased use of active modes. Improved inclusion of vulnerable groups in road safety improvement projects.</td></tr>
<tr><td>Vision</td><td colspan="3">The long term vision for 2050 is that the transport system in Helsinki is safe enough for all groups of people that no one needs to die or be seriously injured in traffic accidents.</td></tr>
</table>

3. Choosing indicators

WHAT YOU NEED TO DO NOW

Pick the indicators for your project. For the impact KPIs, looks which ones are relevant for your city and see which element of your intervention is best suited in measuring this data. If there is a mandatory KPI but you don't have an impact that matched that outcome, you might need to consider adding elements to your solution that will create that impact. And it is always good to talk to the project management about this:

Jason (ICCS), Hans (Technical manager), Monica & James (WP7 leaders)

1. Identify indicators and write them next to the impact on your canvas
2. If you have KPIs that are mandatory for your city but no impact to address them, you will need to return to the previous step and add elements to your intervention that will enable you to achieve those outcomes of the KPIs
3. If you are very unsure on how to address this KPIs, please reach out to the project management team with contacts listed above
4. For the SUMIs, make sure to pick at least one per evaluation area
5. Outside of that, pick as many indicators as you think is useful. Keep in mind that you will need to evaluate the impact of your intervention in WP7, so the more indicators and data you collect, the more secure is a successful evaluation in the end
6. Every indicator has a fully detailed description provided in the Annex
7. Feel free to think of other indicators not part of the provided list. Please use the "light blue" template when describing them
8. Once you have decided on the indicators, will the template "Evaluation indicator". Copy past as many templates as you need and fill one template for each indicator, including the KPIs. Make sure to keep the headers colour coded:
   - dark blue = impact KPIs
   - light purple = SUMI
   - light blue = Other indicators
9. Take a second picture of the canvas (including the indicators) and upload it into the indicated area on your City Plan

Intervention 1: Testing new solutions for collecting, visualizing and analyzing accident-related information

Elaborator Impact KPIs	
Name	3.2 Addressing safety risk for cycling and e-scooters
Result of the evaluation	
Unit	No. of LLs directly addressing safety risk = Helsinki (1)
Method selected	Not decided yet: – recording device in the vehicle OR – Simulation software – Survey o Map-based quantitative survey for the citizens – Public/Private Services database o Accident data o Data from private database (operator data)
Scale of measurement	Producing road safety related information to inform the City's traffic safety measures and instructions issued to light electric vehicle service providers
Periods for data collection	Summer season 2025 (most likely), a few months data collection
Additional comments	It is not decided yet whether the purchased service for intervention 1 will be platform-based or technology-based POC / experiment

Elaborator Impact KPIs	
Name	3.3 Decrease of safety risk
Result of the evaluation	
Unit	Units: – Likert-scale (How safe do you consider travel in Helsinki to be in general / while using the following modes: "Very safe, somewhat safe, neither safe or

	unsafe, somewhat unsafe, very unsafe) – %
Method selected	Methods: – Survey (asking for people's perception on safety) ○ More detailed: Map-based survey Not decided yet, but possible methods: – Recording device in the vehicle – simulation software – Road data from controlled intersection & related devices
Scale of measurement	Map-based resident survey to collect data on sense of safety when traveling as well as the locations of collisions and near-accidents. The survey has been developed in collaboration with the city of Helsinki, and the results can be used to inform road safety work within the city. Survey design will ensure comparability with a previous similar survey carried out in 2020. Data from intervention (data from safety risk platform or e-scooter recording device or other method we decide to use)
Periods for data collection	Autumn 2024 (5 Survey) 2025
Additional comments	This survey completes the view of traffic safety situation in the whole city area. The location having conflicts or which are perceived unsafe will be also checked in the accident statistics - to see if they match. The results of the ELABORATOR survey can also be compared to the results of a similar survey conducted in 2020.

SUM indicator	
Name	3.6 Road deaths

Result of the evaluation	
Unit	Number per year in a selected area

Method selected	Methods:
	– Public/Private Services database
	    o Accident data
	– Survey
	    o Map-based survey
	– Conflict study
	– Proof of concept

Scale of measurement	All can inform road safety policy, contributing to a general improvement in road safety (reduced deaths and injuries)
Periods for data collection	Accident data - continuous collecting Map-based survey, autumn 2024 Conflict study - before the intervention (autumn -24?) and when the warning system has been in use for a while (autumn 25?)
Additional comments	

Intervention 2: Optimizing parking locations for shared e-scooters

Elaborator Impact KPIs	
Name	2.3 75% user acceptance for zero emission services
Result of the evaluation	
Unit	%
Method selected	Methods: – Questionnaire – Interview o Citizens interviews in the location having new parking solutions in place
Scale of measurement	The average reported satisfaction
Periods for data collection	Periods: – 1st period: summer 2024 (before, in eastern city centre)

	– 2nd period: summer 2025
Additional comments	Micro mobility shared services deployed and tested together with infrastructural changes (in Helsinki: physical and virtual parking) score more than 75% user acceptance. Users are asked for each topic: Generally speaking, please tell me if you are 1) satisfied, 2) rather satisfied, 3) rather unsatisfied, 4) not at all satisfied or 5) DK/NA with each of the following issues: safety, usability, efficiency, flexibility, accuracy etc.

Elaborator Impact KPIs	
Name	3.5 3-star rating for pedestrians and micro mobility users
Result of the evaluation	
Unit	%
Method selected	Method: – Using the safety and accessibility star rating system – Interviews ○ Evaluation of optimised e-scooter parking with on-site interviews. Before-and-after study.
Scale of measurement	Star rating system
Periods for data collection	Periods: – Before: Summer 2024 – After: Post-implementation, Autumn 2025
Additional comments	IRAPs methods to be used?

Elaborator Impact KPIs	
Name	5.2 Focus group consultation
Result of the evaluation	
Unit	Units:

	– Number of focus groups = Helsinki (1) – Focus group held (yes/no)
Method selected	Methods: – Workshop – Interview Focus group with relevant stakeholders to evaluate intervention. Method and content to be determined later. Focal points of discussions may be informed by results of the resident survey.
Scale of measurement	According to the stakeholders' mapping
Periods for data collection	TBD
Additional comments	The aim is to made stakeholder consultation at least twice during the project: before and after the intervention Focus group indicator is also valid in intervention 3.

SUM indicator	
Name	1.7 Quality of public spaces
Result of the evaluation	
Unit	% (user satisfaction)
Method selected	Methods: – Surveys – Interviews
Scale of measurement	Can use either numerical (simply 1 - 5) or likert-type of scale. It is anyway important to measure before an intervention and after the intervention has been taken into use - and to compare the satisfaction before vs. after
Periods for data collection	Before the intervention is implemented and after it has been in use for a certain time
Additional comments	

Intervention 3: Improving safety at intersections

Templates:

Elaborator Impact KPIs	
Name	3.1 Solutions in unsafe locations score above 75% user satisfaction
Result of the evaluation	
Unit	Self-reported user satisfaction (scale tbd)
Method selected	Methods: – Questionnaire – interviews, can be organised for individuals (e.g. on site) or as group sessions (focus groups etc.) – Survey
Scale of measurement	At least ordinal scale in the survey
Periods for data collection	Before the intervention is taken into use and after it has been in use for several weeks (to make sure the novelty effect is diminished, but the conditions are otherwise similar as in the before situation - including number of traffic participants, season/weather etc.)
Additional comments	It is important to compare the situation with and without the intervention. And in case of e-scooters, to include both the users and non-users of e-scooters. Users are asked for each topic: Generally speaking, please tell me if you are 1) satisfied, 2) rather satisfied, 3) rather unsatisfied, 4) not at all satisfied or 5) DK/NA with each of the following issues: walking, cycling, e-scooter riding. 3.1 indicator is also valid in intervention 2.

Elaborator Impact KPIs	
Name	3.3 Decrease of safety risk
Result of the evaluation	

Unit	Change in number (+ rate and severity if possible) of pedestrian/bike/e-scooter conflicts with trams.
Method selected	Methods: Traffic conflicts study (video-based monitoring) (intervention 2) Survey (intervention 1)
Scale of measurement	Traffic conflicts analysis at a single road-tramway-cycle/footpath intersection, with a potentially hazardous design. The purpose is to evaluate whether an active warning system could reduce conflicts (and therefore road traffic casualties) with a before-and-after study design. Qualitative data e.g. by asking for people's perception of safety (Survey)
Periods for data collection	Before: Summer/Autumn 2024 After: Summer/Autumn 2025
Additional comments	3.3 indicator is similar with indicator 3.9 Conflicts 3.3 indicator is also valid in intervention 1

Elaborator Impact KPIs	
Name	2.1 Reduction of private car use
Result of the evaluation	
Unit	Modal split, %
Method selected	Various methods: Survey, including qualitative and quantitative user surveys existing data on current modal split (which is based on various data collection methods, such as traffic counts (11) and sensors & cameras (12)
Scale of measurement	This will be measured via improvements of safety and accessibility of active modes, including better use of public space, citizen involvement of places or routes

	they find too dangerous or complicated currently and important input to the city safety planning. All our interventions contribute toward a long-term transition towards a multimodal and less car-based transport system in Helsinki through improvements to safety (and sense of safety) for pedestrians and cyclists, encouraging the use of active modes. Safety (and a good sense of safety) is a prerequisite for travel with any mode, but particularly active modes given their vulnerability. Current modal split will be use as a baseline and the estimated impact of interventions on modal split will be done with the support of data from stated preference of drivers to change to other modes (-> future modal split)
Periods for data collection	continuous throughout the project, before and after implementation
Additional comments	Impact indirectly via improving the VRU conditions, accessibility, and hence potentially reduce the use of private cars.

Elaborator Impact KPIs	
Name	2.4 5% increase in desired modal split
Result of the evaluation	
Unit	Modal split, %
Method selected	Various methods: Survey, including qualitative and quantitative user surveys existing data on current modal split (which is based on various data collection methods, such as traffic counts (11) and sensors & cameras (12)
Scale of measurement	This will be measured via improvements of safety and accessibility of active modes, including better use of public space, citizen involvement of places or routes

	they find too dangerous or complicated currently and important input to the city safety planning. All our interventions contribute toward a long-term transition towards a multimodal and less car-based transport system in Helsinki through improvements to safety (and sense of safety) for pedestrians and cyclists, encouraging the use of active modes. Safety (and a good sense of safety) is a prerequisite for travel with any mode, but particularly active modes given their vulnerability. Current modal split will be use as a baseline and the estimated impact of interventions on modal split will be done with the support of data from stated preference of drivers to change to other modes (-> future modal split)
Periods for data collection	continuous throughout the project, before and after implementation
Additional comments	Impact indirectly via improving the VRU conditions, accessibility, and hence potentially reduce the use of private cars.

Elaborator Impact KPIs	
Name	4.1 Increase in use of zero emission modes
Result of the evaluation	
Unit	% (modal split) Inferred indirect effect based on evaluation results for all interventions
Method selected	Various methods (see the KPIs above): Survey, including qualitative and quantitative user surveys Counting sensors and cameras, Video-based monitoring

	Public and private service database, including public transport operational data Traffic counts
Scale of measurement	All our interventions contribute toward a long-term transition towards a multimodal and less car-based transport system in Helsinki through improvements to safety (and sense of safety) for pedestrians and cyclists, encouraging the use of active modes. Safety (and a good sense of safety) is a prerequisite for travel with any mode, but particularly active modes given their vulnerability.
Periods for data collection	continuous throughout the project
Additional comments	Impact indirectly via improving the VRU conditions, accessibility, and hence potentially reduce the use of private cars.

Elaborator Impact KPIs	
Name	4.2 Reduction of emissions
Result of the evaluation	
Unit	% of shares with a qualitative score (1-5) of the perception of quality Inferred indirect effect based on evaluation results for all interventions Can also be measured via modal split, and taking into account the changes in vehicle fleet (share of zero-emission vehicles).
Method selected	Various methods: Survey, including qualitative and quantitative user surveys Counting sensors and cameras, Video-based monitoring Public and private service database Traffic counts
Scale of measurement	User / provider / stakeholder average reported satisfaction with

	The overall quality of the transport system (public transport, cycling, walking...) The quality of a specific service All our interventions contribute toward a long-term transition towards a multimodal and less car-based transport system in Helsinki through improvements to safety (and sense of safety) for pedestrians and cyclists, encouraging the use of active modes. Safety (and a good sense of safety) is a prerequisite for travel with any mode, but particularly active modes given their vulnerability.
Periods for data collection	continuous throughout the project, before and after implementation
Additional comments	Impact indirectly via improving the VRU conditions, accessibility, and hence potentially reduce the use of private cars.

Elaborator Impact KPIs	
Name	4.5 increase in quality-adjusted life years
Result of the evaluation	
Unit	% Inferred indirect effect based on evaluation results for all interventions
Method selected	Various methods: Counting sensors and cameras, Video-based monitoring Public and private service database Traffic counts
Scale of measurement	All our interventions contribute toward a long-term transition towards a multimodal and less car-based transport system in Helsinki through improvements to safety (and sense of safety) for pedestrians and cyclists, encouraging the use of active modes. Safety (and a good sense of safety) is a prerequisite for travel with any mode, but particularly active modes given their vulnerability.

Periods for data collection	continuous throughout the project
Additional comments	Impact indirectly via improving the VRU conditions, accessibility, and hence potentially reduce the use of private cars. Increasing active mobility improves health.

Elaborator Impact KPIs	
Name	4.6 Reduction in exposure to air and noise pollution
Result of the evaluation	
Unit	Inferred indirect effect based on evaluation results for all interventions
Method selected	Various methods: Survey, including qualitative and quantitative user surveys Counting sensors and cameras, Video-based monitoring Public and private service database Traffic counts
Scale of measurement	All our interventions contribute toward a long-term transition towards a multimodal and less car-based transport system in Helsinki through improvements to safety (and sense of safety) for pedestrians and cyclists, encouraging the use of active modes. Safety (and a good sense of safety) is a prerequisite for travel with any mode, but particularly active modes given their vulnerability.
Periods for data collection	continuous throughout the project
Additional comments	Impact indirectly via improving the VRU conditions, accessibility, and hence potentially reduce the use of private cars.

Elaborator Impact KPIs	
Name	5.1 Toolkit adaptation and deployment

Result of the evaluation	
Unit	Number of toolkits adopted and deplyed
Method selected	In Helsinki the use of ELABORATOR toolkits are unsure.
Scale of measurement	If deployed: Before: explain the purpose in using the selected toolkit and, its relationship with the intervention. During: show evidence of the usage of the toolkit, where and how it is used. After: show the results obtained and its usage for active participation, data platform, and visualization tool.
Periods for data collection	If deployed: starting before intervention
Additional comments	In Helsinki the use of ELABORATOR toolkits are unsure. We already have tools in use, which are collecting similar information (e.g. airquality, continuous measurements, calibrated traffic cameras). If we collecting data with portable Lidar, would it be suitable for this 5.1 indicator?

SUM indicator	
Name	3.7 Traffic safety active modes
Result of the evaluation	
Unit	Change in number (+ rate and severity if possible) of pedestrian/bike/e-scooter conflicts with trams.
Method selected	Methods: Public and Private service data base Counting sensors and cameras Effect inferred based on proxy measure (traffic conflicts, video-based monitoring)
Scale of measurement	Traffic conflicts analysis at a single road-light rail-cycle/footpath intersection, with a potentially hazardous design. The purpose is to evaluate whether an active warning system could reduce conflicts (and

	therefore road traffic casualties) with a before-and-after study design.
Periods for data collection	Before: Summer/Autumn 2024 After: Summer/Autumn 2025
Additional comments	

Another indicator	
Name	3.9 Conflicts
Result of the evaluation	
Unit	Change in number (+ rate and severity if possible) of pedestrian/bike/e-scooter conflicts with trams.
Method selected	Traffic conflicts study
Scale of measurement	Traffic conflicts analysis at a road-tramway-cycle/footpath intersection, with a potentially hazardous design. The purpose is to evaluate whether an active warning system could reduce conflicts with a before-and-after study design.
Periods for data collection	Before: Summer/Autumn 2024 After: Summer/Autumn 2025
Additional comments	

4. Data collection methods

WHAT YOU NEED TO DO NOW
For each indicator, choose the appropriate methods to collect data. Often, it is good to have both qualitative and quantitative data for an indicator so that you can get a more accurate picture. Below we provide a list of suggested qualitative and quantitative data collection methodologies. Each of them has guidelines attached. These guidelines should help collect data the right way to be used for evaluation purposes. Feel free to also choose others, these here are just suggestions. It might still be useful to look at the guidelines for our suggested methodologies, as they might be applicable for your own methodologies, too. 1. Select methodologies making sure every indicator has a method allocated. It is possible to use the same method, or the data collected for multiple indicators 2. Fill in the template “Data collection methodologies”. Copy and paste as many as you need to fill one template for each methodology

Data collection methodology	
Name of the methodology	2 Interview
Type of data collected	Qualitative data from structured / unstructured / semi-structured interviews
Evaluation indicators addressed	1.7 Quality of public spaces 2.3 75% user acceptance for zero emission services 3.1 Solutions in unsafe locations score above 75% user satisfaction 3.5 3-star rating for pedestrians and micro mobility users 5.2 Focus group consultation
Resources and equipment needed	One-to-one meetings, workshops, interviews in LL areas
Timeline for data collection	2024 onwards

Data collection methodology

Name of the methodology	3 Workshop
Type of data collected	Qualitative data Expert knowledge, in situ experience, stakeholders opinions etc.
Evaluation indicators addressed	5.2 Focus group consultation
Resources and equipment needed	Organizing workshops
Timeline for data collection	2024 onwards

Data collection methodology	
Name of the methodology	4 Questionnaire
Type of data collected	Quantitative data and qualitative data
Evaluation indicators addressed	2.3 75% user acceptance for zero emission services 3.1 Solutions in unsafe locations score above 75% user satisfaction
Resources and equipment needed	Map-based survey software
Timeline for data collection	Autumn 2024 onwards

Data collection methodology	
Name of the methodology	5 Survey
Type of data collected	Map-based resident survey to collect data on sense of safety when traveling as well as the locations of collisions and near-accidents. The survey has been developed in collaboration with the city of Helsinki, and the results can be used to inform road safety work within the city. Survey design will ensure comparability with a previous similar survey carried out in 2020.
Evaluation indicators addressed	1.7 Quality of public spaces

	3.1 Solutions in unsafe locations score above 75% user satisfaction 3.2 Addressing safety risk for cycling and e-scooters 3.3 Decrease of safety risk 3.6 Road deaths 4.2 Reduction of emissions
Resources and equipment needed	Purchase of map-based survey tool
Timeline for data collection	2024 onwards

Data collection methodology	
Name of the methodology	7 Simulation Software
Type of data collected	Not decided yet if we are going to use this data collection methodology. It is possible that we could use some kind of data-collection platform to evaluate safety risk.
Evaluation indicators addressed	3.2 Addressing safety risk for cycling and e-scooters 3.3 Decrease of safety risk
Resources and equipment needed	Safety risk platform as a purchase.
Timeline for data collection	2025

Data collection methodology	
Name of the methodology	8 Recording device in the vehicle
Type of data collected	Not decided yet if we are going to use this data collection methodology. It is possible that we could use some kind of recording device in e-scooters.
Evaluation indicators addressed	3.2 Addressing safety risk for cycling and e-scooters 3.3 Decrease of safety risk

Resources and equipment needed	E-scooter safety tech study as a purchase. Needed equipment provider, e-scooter operator and City of Helsinki in co-operation.
Timeline for data collection	2025

Data collection methodology	
Name of the methodology	11 Traffic counts
Type of data collected	Cycling and pedestrian data
Evaluation indicators addressed	2.1 Reduction of private car use 2.4 Increase in desired modal split 4.1 Increase in use of zero emission modes 4.2 Reduction of emissions 4.5 increase in quality-adjusted life years 4.6 Reduction in exposure to air and noise pollution
Resources and equipment needed	Counting sensor or camera Automatic traffic counting points https://helsinki-public.azurewebsites.net/ Traffic counts https://kaupunkitieto.hel.fi/fi/liikenne, Machine counting points https://data.eco-counter.com/ParcPublic/?id=5589
Timeline for data collection	2024 onwards

Data collection methodology	
Name of the methodology	12 Counting sensors and cameras
Type of data collected	Cycling and pedestrian data
Evaluation indicators addressed	2.1 Reduction of private car use 2.4 Increase in desired modal split

	3.7 Traffic safety active modes 4.1 Increase in use of zero emission modes 4.2 Reduction of emissions 4.5 increase in quality-adjusted life years 4.6 Reduction in exposure to air and noise pollution
Resources and equipment needed	Counting sensors, cameras, Lidars
Timeline for data collection	2024 onwards

Data collection methodology	
Name of the methodology	13 Public/Private Services database
Type of data collected	Accident data Data from private database (operator data) Air quality data
Evaluation indicators addressed	3.2 Addressing safety risk for cycling and e-scooters 3.6 Road deaths 3.7 Traffic safety active modes 4.2 Reduction of emissions 4.5 increase in quality-adjusted life years 4.6 Reduction in exposure to air and noise pollution
Resources and equipment needed	Data analyzing skills and access to private databases
Timeline for data collection	2025

Data collection methodology	
Name of the methodology	14 Road data from controlled intersection & related devices
Type of data collected	Data collection from traffic / pedestrian crossing

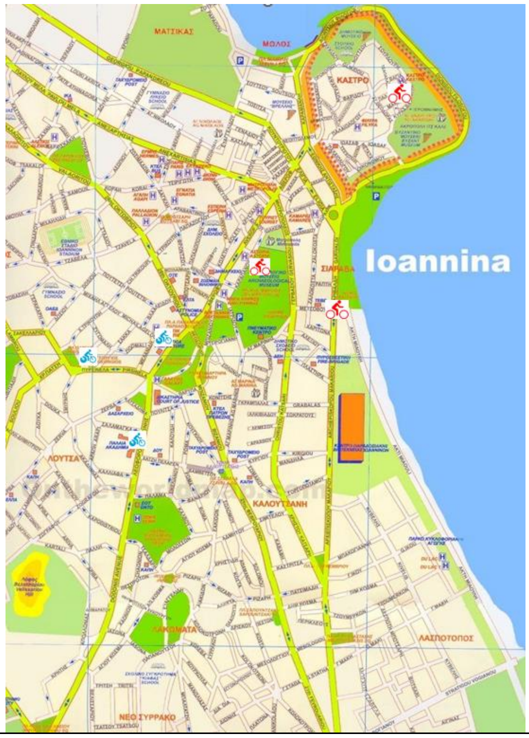
	Collection and analysis of information on used safety margins, frequency of conflicts, severity, etc.
Evaluation indicators addressed	3.3 Decrease of safety risk
Resources and equipment needed	Video cameras / Lidar / Drone
Timeline for data collection	2024 onwards

Data collection methodology	
Name of the methodology	Conflict study
Type of data collected	Number and severity of conflicts before and after the new warning system is implemented in the crossing.
Evaluation indicators addressed	3.2 Addressing safety risk for cycling and e-scooters 3.3 Decrease of safety risk 3.6 Road deaths (strong evidence of a correlation between conflicts and accidents based on previous studies) 3.7 Traffic safety active modes 3.9 Conflicts
Resources and equipment needed	Cameras to collect the videos on-site, software to detect and analyse the conflicts from the video-stream.
Timeline for data collection	Pre-study late summer/autumn 2024 - and post study when the system has been in place for several weeks. Rather during the similar traffic conditions than the pre-study (ideally both late August, pre-study 2024 and post-study 2025) - but depending on the schedule of the installation of the system, which is depending on many organisations and needs e.g. permissions etc.

Annex VIII: Evaluation Plan Ioannina

1. Description of the intervention

Intervention description	
Overall description	**Promoting shared, micro-vehicle solutions to boost smart and sustainable mobility**
Elements	Ioannina will unfold the potential of micromobility by investing in smart bike docks as well as e-bikes. More specifically, the integrated solution will include: 3 Docks bike stations: each one which will include 10 locking/charging bays and will allow bikes to be charged while locked at the station. 14 electric bikes Smart platform for micromobility: A platform for detecting docks and e-bikes in order to freely use the e-bike for as long as they wish, returning it to one of docks. The platform will record movements, users and other useful statistics for the city
Main users	All citizens, visitors & bike users
Boundaries	City of Ioannina (red bikes suggest main areas and blue bikes alternative areas)

	
Area and location	3 areas are suggested including:

2. Developing evaluation goal

Theory of change						
Challenge	• Reverse the use of cars • Change mentality and perception for urban use of bikes • Convince citizens that daily urban duties (school, child activities, leisure etc) can be served by bikes • Reduce space for cars and give it back to the bikers • Reduce GHG emissions • Create climate neutral zones					
Solution 1	**Short term impact**		**Medium term impact**		**Long term impact**	
Place e-bike docks in car parking areas	Reduce car parking spots and discourage car users	More space for bikes	Measure use and provide data for the use of docks	Start "marking" urban areas free of cars	Measure success and introduce more free-car areas	Free space for e-bikes and bike users by installing more e-bike docks
Solution 2	**Short term impact**		**Medium term impact**		**Long term impact**	

Introduce e-bikes for micromobility	Introduce new ways of smart mobility	Increase bike rates	Change mentality and perception for urban use of bikes	Accelerate commercialization of e-bikes	Reduce GHG emissions and open the way towards creating climate neutral zones	Introduce new policy for managing public spaces and use of bikes
Solution 3	**Short term impact**		**Medium term impact**		**Long term impact**	
Smart platform for bike use	Gather real-time data from various areas around the city	City interaction with citizens, visitors and bikers	Change traffic management according to data gathered from platform	Provide real time information and reports to platform users for urban mobility (include more bike stations as well as other means of smart, micro-mobility)	Change driver behavior by applying monitoring and analytic tools	Reward users of smart-micromobility platform
Vision	Use smart, micro-mobility to improve the quality of life by returning public space from car to bikers and sustainable users					

3. Choosing indicators

Elaborator Impact KPIs (workplan)	
Name	**1.1 Expand interventions beyond the LL**
Result of the evaluation	Scale up and expand the intervention
Unit	Number of e-bikes in the city / Number of e-bike docks in the city
Method selected	Survey, questionnaire
Scale of measurement	City level
Periods for data collection	Before:2024 After:2025
Additional comments	

Elaborator Impact KPIs (workplan)	
Name	**1.3 Addressing rebalance of public space to achieve desired modal split**

Result of the evaluation	Shift of modal split based on bikes
Unit	% square meters, % change in modal split
Method selected	Survey, GIS Mappings
Scale of measurement	City level
Periods for data collection	Before:2023/2024 After:2025
Additional comments	Overlap to SUMI 2.8

Elaborator Impact KPIs	
Name	**2.1 Reduction of private car use**
Result of the evaluation	Reduce private car users, increase bike users
Unit	% change in modal split
Method selected	Survey, Questionnaire, Parking counts, Data from platform – on-line questionnaire, potential gamification in the future
Scale of measurement	City level
Periods for data collection	Before:2023/2024 After:2025
Additional comments	Related to SUMI 2.8

Elaborator Impact KPIs	
Name	**2.2 Deployment of Zero Emission and shared mobility services**
Result of the evaluation	1 shared mobility service (smart platform for e-bike free use)
Unit	Number of users
Method selected	Data from platform
Scale of measurement	City level
Periods for data collection	Before:2023/2024 After:2025
Additional comments	

Elaborator Impact KPIs	
Name	**2.4 5% increase of desired modal split**
Result of the evaluation	increase in the use of active mobility modes of transport
Unit	% change in modal split
Method selected	Survey, Questionnaire, Data from platform – on-line questionnaire, potential gamification in the future
Scale of measurement	City level
Periods for data collection	Before:2023/2024 After:2025

Additional comments	Related to SUMI no 2.8

Elaborator Impact KPIs (workplan)	
Name	**3.3 Decrease of safety risks**
Result of the evaluation	Enhanced feeling of safety, reduction in actual risks
Unit	%
Method selected	Survey, Questionnaire, Data from platform – on-line questionnaire
Scale of measurement	City level
Periods for data collection	Before:2024 After:2025 (after implementation)
Additional comments	

Elaborator Impact KPIs	
Name	**4.1 Increase of Zero Emission modes**
Result of the evaluation	Increase interest for cycling and e-biking
Unit	% of increase in number of trips in the city
Method selected	Survey, questionnaire, use of smart platform
Scale of measurement	City level
Periods for data collection	Before:2024 After:2025 (after implementation)
Additional comments	

Elaborator Impact KPIs	
Name	**4.2 Reduction of emissions**
Result of the evaluation	reduction of GHG emission
Unit	% of reduction in GHG
Method selected	Survey, questionnaire, smart platform
Scale of measurement	City level
Periods for data collection	Before:2024 After:2025
Additional comments	Link to KPI 4.1 and connect to km of biking instead of using other method

Elaborator Impact KPIs	
Name	**4.3 Climate city contracts supported**

Result of the evaluation	contribute to the Ioannina's SUMPs and have an impact on the mission
Unit	Number of actions GHG emissions from private vehicles account for a big share of the city's carbon footprint
Method selected	Survey, questionnaire, smart platform
Scale of measurement	City level
Periods for data collection	Before:2024 After:2025
Additional comments	Connect the action to the CCC Investment plan

Elaborator Impact KPIs	
Name	**4.5 Increase of quality-adjusted life years**
Result of the evaluation	
Unit	%
Method selected	interview, Questionnaire, Survey
Scale of measurement	City level
Periods for data collection	Before and after implementation
Additional comments	

Elaborator Impact KPIs	
Name	**4.6 Reduction in exposure to air and noise pollution**
Result of the evaluation	
Unit	Number
Method selected	interview, Questionnaire, Survey
Scale of measurement	City level
Periods for data collection	Before and after implementation
Additional comments	Connect the action to the CCC Investment plan

Elaborator Impact KPIs	
Name	**5.1 Toolkits adopted and deployed**
Result of the evaluation	Smart platform toolkig
Unit	Number of toolkits adopted and deployed
Method selected	1) Explain purpose of smart platform (in order to secure that people will use it), 2) Show evidence of usage of toolkit (count users), 3) Show results and usage as tool for active participation, data platform, and visualization

Scale of measurement	City level
Periods for data collection	During the project
Additional comments	

Elaborator Impact KPIs	
Name	**5.2 Focus group consultation**
Result of the evaluation	Engage stakeholders, increase knowledge
Unit	Number of focus groups
Method selected	Stakeholder mapping and engagement, Use platform for measuring, organize Workshops with VRUs and stakeholders.
Scale of measurement	City level
Periods for data collection	2024-2025: Inform and promote, 2026: measure satisfaction
Additional comments	

SUM indicator	
Name	**1.5 Opportunity for active mobility**
Result of the evaluation	Increase space and means for active mobility
Unit	% square meters (share of road length adapted for biking)
Method selected	Survey, GIS mapping, Public and private services database, Google Map / Open Street map
Scale of measurement	City level
Periods for data collection	Before 2023/2024 Afte 2025
Additional comments	

SUM indicator	
Name	**1.7 Quality of public spaces**
Result of the evaluation	Increase quality of public spaces by reducing space for cars and introducing more space for bikers
Unit	Questionnaire (use satisfaction scale), survey,
Method selected	Survey, Stop interviews, Data from platform – on-line questionnaire, potential gamification in the future
Scale of measurement	Scale of satisfaction
Periods for data collection	Immediate impact (2025), Long term impact after use (2026)

Additional comments	Similar use-overlap with 5.7

SUM indicator	
Name	**4.13 Greenhouse gas emissions (GHG)**
Result of the evaluation	Reduce air pollution in the city
Unit	Tonne CO2 equivalent emissions by urban transport per annum per capita
Method selected	Survey, data from smart platform, national data .
Scale of measurement	
Periods for data collection	Before (2019-2023 according to the city's SECAP) and after (2025-2026) the interventions
Additional comments	

Another indicator	
Name	5.6 Awareness level
Result of the evaluation	Increase Awareness level for use of bike and smart mobility
Unit	% of awareness
Method selected	Survey, questionnaire, use of smart platform
Scale of measurement	City level, users
Periods for data collection	2024, 2025 and 2026
Additional comments	

Another indicator	
Name	**5.7 Intervention acceptance level**
Result of the evaluation	Level of acceptance of the intervention
Unit	% of acceptance
Method selected	Survey (bike users), Workshops/Focus group (link to KPI 5.1)
Scale of measurement	- level of acceptance (% of users with good understanding of the interventions)
Periods for data collection	Survey - Before (2024) and after (2025-2026) Qualitative methods Workshops
Additional comments	link to KPI 5.1 relevance-overlap with SUMI 1.7

Another indicator	
Name	**5.12 Citizen's satisfaction with the mobility and public space infrastructure**
Result of the evaluation	User/provider/stakeholder average reported satisfaction
Unit	Survey, qualitative research, use of smart platform to evaluate
Method selected	Survey (bike users), Workshops/Focus group (link to KPI 5.1)
Scale of measurement	- level of acceptance (% of users with good understanding of the interventions)
Periods for data collection	Survey - Before (2024) and after (2025-2026) Qualitative methods Workshops
Additional comments	link to KPI 5.1 relevance-overlap with indicator 5.7

4. Selecting data collection methods

Data collection methodology	
Name of the methodology	Survey
Type of data collected	Qualitative and quantitative
Evaluation indicators addressed	KPIs: 1.1, 1.3, 2.1, 2.4, 3.3, 4.1, 4.2, 4.3, 4.5 SUMIs: 1.5. 1.7, 4.13 Other: 5.6, 5.7, 5.12

Resources and equipment needed	Manhours
Timeline for data collection	Before intervention, 2024 and short-term impacts of intervention 2025-2026.

Data collection methodology	
Name of the methodology	Questionnaire
Type of data collected	Qualitative and quantitative
Evaluation indicators addressed	KPIs: 1.1, 2.1, 2.4, 3.3, 4.1, 4.2, 4.3, 4.5 SUMIs: 1.7 Other: 5.6
Resources and equipment needed	Manhours
Timeline for data collection	Before intervention, 2024 and short-term impacts of intervention 2025-2026.

Data collection methodology	
Name of the methodology	Data collection from “smart platform”
Type of data collected	Qualitative, quantitative, map-location data, travel data
Evaluation indicators addressed	KPIs: 2.1, 2.2, 2.4, 3.3, 4.1, 4.2, 4.3, 5.1, 5.2 SUMIs: 1.7, 4.13 Other: 5.6, 5.12
Resources and equipment needed	Smart platform, internet, software
Timeline for data collection	2024 and short-term impacts of intervention 2025-2026

Data collection methodology	
Name of the methodology	GIS Mappings
Type of data collected	Quantitative, map-location data, travel data
Evaluation indicators addressed	KPIs: 1.3, SUMIs: 1.5 Other: -
Resources and equipment needed	Smart platform, software
Timeline for data collection	2024 and short-term impacts of intervention 2025-2026

Data collection methodology	
Name of the methodology	Gamification
Type of data collected	Qualitative, quantitative, behavioural, educationa
Evaluation indicators addressed	KPIs: 2.1, 2.4 SUMIs: 1.7 Other: -
Resources and equipment needed	Smart platform, software, manhours, smart application
Timeline for data collection	2025-2026

Data collection methodology	
Name of the methodology	Workshop
Type of data collected	Qualitative and quantitative
Evaluation indicators addressed	KPIs: 5.2, SUMIs: Other: 5.7, 5.12

Resources and equipment needed	Manhours, space, projector, material (papers, pen etc), facilitators, coffee, stakeholders
Timeline for data collection	2024, 2025, 2026

Data collection methodology	
Name of the methodology	Interviews
Type of data collected	Stop interviews conducted in streets and public spaces. Qualitative and quantitative data measuring related to levels of satisfaction and suggestions for improvement
Evaluation indicators addressed	KPIs: 5.2 SUMIs: 1.7 Other: 5.7, 5.12
Resources and equipment needed	Manhours, Interview format, tablets, on-line software.
Timeline for data collection	2025-2026

Annex IX: Evaluation Plan Issy-les-Moulineaux

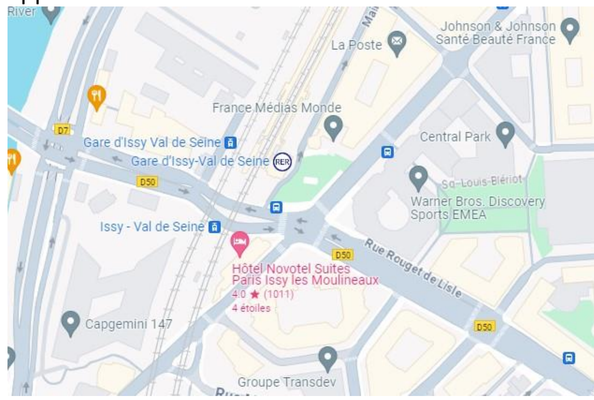
1. Description of the intervention

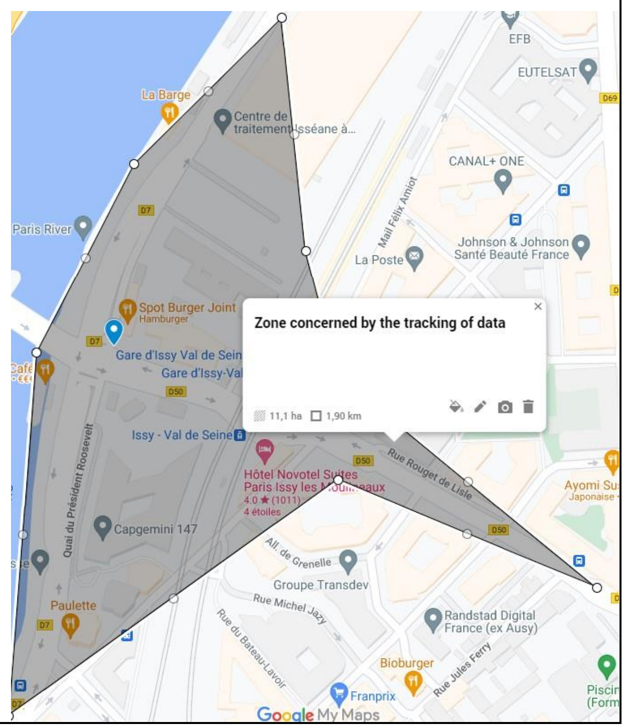
WHAT YOU NEED TO DO NOW
Use the template to fill in the description about your intervention. Descriptions for each item in the table are found in Part 2 of the Evaluation Plan Framework.

Intervention description	
Overall description	The LL will propose a response by designing and organizing a better way to share streets with a multi modes approach in the district of Issy Val de Seine, the economical center of the city and one of the major innovation hub in the Greater Paris Metropolitan area with 70 000 people that come to the city each day, doubling the population. The City's objective is to ensure safety and collaboration of different modes for better neighborhoods, especially at an intersection where there is a critical conflict area between vehicles, bike users and pedestrians, leading to a necessary intervention. The first intervention will consist on the experimentation of the Flowell technology developed by Colas that consists of a floor light marking system that will allow a better perception of the incoming cyclists in the selected area with less conflict interactions between road users. This experimentation will also lead to the development of the use of alternative ways of transport in the selected area. Changes in user behavior (road and bike) will be monitored in a mobility observatory (powered by Urban Radar). This observatory will aggregate several sources of data and will be the dynamic monitoring tool for measuring the impact of the actions implemented. The city of Issy-les-Moulineaux also intends to reduce the air pollution aligned with the objectives that the city has fixed towards climate neutrality in 2050 and the annual objectives that can be found in the climate

	budget, first adopted in 2021 for concrete every year actions.
Elements	Sensors, floor light marking system installed by Colas
Main users	Bike users, road users
Boundaries	This experimentation can only be done at one intersection at the moment reducing the potential impact on a specific road, identified as dangerous for cyclists. A later expansion can be foreseen in case of success of the first experimentation.
Area and location	The area selected for the experimentation is located at one of the key points of the city of Issy-les-Moulineaux in the business district of the city with a huge part of the traffic in the city going on in the area. This area is also an exchanger between different cities and is near to the waste treatment site allowing a high number of trucks present on the roads.  

Intervention description	
Overall description	The LL will propose a response by designing and organizing a better way to share streets with a multi modes approach in the district of Issy Val de Seine, the economical center of the city and one of the major innovation hub in the Greater Paris Metropolitan area with 70 000 people that come to the city each day, doubling the population. The City's objective is to ensure safety and collaboration of different modes for better neighborhoods, especially at an intersection where there is a critical conflict area between vehicles, bike users and pedestrians, leading to a necessary intervention. The second intervention will consist on the experimentation of the GecoAir application developed by IFPEN and that helps the citizens to know better the air pollution and how to fight effectively against it. The results obtained by the application will be one of the potential sources for the mobility observatoryThe city of Issy-les-Moulineaux also intends to reduce the air pollution aligned with the objectives that the city has fixed towards climate neutrality in 2050 and the annual objectives that can be found in the climate budget, first adopted in 2021 for concrete every year actions. The development of this application will also be useful in this perspective as it will come from data collected in the area allowing the city to readjust almost in real-time the objectives of the climate budget according to the collected data.
Elements	Application, sensors, collection of data
Main users	Citizens of the city and people who come to Issy for their work. Road users, bike users, pedestrians. Here, the goal is to have the largest number of users.
Boundaries	The application needs to be downloaded and used by a certain amount of people in order to be effective in the collection of data.
Area and location	The area selected for the experimentation is located at one of the key points of the city of Issy-les-Moulineaux in the business district of the city with a huge part of the traffic in the city going on in the area. The whole district will be considered for the use of the GecoAir

<table>
<tr>
<td></td>
<td>application.
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2. Evaluation goal

WHAT YOU NEED TO DO NOW
You will need to fill a canvas of your Theory of Change. It is the same one we used for the workshop in Issy. Those are good starting points to complete and tidy up your Theory of Change. Pictures are uploaded on SharePoint: Pictures from workshop in Issy 1. Download and print another canvas in your office OR use is digitally by downloading it on your computer and using PDF reader to fill the boxes Impact Canvas.pdf 2. Complete all sections, ensure that everything is well connected and there are no “free flowing” items on the canvas 3. Take a picture (Do not upload it for now)

4. Fill the information into the template "Theory of Change". We highly recommend doing this after you have gone through the canvas and prioritized your project goals

Canvas

"Theory of Change", download here : Impact Canvas.pdf

Pictures from Issy Workshop: Pictures from workshop in Issy

Theory of change						
Challenge	• Risk of safety for all road users, whether they are pedestrians, cyclists, car users or else					
Solution 1	Short term impact		Medium term impact		Long term impact	
Flowell (developed by Colas)	Increase the safety in the area by having luminous information towards the road users in order for them to navigate safely and to take into account the other users	Road safety: less conflict interaction between different transport modes VRU awareness for road users	Less conflicts between cars and vulnerable road users	Better inclusivity	Long term change of behaviors for road users	Less accidents between cars and VRUs Greater use of bikes
Solution 2	Short term impact		Medium term impact		Long term impact	
Sensors	Better knowledge of road users' habits		Measure the evolution of the situation since the beginning of the project.		Urban design: help of the sensors to have a clearer view of the urban design with the help of data	
Solution 3	Short term impact		Medium term impact		Long term impact	
Mobility data analysis using sources such as	Information to the users about air quality in the district	Helping the city of Issy-les-Moulineaux to achieve its	Helping to define new objectives for the climate budget	Developing indicators to feed the mobility observatory	Help for the amelioration of the air quality in the city	Urban design : with the collected data: better knowledge

GecoAir (by IFPEN)		goals towards climate neutrality Identification of incident zones based on hard braking signals Monitoring the environmental footprint of mobility in the city		Monitoring incidentogenic city trends		about air quality and the manners of improving it.
Solution 4	Short term impact		Medium term impact		Long term impact	
Mobility Observatory (by Urban Radar)	Visualize and measure mobility on a city scale, using a variety of travel methods (bicycle, car, public transport, etc.).	Helping the city of Issy-les-Moulineaux to identify other potentially risky areas	Inform decision-making with data-based analysis	Helping the city of Issy-les-Moulineaux to improve city planning	Monitor the impact of decisions taken.	Helping the city of Issy-les-Moulineaux to monitor the impact of decisions taken.
Vision	The vision of the city of Issy-les-Moulineaux towards this project is to promote the use of bikes and non-pollutant transportation methods by increasing the security for bike users and VRU as this is one of the main concerns of the city at the time. Therefore, the different experiments that will be conducted in the city will lead to a better understanding of the repartition of mobility in a first time and then will evolve into a policy of reducing the risks and the conflicts between all type of road users with a focus on the interactions between bikes and other road users on a particular area of the city that has been evaluated as at high risk during the last years, leading to a high risk of conflicts. The goal is to pacify this zone and to allow more people, especially VRU like families to use other methods of mobility like the bikes, also in order to join the island, called Ile-Saint-Germain, located right next to the area with a great park where a lot of families are going. The vision of the city is also on a long term a project named Axe de Vie that will reshape entirely the urban design of the major roads of the city leading to more space for pedestrians, bike users and VRUs and the project will help the city to finalize the approach of this future project by collecting important data towards potential changes in mobility in the city.					

	The vision of the city also aligns with the objectives fixed in the climate budget first adopted in 2021 with annual objectives and an end objective of having a climate neutral city for 2050 as this budget also includes air pollution aspects leading to having to reduce them. Here again, the project will help the city to achieve its objectives by helping the city in the definition of the key actions towards air pollution reduction.

3. Evaluation indicators

WHAT YOU NEED TO DO NOW
Pick the indicators for your project. For the impact KPIs, looks which ones are relevant for your city and see which element of your intervention is best suited in measuring this data. If there is a mandatory KPI but you don't have an impact that matched that outcome, you might need to consider adding elements to your solution that will create that impact. And it is always good to talk to the project management about this: Jason (ICCS), Hans (Technical manager), Monica & James (WP7 leaders) 1. Identify indicators and write them next to the impact on your canvas 2. If you have KPIs that are mandatory for your city but no impact to address them, you will need to return to the previous step and add elements to your intervention that will enable you to achieve those outcomes of the KPIs 3. If you are very unsure on how to address this KPIs, please reach out to the project management team with contacts listed above 4. For the SUMIs, make sure to pick at least one per evaluation area 5. Outside of that, pick as many indicators as you think is useful. Keep in mind that you will need to evaluate the impact of your intervention in WP7, so the more indicators and data you collect, the more secure is a successful evaluation in the end 6. Every indicator has a fully detailed description provided in the Annex 7. Feel free to think of other indicators not part of the provided list. Please use the "light blue" template when describing them 8. Once you have decided on the indicators, will the template "Evaluation indicator". Copy past as many templates as you need and fill one template for each indicator, including the KPIs. Make sure to keep the headers colour coded: - dark blue = impact KPIs - light purple = SUMI - light blue = Other indicators 9. Take a second picture of the canvas (including the indicators) and upload it into the indicated area on your City Plan

Mobility Planning

Elaborator Impact KPIs (workplan)	
Name	**1.1 Expand intervention beyond the LL**
Result of the evaluation	Number of developed interventions beyond the lighthouse and in the follower city
Unit	Number
Method selected	Number of interventions
Scale of measurement	Experimentation level, city level and project level
Periods for data collection	During and after the experimentation in Issy-les-Moulineaux
Additional comments	

SUMI	
Name	**1.5 Opportunity for active mobility**
Result of the evaluation	Number of bike users
Unit	%
Method selected	Traffic counts, bike counting sensors
Scale of measurement	Experimentation level + city level
Periods for data collection	Before, during and after the experimentation phase
Additional comments	

SUMI	
Name	1.7 Quality of public spaces
Result of the evaluation	Increased quality of public spaces
Unit	%
Method selected	Satisfaction Questionnaires
Scale of measurement	Experimentation level
Periods for data collection	Before, during and after the experimentation
Additional comments	

Smart Mobility Indicators

Elaborator Impact KPIs (workplan)	
Name	2.1 Reduction of private car use (ALL LLs)
Result of the evaluation	Reduced car use
Unit	%
Method selected	Traffic counts, Sensors, Public and private service database
Scale of measurement	City level & experimentation level
Periods for data collection	Before and after implementation
Additional comments	

Elaborator Impact KPIs (workplan)	
Name	2.4 5% increase of desired modal split (All LLs)
Result of the evaluation	Increase of active transportation mode
Unit	%
Method selected	Questionnaires, Traffic counts
Scale of measurement	City level & experimentation level
Periods for data collection	Before and after implementation
Additional comments	

SUMI	
Name	**2.8 Modal split**
Result of the evaluation	Evolution of modal split aiming for an increase in the use of active mobility modes of transport.
Unit	Passenger-kilometre (pkm)
Method selected	Questionnaires, Traffic counts
Scale of measurement	City level & experimentation level
Periods for data collection	Before and after implementation
Additional comments	

Safety Indicators

Elaborator Impact KPIs (workplan)	
Name	**3.1 Showcase for 6 months solutions for at least 14 unsafe locations (10 in urban setting and 4 in peri-urban settings) that score above 75% in user acceptance with special focus on safety perception of VRUs**
Result of the evaluation	User acceptance
Unit	%
Method selected	Questionnaires, Traffic counts
Scale of measurement	City level and experimentation level
Periods for data collection	After implementation
Additional comments	

Elaborator Impact KPIs (workplan)	
Name	3.2 Addressing safety risk for cycling and e-scooters
Result of the evaluation	Increase safety for cycling and e-scooters
Unit	%
Method selected	Traffic counts, Sensors, Public and private service database
Scale of measurement	City level and experimentation level
Periods for data collection	Before and after implementation
Additional comments	

Elaborator Impact KPIs (workplan)	
Name	3.3 Decrease of safety risks
Result of the evaluation	Decrease safety risks for cycling and e-scooters
Unit	%
Method selected	Traffic counts, Sensors, Public and private service database

Scale of measurement	City level and experimentation level
Periods for data collection	Before and after implementation
Additional comments	

Other indicators	
Name	3.9 Conflicts
Result of the evaluation	Reduction of conflicts
Unit	Number
Method selected	GPS & camera based data
Scale of measurement	City level & experimentation level
Periods for data collection	Before and after the implementation phase.
Additional comments	

Other indicators	
Name	3.11 Perceived safety
Result of the evaluation	Increase safety perception
Unit	% and/or number
Method selected	Questionnaires
Scale of measurement	City level & experimentation level
Periods for data collection	Before and after the implementation phase.
Additional comments	

Environmental Indicators

Elaborator Impact KPIs (workplan)	
Name	4.1 Increase of Zero Emission modes (All LLs)
Result of the evaluation	Increase of use of zero emission modes
Unit	%
Method selected	Questionnaires, Traffic counts

Scale of measurement	City level & experimentation level
Periods for data collection	Before and after implementation
Additional comments	

Elaborator Impact KPIs (workplan)	
Name	4.2 Reduction of emissions (All LLs)
Result of the evaluation	Reduction of emissions
Unit	%
Method selected	Air pollution sensors, Open data or Questionnaires/Traffic counts
Scale of measurement	City level
Periods for data collection	Before and after implementation
Additional comments	
Elaborator Impact KPIs (workplan)	
Name	4.5 Increase of quality-adjusted life years (All LLs)
Result of the evaluation	Uptake of active transport modes and reduction of pollution
Unit	%
Method selected	Air pollution sensors, Open data or Questionnaires/Traffic counts
Scale of measurement	City level
Periods for data collection	Before and after implementation
Additional comments	

Elaborator Impact KPIs (workplan)	
Name	4.6 Reduction in exposure to air and noise pollution (All LLs)
Result of the evaluation	Reduction in exposure to air and noise pollution (All LLs
Unit	Number
Method selected	Air pollution sensors, Open data or Questionnaires/Traffic counts
Scale of measurement	City level

Periods for data collection	Before and after implementation
Additional comments	

Social Indicators

Elaborator Impact KPIs (workplan)	
Name	5.1 Toolkits adopted and deployed (All LLs)
Result of the evaluation	Increase of bike users in the area, reduction of risks
Unit	%
Method selected	Data collection, Road data device
Scale of measurement	Experimentation level and district level
Periods for data collection	Before, during and after the implementation. Ideally starting during summer 2024.
Additional comments	

Elaborator Impact KPIs (workplan)	
Name	5.2 Focus group consultation (All LLs)
Result of the evaluation	High awareness of the focus groups
Unit	Number of participants
Method selected	Civic meetings, questionnaires, surveys
Scale of measurement	District level, city level
Periods for data collection	Before and during the implementation phase.
Additional comments	

SUMI	
Name	**5.6 Awareness level**
Result of the evaluation	High awareness level of the intervention
Unit	%
Method selected	Questionnaire, surveys, civic meetings
Scale of measurement	District and city level

Periods for data collection	Before the implementation
Additional comments	

Other indicators	
Name	**5.7 Intervention acceptance level**
Result of the evaluation	High acceptance level of the intervention
Unit	%
Method selected	Civic meetings, questionnaires, surveys
Scale of measurement	District level and city level
Periods for data collection	Before and during the implementation phase
Additional comments	

4. Data collection methods

WHAT YOU NEED TO DO NOW
For each indicator, choose the appropriate methods to collect data. Often, it is good to have both qualitative and quantitative data for an indicator so that you can get a more accurate picture. Below we provide a list of suggested qualitative and quantitative data collection methodologies. Each of them has guidelines attached. These guidelines should help collect data the right way to be used for evaluation purposes. Feel free to also choose others, these here are just suggestions. It might still be useful to look at the guidelines for our suggested methodologies, as they might be applicable for your own methodologies, too. 1. Select methodologies making sure every indicator has a method allocated. It is possible to use the same method, or the data collected for multiple indicators 2. Fill in the template “Data collection methodologies”. Copy and paste as many as you need to fill one template for each methodology

Template:

Data collection methodology

Name of the methodology	Number of users GecoAir application
Type of data collected	Download numbers
Evaluation indicators addressed	4.6 3.9
Resources and equipment needed	Communication around the app
Timeline for data collection	During the experimentation

Data collection methodology	
Name of the methodology	Evolution of the road users in the area of intervention
Type of data collected	Mobility data, bike use, car use, parts of bikes versus cars, FCD Data
Evaluation indicators addressed	1.5 2.1 2.4 2.8
Resources and equipment needed	Sensors, bike counting sensors.
Timeline for data collection	Data already partially collected in the city through sensors and work done between the city and an external provider that allows the city to have once a month a mobility dashboard indicating the number of bike users versus car users. The goal would be to develop this to have a more precise and live data that allows the city to react quickly and in an efficient manner. This will happen during the whole duration of the project.

Data collection methodology	
Name of the methodology	Evolution of modal split
Type of data collected	FCD Data, Bike use, survey, Public transport operational data

Evaluation indicators addressed	1.5 2.1 2.4 2.8
Resources and equipment needed	Sensors, bike counting sensors.
Timeline for data collection	Before, during and after the intervention

Data collection methodology	
Name of the methodology	Number of almost incidents: to reduce the number of conflicts and accidents
Type of data collected	Quantitative (camera, application) Qualitative (field study, human analysis, questionnaire)
Evaluation indicators addressed	3.1 3.2 3.3 3.9 3.11
Resources and equipment needed	Mobile app + camera + human analysis
Timeline for data collection	Data collection will start before the beginning of the experimentation and will then be pursued during the experimentation period and will be fully analyzed during the evaluation period and before the replication period in the follower city.

Data collection methodology	
Name of the methodology	Flowell
Type of data collected	Safety indicators,

Evaluation indicators addressed	3.1 3.2 3.3 3.9 3.11 1.1
Resources and equipment needed	Sensors
Timeline for data collection	During the intervention

Data collection methodology	
Name of the methodology	Travel modes detection / Road data from device
Type of data collected	Mobility data, bike use, car use, parts of bikes versus cars, FCD Data
Evaluation indicators addressed	1.5 2.1 2.4 2.8
Resources and equipment needed	camera-based detection, Application, sensors
Timeline for data collection	Before, during and after the intervention

Data collection methodology	
Name of the methodology	Public Survey / Questionnaire / Workshops
Type of data collected	
Evaluation indicators addressed	5.2 5.6 5.7
Resources and equipment needed	Meetings, surveys, communication material
Timeline for data collection	Before, during and after the intervention

Data collection methodology	
Name of the methodology	Opendata / Public database
Type of data collected	Mobility data, use per type of transport
Evaluation indicators addressed	5.1
Resources and equipment needed	Sensors, camera sensors
Timeline for data collection	Before, during and after the implementation

Data collection methodology	
Name of the methodology	Public transport operational data
Type of data collected	Use of public transport
Evaluation indicators addressed	2.4 2.8 4.1

	4.2 4.6
Resources and equipment needed	Access to the public transport operational data hosted by Ile de France Mobilités
Timeline for data collection	Before, during and after the implementation

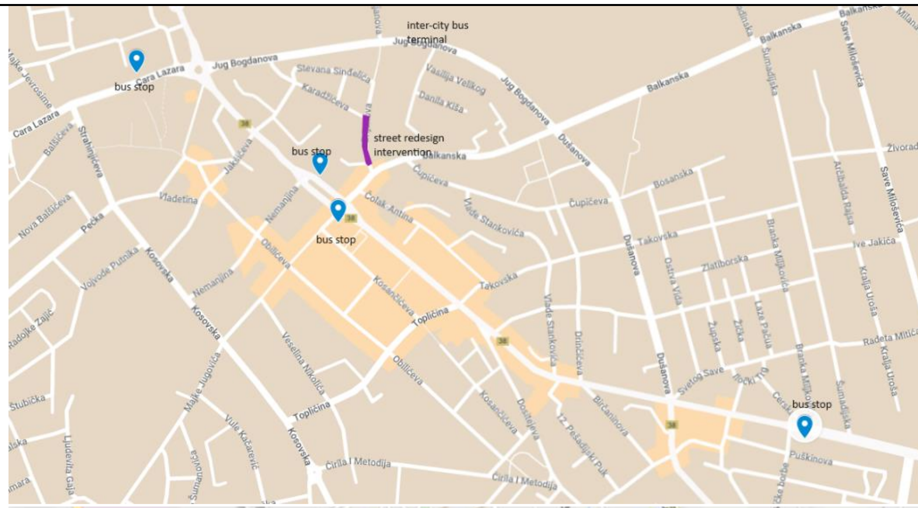
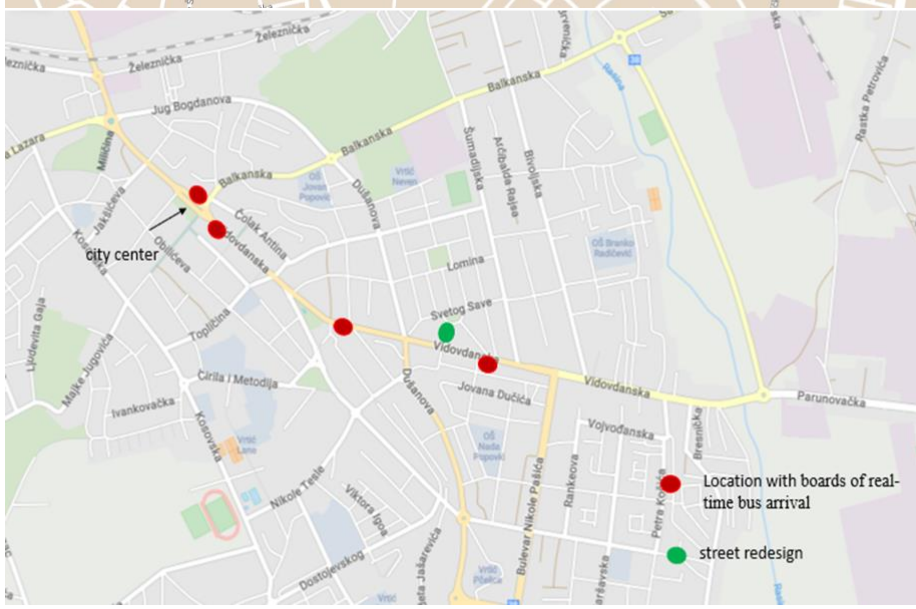
Annex X: Evaluation Plan Krusevac

1. Description of the intervention

WHAT YOU NEED TO DO NOW
Use the template to fill in the description about your intervention. Descriptions for each item in the table are found in Part 2 of the Evaluation Plan Framework.

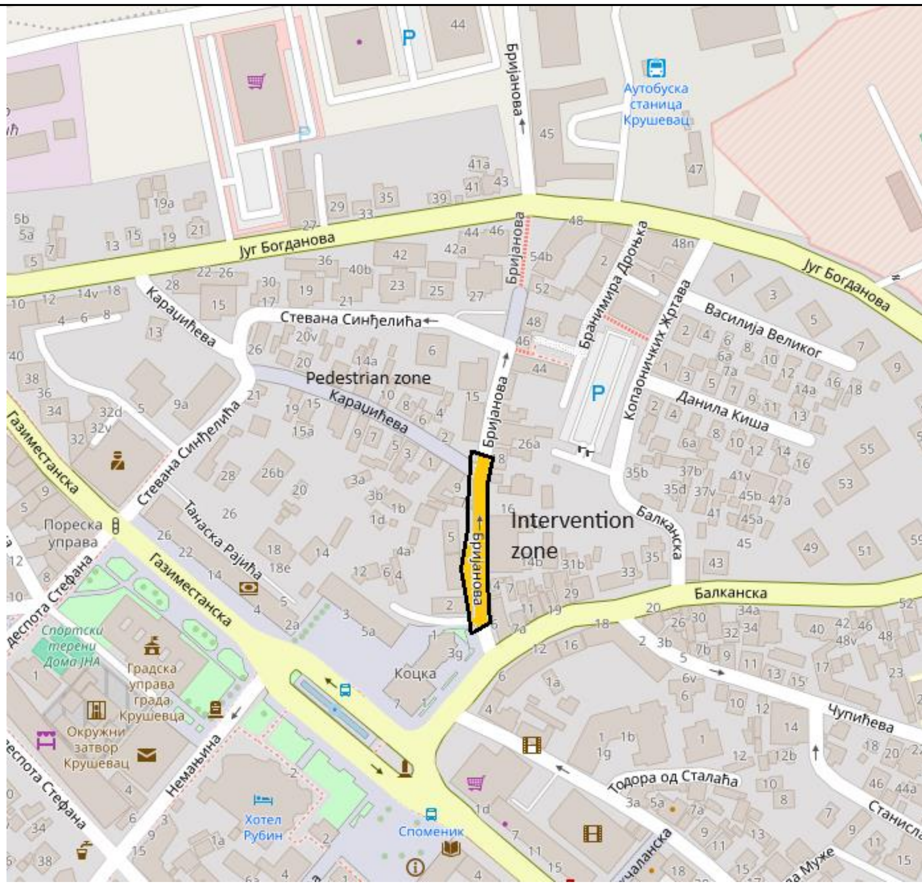
Intervention 1 description	
Overall description	Overall intervention description The proposed intervention aims to enhance the public transport system in Kruševac by implementing smart transportation solutions, including real-time bus arrival information at key bus stops and a real-time bus tracking system. This intervention is designed to increase the modal share of public transportation, which currently stands at only 14% of the total modal share in the city. Intervention aspects The key elements of the intervention include: Real-time bus arrival information at key bus stops: The installation of digital display boards at 4 strategic bus stops in the city center, where the largest number of public transport vehicles operate, to provide real-time information on bus arrivals and departures, enabling passengers to better plan their journeys and reduce waiting times. Real-time bus tracking system: The introduction of a centralized system that tracks the location and movement of buses in real-time, allowing for more efficient management and monitoring of the public transport network. On-board units in buses: The installation of onboard units in the buses to enable the real-time tracking and communication of bus location and schedule data. Central data management system: The implementation of a central system that collects, processes, and shares the real-time transportation data in an open data format, allowing for better integration and analysis of the public transport network.
Elements	
Main users	Who are the main users? The primary user groups for this intervention are:

	Passengers: The real-time bus arrival information and tracking system will significantly improve the experience and convenience for public transport users, making it easier for them to plan and navigate their journeys. Public transport operators: The centralized data management system and real-time tracking will enable the public transport operator, "Yugo Prevoz," to optimize the efficiency and responsiveness of the bus network. City authorities: The open data format and centralized system will provide city authorities with valuable insights and data to support the planning and management of the public transport system. App developers and service providers: The availability of real-time transportation data in an open format will allow for the development of innovative apps and services that can further enhance the user experience for public transport passengers.
Boundaries	Boundaries of the intervention The intervention will be implemented across the entire public transport network operated by "Yugo Prevoz" in the city of Kruševac, with a focus on 4 key bus stops located in the city center, where the largest number of public transport vehicles operate. The intervention will be in effect at all times, as the real-time bus tracking and information system is designed to provide up-to-date data to passengers and operators throughout the day and week.

Area and location	 Part od Brijanova Street, in the city center Intervention Area and Locations The intervention will be implemented across the entire public transport network operated by "Yugo Prevoz" in the city of Kruševac, with a specific focus on 4 bus stops located in the city center: the exact number of stations will be determined in co-creation with stakeholders

Intervention 2 description	
Overall description	The proposed intervention aims to redesign Brianova Street, a key pedestrian and bicycle route in the city center of Kruševac, to create a more integrated and user-friendly shared space for all modes of transportation. The current street design does not adequately meet the needs of pedestrians, and this intervention seeks to address

	this challenge by implementing traffic calming measures and prioritizing the safety and comfort of non-motorized users.
Elements	The key elements of the intervention include: Shared space design: The entire street cross-section will be redesigned as a shared space, where motorized and non-motorized users can safely co-exist and use the same surface. Traffic calming measures: Various traffic calming measures will be implemented, such as speed humps, raised crossings, and narrowed road widths, to slow down vehicle speeds and improve the safety of pedestrians and cyclists. Pedestrian infrastructure: New, wider pedestrian pathways and lowered curbs will be constructed to enhance the accessibility and connectivity for pedestrians, including vulnerable groups such as the elderly, children, and people with disabilities. Bicycle integration: Bicyclists will be able to use the entire road surface, as there will not be dedicated bicycle lanes. This integrated design will provide a more comfortable and accessible environment for cyclists of all ages and abilities. Street furniture and landscaping: The streetscape will be enhanced with the addition of street furniture, such as benches and bike racks, as well as landscaping elements like trees and planters, to create a more inviting and comfortable environment for all users. Lowering curbs and removing barriers – Vurnable road users will be able to move more easily
Main users	The primary user groups for this intervention are: Pedestrians: The intervention is designed to significantly improve the experience and safety of pedestrians, including vulnerable groups such as the elderly, children, and people with disabilities. Cyclists: The integrated shared space design will provide a more comfortable and accessible environment for cyclists of all ages and abilities. Residents and local businesses: The redesigned street will benefit the nearby residents and businesses by creating a more lively, accessible, and attractive public space. Commuters: The intervention will enhance the connectivity and accessibility for commuters, whether they are walking, cycling, or using public transportation.
Boundaries	The intervention will be implemented along Brianova Street, which is located in the city center of Kruševac, between the intercity bus station, the administrative center, and the pedestrian zone. The scope of the intervention is limited to the street itself and does not include any changes to the surrounding buildings or private properties. The intervention will be in effect at all times, as the shared space design and traffic calming measures are intended to create a safe and comfortable environment for users throughout the day and week.
Area and location	



Brianova Street is situated in the heart of Kruševac, connecting the intercity bus station, the administrative center, and the pedestrian zone. The street is approximately 500 meters long and has a current cross-section that includes two-way traffic lanes, on-street parking, and narrow sidewalks.

The living lab will focus on gathering data related to the usage and effectiveness of these interventions, as well as assessing the impact on the city's transportation infrastructure and the overall experience of residents and commuters

2. Evaluation goal

WHAT YOU NEED TO DO NOW
You will need to fill a canvas of your Theory of Change. It is the same one we used for the workshop in Issy. Those are good starting points to complete and tidy up your Theory of Change. Pictures are uploaded on Sharepoint: Pictures from workshop in Issy 1. Download and print another canvas in your office OR use is digitally by downloading it on your computer and using PDF reader to fill the boxes Impact Canvas.pdf

2. Complete all sections, ensure that everything is well connected and there are no "free flowing" items on the canvas
3. Take a picture (Do not upload it for now)
4. Fill the information into the template "Theory of Change". We highly recommend doing this after you have gone through the canvas and prioritised your project goals

Canvas

"Theory of Change", download here : Impact Canvas.pdf

Pictures from Issy Workshop: Pictures from workshop in Issy

Template

Theory of change						
Challenge	• Improving Pedestrian and Bicycle Safety • Improving Accessibility for VRU • Enhancing the Reliability and Convenience of Public Transport					
Solution 1	Short term impact		Medium term impact		Long term impact	
Traffic calming measures	Immediately improves pedestrian and cyclist safety by slowing down vehicle speeds	Immediately improves pedestrian and cyclist safety by slowing down vehicle speeds	Reduces the number of traffic-related incidents and accidents, leading to improved public health and quality of lif	Enhances the overall appeal and livability of the streetscape, attracting more commercial and community activity	Supports a long-term culture shift towards more sustainable and people-centric transportation choices	Leads to a measurable decrease in greenhouse gas emissions and air pollution as more residents opt for non-motorized modes
Solution 2	Short term impact		Medium term impact		Long term impact	
lowering curbs and removing barriers	Immediately improves accessibility and ease of movement for pedestrians, especially	Enhances the perceived inclusivity and welcoming nature of the street environment	Leads to a gradual increase in the number of pedestrians, including those from	Contributes to a more equitable and inclusive public realm, where all residents feel welcome and	Fosters a lasting culture of accessibility and inclusivity in the city's transportatio	Contributes to the city's reputation as a disability-friendly and age-friendly destination, attracting

	those with mobility challenges, strollers, or wheelchair		vulnerable groups, using the street	able to access the city's amenities Supports the overall goals of improving public health and quality of life by promoting active lifestyles	n planning and urban design. Serves as a model for other cities to follow in creating truly inclusive and accessible public spaces	new residents and visitors
Solution 3	Short term impact		Medium term impact		Long term impact	
Real-time bus tracking system	improves the convenience and user experience for public transport passengers, who can now better plan their journeys	Enhances the reliability and responsiveness of the bus network, leading to increased customer satisfaction	Contributes to a gradual increase in the modal share of public transport as more residents choose to use the bus system	Supports the integration of public transport with other sustainable mobility options, such as walking and cycling	Fosters a lasting culture of sustainable and multimodal mobility, where public transport is seen as a reliable and attractive transportation option	Supports the city's broader goals of reducing carbon emissions and promoting environmentally-friendly transportation choices
Vision	The city of Kruševac is committed to transforming its urban landscape and transportation system to prioritize sustainable mobility and ensure accessibility for all residents and visitors. Through a comprehensive approach to urban planning and infrastructure development, the city aims to create an integrated, user-friendly, and inclusive mobility network that caters to the diverse needs of its community.					

3. Evaluation indicators

WHAT YOU NEED TO DO NOW
Pick the indicators for your project. For the impact KPIs, looks which ones are relevant for your city and see which element of your intervention is best suited in measuring this data. If there is a mandatory KPI but you don't have an impact that matched that outcome, you might need to consider adding elements to your solution that will create that impact. And it is always good to talk to the project management about this:

Jason (ICCS), Hans (Technical manager), Monica & James (WP7 leaders) 1. Identify indicators and write them next to the impact on your canvas 2. If you have KPIs that are mandatory for your city but no impact to address them, you will need to return to the previous step and add elements to your intervention that will enable you to achieve those outcomes of the KPIs 3. If you are very unsure on how to address this KPIs, please reach out to the project management team with contacts listed above 4. For the SUMIs, make sure to pick at least one per evaluation area 5. Outside of that, pick as many indicators as you think is useful. Keep in mind that you will need to evaluate the impact of your intervention in WP7, so the more indicators and data you collect, the more secure is a successful evaluation in the end 6. Every indicator has a fully detailed description provided in the Annex 7. Feel free to think of other indicators not part of the provided list. Please use the "light blue" template when describing them 8. Once you have decided on the indicators, will the template "Evaluation indicator". Copy past as many templates as you need and fill one template for each indicator, including the KPIs. Make sure to keep the headers colour coded: - dark blue = impact KPIs - light purple = SUMI - light blue = Other indicators 9. Take a second picture of the canvas (including the indicators) and upload it into the indicated area on your City Plan

Templates:

Elaborator Impact KPIs	
Name	
Result of the evaluation	
Unit	
Method selected	
Scale of measurement	
Periods for data collection	
Additional comments	

City of Kruševac indicators for interventions

2.1 Reduction of private car use	
Outcome 1	
There needs to be evidence that the intervention in the LL has contributed to reduced car use.	
Unit	%
City relevant	
How: Measure result	Reduced car use: Measuring the traffic in a selected representative area in the LL. A representative area will be the one with the heaviest traffic flow. It should be an area where the solution is being implemented so you can test the results before and after. It must be clearly identified that those cars are private cars.
Frequency	Before and after implementation
Collection methods	Parking counts, Counting sensors and speed/traffic management
Target	Min of 10% reduction
Project management relevant	
Project-wide targets	In all Living Labs: Min. 10% reduction of the use of private cars **All LLs**
Cities contributing	
Cities not decided yet	

1.7 Quality of public spaces	
Quality of public area, presence in the city of streets and squares that offer sociability and a good image.	
Unit	% (% of satisfaction)
City relevant	
How: Measure result	The indicator can be measured by conducting a survey based on the following question & answers: • "Generally speaking, please tell me if you are satisfied, rather satisfied, rather unsatisfied, not at all satisfied, or don't know/not Applicable, with each of the following issues in your city or area:

	○ Public spaces such as markets, squares, pedestrian areas ○ Green spaces such as parks and gardens". • Indicate the number of respondents for each answer (satisfied, rather satisfied, rather unsatisfied, not at all satisfied, or don't) • Calculate the weighted average to obtain the perceived satisfaction of public spaces $\overline{SAT} = \frac{\sum_m \overline{ASPECT_m}}{m}$ m being the number of asp $\overline{ASPECT_m} = \sum_h \overline{AGREE_{h,m}}$ h being the four replies o $(strongly\ agree, somewhat\ agree, somewhat\ disagr$ $\overline{AGREE_{h,m}} = \frac{\#times\ agreement\ h\ was\ used\ in\ sam}{\#people\ sample\ of\ aspect\ m - \# \frac{DK}{NA} an}$ $C_{h=strongly\ agree} = 10;\ C_{h=somewhat\ agree} = 6.66;\ C_{h=}$ $C_{h=strongly\ disagree} = 0$
Frequency	Once, to rate the perceived satisfaction. To measure improvement: before and after implementation
Collection methods	two surveys will be conducted. The first survey before the intervention, the second survey after the intervention
Sources	SUMI 14

5.3 Satisfaction with public transport

<table>
<tr><td colspan="2">This indicator measures the satisfaction of the population in relation to public transport.

It has been designed to analyse results from the European Commission's Urban Audit, a perception survey on quality of life in European cities which is being conducted by Eurostat based on telephone interviews on a regular basis. The parameter is an averaged score of survey responses about a respondent's perception of satisfaction of using public transport.</td></tr>
<tr><td>Unit</td><td></td></tr>
<tr><td colspan="2">City relevant</td></tr>
<tr><td>How: Measure result</td><td>The average reported satisfaction of moving in the urban area by public transport.

1) Generally speaking, please tell me if you are [1] satisfied, [2] rather satisfied, [3] rather unsatisfied, [4] not at all satisfied, or [5] don't know/ not applicable (do not read out), with public transport (for example the bus, tram or metro) in your city or area.

2) Thinking about public transport in your city, based on your experience or perceptions, please tell me whether you strongly agree, somewhat agree, somewhat disagree, strongly disagree, or DK/NA (do not read out), with each of these statements.

Public transport in your city is:
• Affordable
• Safe
• Easy to get
• Frequent (comes often)
• Reliable (comes when it says it will)</td></tr>
</table>

	$\overline{SAT} = \frac{\sum_m \overline{ASPECT}_m}{m}$ m being the number of asp $\overline{ASPECT}_m = \sum_h \overline{AGREE}_{h,m}$ h being the four replies o (strongly agree, somewhat agree, somewhat disag $\overline{AGREE}_{h,m} = \frac{\#times\ agreement\ h\ was\ used\ in\ sam}{\#people\ sample\ of\ aspect\ m - \#\frac{DK}{NA} an}$ $C_{h=strongly\ agree} = 10;\ C_{h=somewhat\ agree} = 6.66;\ C_{h=}$ $C_{h=strongly\ disagree} = 0$
Where: Scale	Bus stops within intervention area.
Frequency	before and after the interventions have been installed
Collection methods	• two small surveys will be conducted. The first survey before the intervention, the second survey after the intervention • The survey method used should use criteria for reaching a representative sample of the population. • There are three options for getting the data to calculate this indicator 1) Check whether your city has been part of the EC's Urban Audit in 2019 or 2015. The list of cities is included in the results from the surveys ("Eurobarometer Flash") 2) Your city collects the necessary data for this indicator by conducting a small survey using the same questions. This could also be integrated into a larger survey. The questions can be embedded in existing transport, social attitudes or other panel surveys to minimise costs, maximise sample size and reduce the risk of survey bias

	3) Use the data from a survey on satisfaction with public transport that has already been conducted in your city. Most often, the city's public transport operator conducts such surveys with their passengers on a regular basis.
Target	Public transport users
Sources	SUMI 12
Reference	

2.4 5% increase of desired modal split	
Outcome 6	
We are aiming for an increase in the use of active mobility modes of transport.	
Unit	%
City relevant	
How: Measure result	Active mobility modes: Cycling, walking, skating, e-scooters. To calculate the increase, we need data from before and after the implementation of the intervention. **Changes of modal split.** Collect data about use or expected use (by measuring user acceptance) of active mobility modes. Calculate how the percentage of modes of transport are changing. Modal split can be also measured according to the number of trips ran by modes of transport. Calculate: total number of transport mode kilometers ran for each mode within an urban area compared to the total number of transport kilometers ran for all modes within an urban area.
Where: Scale	LL
Frequency	Before and after implementation
Collection methods	Counting sensors and speed/traffic management
Target	Min 1 service
Project management relevant	

Project-wide target	Min 5% increase of modal shift toward desired active mode of transport in LL areas **All LLs**
Cities contributing	
Cities not decided yet	
Sources	Civitas SUMI "Modal Split"

3.3 Decrease of safety risks	
Outcome 5	
Cities need to show how their interventions are expected to actively contribute to reducing safety risks. This is more a general indicator, it could be looking at safety for pedestrians, cyclists or VRUs, it's up to the city to define their safety impact.	
Unit	%
City relevant	
How: Measure result	In this KPI, it is important to show how interventions are expected to contribute to a decrease of safety risks. This can be measured using qualitative data, e.g. by asking for people's perception of safety. Safety risks affected by changes in infrastructure or mobility services can also be estimated using simulation tools. To quantify some of the qualitative data, you need to use the safety rating system for "Safety". The rating system also explains how to compare the measurements at different times – before and after the intervention. There are many indicators in the sections "SUMIs" and "Other indicators" that explain how to measure safety with different types of data. Longterm, cities should continue to collect data on the risk of safety.
Frequency	Before and after the implementation

Collection methods	Survey, police reports
Target	At least one area in your LL has proven a decrease of risk due to the intervention
Project management relevant	
Project-wide target	Original name: No. of LLs to decrease expected safety risk **All LLs**
Cities contributing	
Cities not decided yet	
Sources	
Reference	SUMIS and Other indicators: Evaluation Area "Safety"

4.1 Increase of use of zero emission modes	
Outcome 1	
Use of transport should increase amongst the modes of transport that reduce the air pollution in the LL. This can be for example cycling, walking, e-scooter, public transport etc. Here it will be not necessary to measure the reduction in air pollution, but the increase of use for services that contribute	
Unit	%
City relevant	
How: Measure result	Measure use of mobility: This can be done by comparing the modal split before and after the intervention. It will need to be clear how the intervention increases people's accessibility, ability, motivation and security in using zero emission modes. We will need to see that there is a measurable impact on the uptake of those means of transport by comparing the situation before and after the implementation of the intervention. For this, select a representative area within the LL where you can collect the data over time. **Count the number of people using zero emission modes of transport:** Option 1: Modal split according to passenger kilometres ran: total number of passenger kilometres ran for each mode within an urban area

	compared to the total number of passenger kilometres ran for all modes within an urban area. Option 2: Modal split according to number of trips: total number of trips for each mode within an urban area compared to the total number of trips for all modes within an urban area. Make sure to collect information on the types of transport used, so it can be very clear that these are zero emission modes. **Rate satisfaction with infrastructure:** Good quality means that the streets meets at least one of the following requirements: • good bike lanes (minimum 1.5 meters one-way and 2.5 meters two ways) • a 30 km/h (or 20 mph) speed regime or below • car free • dedicated paths and links of at least 50m in length that are off-street
Frequency	Before and after implementation
Collection methods	Survey, Counting sensors and speed/traffic management
Target	Min of 5% increase
Project management relevant	
Project-wide target	Original name: In all Living Labs: Min. 5% increase in use of zero-emission modes as means of transportation (e.g., biking, walking, etc.) **All LLs**
Cities contributing	
Cities not decided yet	
Sources	Civitas SUMI “Modal Split”, Civitas evaluation framework key indicator no. 14

4.2 Reduction of emissions
Outcome 1

Carbon dioxide emission reductions from the use of energy could be achieved by fuel conversion, increased efficiency, reducing energy demand and increased use of non-fossil energy sources. There needs to be an estimated 10% reduction of emission in LLs. It will need to be estimated as it will likely not be possible for cities to achieve that aim using this test bed of the LL. What needs to be evident is a development through the intervention that, at scale, will lead to the targeted reduction of emissions. This can be defined by observing the shift of modes of transport that will reduce air pollution at scale, by people's satisfaction with the changes of the intervention.	
Unit	%
City relevant	
How: Measure result	Measure use of mobility: This can be done by comparing the modal split before and after the intervention. We will need to see that there is a measurable impact on the uptake of those means of transport by comparing the situation before and after the implementation of the intervention. For this, select a representative area within the LL where you can collect the data over time. Secondly, working with users and collecting data about their opinions and satisfaction with the intervention. Looking at overall parameters such as the perception of safety, the increase of accessibility for users from diverse groups. Lastly, you can also measure emissions in the air by using technology. **Count the number of people using zero emission modes of transport:** Option 1: Modal split according to passenger kilometres ran: total number of passenger kilometres ran for each mode within an urban area compared to the total number of passenger kilometres ran for all modes within an urban area. Option 2: Modal split according to number of trips: total number of trips for each mode within an urban area compared to the total number of trips for all modes within an urban area. **Measure the satisfaction of users:** User/provider/stakeholder average reported satisfaction with • the overall quality of the transport system (public transport, cycling, walking, etc.)

	• the quality of a specific service It measures the experience of the user/provider, against its expectations. Unit: % of shares with a qualitative score (1-5) of the perception of quality **Measure emissions:** CO2 emissions is defined as the average CO2 emissions per vehicle-km by vehicle and fuel types or by city resident/system user Unit: g/vkm or tonnes of CO2 Vehicles: car, bus, lorry, tram, metro. For road vehicles, vehicle split should be based on the COPERT category. Fuels: petrol, diesel, electricity, liquefied petroleum gas (LPG), natural gas, alcohol mixtures, hydrogen and bio-fuels CO2 emissions can be measured by many methods including field trials or modelling.
Frequency	Before and after implementation
Collection methods	Survey, Counting sensors and speed/traffic management, co2 and air pollution sensors, modeled based on traffic counts
Target	Min of estimated 10% decrease
Project management relevant	
Project-wide target	Original name: In all Living Labs: Min. 10% estimated reduction of emissions **All LLs**
Cities contributing	
Cities not decided yet	
Sources	Civitas SUMI "Modal Split", SUMI "User satisfaction", Civitas evaluation framework key indicator no 24

4.5 Increase of quality-adjusted life years
Outcome 6

This impact is expected to be generated by an uptake of active transport modes. That shift will increase the air quality and therefore improve the overall health of citizens. This is a long term impact and will be difficult to measure in such a short time frame and limited scale of the LLs. What will be important is to look at the intention's cities aim for to increase the use of active modes of transport which will then reduce air pollution.	
Unit	%
City relevant	
How: Measure result	**Measure uptake** in active and zero emission mobility modes. Please refer to impact KPI 6.2 "Increase of desired modal split" for more information on how to measure this. **To measure improved air quality** and health outcomes long term (after ELABORATOR is finished) it is also possible to collect data on emissions and air pollutants. For that, cities can use sensors to collect information about the emissions in the air. Furthermore, they can sue counting sensors to check a long-term development of decreasing air polluting modes of transport.
Frequency	Before and after implementation
Collection methods	CO2 sensors and air pollution sensors
Target	
Project management relevant	
Project-wide target	Original name: No. of LLs increase estimated no. of quality-adjusted life years due to uptake of active modes and changes in air quality resulting from intervention **All LLs**
Cities contributing	
Cities not decided yet	
Sources	Civitas SUMIs "Modal Split", "Air pollutant emissions for DG MOVE", "GHG Emissions for DG MOVE"

4.6 Reduction in exposure to air and noise pollution
Outcome 3
The scaling of the solutions is expected to reduce the road user's exposure to air and noise pollution by 10% min. What is important to show a clear link between the intervention and the aimed outcomes. It

will be unlikely possible for cities to show data of the achieved aim, but measured data of the test results should point into that direction.	
Unit	Number
City relevant	
How: Measure result	It is important to collect data around air and noise pollution before the implementation. This will enable cities to calculate a % in reduction. For the reduction in air pollution, there are several options. To use sensors and collect data about air pollutants would be a good baseline data to have, but will be unlikely to prove any reduction after the small scale interventions. Although it will be useful for measuring again after the solution has scaled. More proxy measures are needed to indicate a shift and suggested trend. - Cities can estimate the reduction by looking at the reduction in traffic. - They can look at an increase of modal split around active modes of transport (walking, cycling etc.) In terms of qualitative data, it is possible to collect feedback from mobility users of the relevant areas. This can be - Perception of change in air or noise pollution - User satisfaction around safety and accessibility for active modes of transport
Where: Scale	LL
Frequency	Before and after implementation
Collection methods	CO_2 sensors and air pollution sensors Sound Level Meter
Target	10 % reduction
Project management relevant	
Project-wide target	Original name: Scaling up and assessment of the showcased solutions for the 12 LLs will result in increased estimation 10% as regards reduction in exposure to air and noise pollution **All LLs**
Cities contributing	
Cities not decided yet	

Sources	
Reference	Civitas SUMIs “Modal Split”, “Air pollutant emissions”, “Noise”, “Quality of public spaces”

5.1 Toolkit adoptation and deployment	
Elaborator Outcomes 2 and 3	
One of the aims of the project is to collect and share rich information sets made of real data, traces from dedicated toolkits, users’ and stakeholders’ opinions among the cities, so as to increase the take up of the innovations via a twinning approach. Therefore, the adoption and deployment of the technological toolkits is key to achieve this goal, since they serve as instruments for active participation, data platform, and visualization tools.	
Unit	Number of toolkits adopted and deployed
How: Measure result	For cities to contribute to this KPI, they should clearly show they have used at least one toolkit and described it in the following 3 stages: 1. Before: explain the purpose in using the selected toolkit and, its relationship with the intervention. 2. During: show evidence of the usage of the toolkit, where and how it is used. 3. After: show the results obtained and its usage for active participation, data platform, and visualization tool.
Where: Scale	Intervention scale
Frequency	During the project
Target	At least 1 toolkit deployed
Project management relevant	
Project wide target	Original name: No. of new cities to adopt toolkits for active participation, data platform and visualization tool (min. 10); 12 participant cities and at least 5 Observer or new cities will deploy the technological toolkits for active citizens participation, data platform and visualization tool. **Min: 12 participant cities and at least 5 Observer or new cities.**
Cities contributing	
Cities not decided yet	
Sources	Elaborator DoA - Outcome indicators.

Elaborator Impact KPIs	
Name	5.2 Focus group consultation
Result of the evaluation	
Unit	Number of focus groups (approx. 4)
Method selected	2.3 Semi-structured interviews with VRUs or representative, 2 Workshops with VRUs and stakeholders.
Scale of measurement	LL
Periods for data collection	During 2025 - immediately after implementation of intervention (short term impacts), During 2026 - medium term impacts
Additional comments	Data before interventions on focus group's mobility needs etc. draws on existing surveys, explorations and evaluations. Hence, no direct consultancy activities will be needed.

4. Data collection methods

WHAT YOU NEED TO DO NOW
For each indicator, choose the appropriate methods to collect data. Often, it is good to have both qualitative and quantitative data for an indicator so that you can get a more accurate picture. Below we provide a list of suggested qualitative and quantitative data collection methodologies. Each of them has guidelines attached. These guidelines should help collect data the right way to be used for evaluation purposes. Feel free to also choose others, these here are just suggestions. It might still be useful to look at the guidelines for our suggested methodologies, as they might be applicable for your own methodologies, too. 1. Select methodologies making sure every indicator has a method allocated. It is possible to use the same method, or the data collected for multiple indicators 2. Fill in the template "Data collection methodologies". Copy and paste as many as you need to fill one template for each methodology

Template:

Data collection methodology	
Name of the methodology	Public Spaces Satisfaction Survey
Type of data collected	Perception and satisfaction data from residents and users regarding redesigned road in project's intervantion
Evaluation indicators addressed	1.7 Quality of public spaces
Resources and equipment needed	• Survey questionnaires (paper or digital) • Tablets or mobile devices for digital data collection (if applicable) • Data entry and analysis software (e.g., Excel, SPSS, or specialized survey analysis tools) • Human resources for survey administration, data entry, and analysis
Timeline for data collection	Pre-intervention survey: • Conduct the survey at least 2-4 weeks before the implementation of the interventions related to public spaces. • Allow 2-4 weeks for data collection, depending on the sample size and survey method. Post-intervention survey: • Conduct the survey approximately 1-2 months after the interventions have been implemented and fully operational. • Allow 2-4 weeks for data collection, similar to the pre-intervention survey.

Data collection methodology	
Name of the methodology	Public Transport Satisfaction Survey
Type of data collected	Perception and satisfaction data from residents and users regarding the public transport system, including aspects such as affordability, safety, accessibility, frequency, and reliability
Evaluation indicators addressed	5.3 Satisfaction with public transport
Resources and equipment needed	• Survey questionnaires (paper or digital) • Tablets or mobile devices for digital data collection (if applicable) • Data entry and analysis software (e.g., Excel, SPSS, or specialized survey analysis tools) • Human resources for survey administration, data entry, and analysis
Timeline for data collection	Pre-intervention survey: • Conduct the survey at least 2-4 weeks before the implementation of the interventions related to public transport. • Allow 2-4 weeks for data collection, depending on the sample size and survey method. Post-intervention survey: • Conduct the survey approximately 1-2 months after the interventions have been implemented and fully operational. • Allow 2-4 weeks for data collection, similar to the pre-intervention survey.

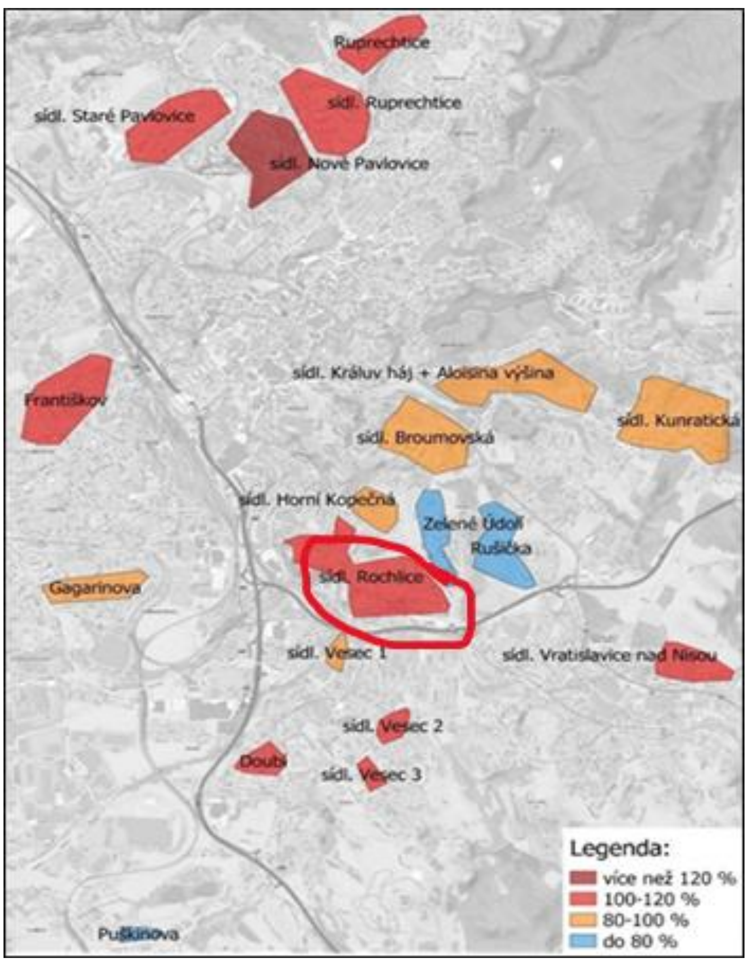
Annex XI: Evaluation Plan Liberec

1. Description of the intervention

WHAT YOU NEED TO DO NOW
Use the template to fill in the description about your intervention. Descriptions for each item in the table are found in Part 2 of the Evaluation Plan Framework.

Intervention description	
Overall description	Rochlice (Dobiasova) is densely populated locality, where there is typical higher traffic intensity, since the concerned locality is housing estate, there are located relevant civic amenities as shops, kindergarten, school, etc.). This has negative inffluence on traffic intensity and safety, this is why there has been realised some measures leading to increase in traffic safety (crossings reconstruction, pavements reconstructions, public lighting modernisation. It is also necessary to continue with other measures leading to increase in transport safety and development/support of sustainable mobility. The problem of the area is parking in the housing estate (see picture above), the insufficient capacity of parking places, also the possibility of unsafe coexistence between other traffic participants as bikes, scooters, motorbikes, public transport etc.). There is also completely missing infrastructure for electromobility development.
Elements	Infrastructure targeted: parking spaces/spots in housing estates (New) Services: yes, services/instruments regulating parking in housing estates (it means appropriate technical instruments for vehicle detection, active or passive sensors, overall service relevant to issuing cards) Monitoring needed: yes, it will be ensured with the use of ITS systems (sensors) - vehicle plates detection, based on inspection of turnover and occupancy of parking spaces etc.
Main users	Citizens, residents
Boundaries	Area of the housing estate
Area and location	


ROCHLICE
Dobiášova
Ješkova
Burianova
Na Žižkově
Dr. Milady Horákové
V Háji
Žitná
Červeného
Boleslavova
Rybniční
Pazderkova
Seifertova
Nádvorní
Hradební
14


Ruprechtice
sídl. Ruprechtice
sídl. Staré Pavlovice
sídl. Nové Pavlovice
Františkov
sídl. Králův háj + Aloisina výšina
sídl. Broumovská
sídl. Kunratická
sídl. Horní Kopečná
Zelené Údolí
Rušička
sídl. Rochlice
Gagarinova
sídl. Vesec 1
sídl. Vratislavice nad Nisou
sídl. Vesec 2
Doubí
sídl. Vesec 3
Puškinova
Legenda:
více než 120 %
100-120 %
80-100 %
do 80 %
1.

2. Evaluation goal

WHAT YOU NEED TO DO NOW
You will need to fill a canvas of your Theory of Change. It is the same one we used for the workshop in Issy. Those are good starting points to complete and tidy up your Theory of Change. Pictures are uploaded on Sharepoint: Pictures from workshop in Issy 1. Download and print another canvas in your office OR use is digitally by downloading it on your computer and using PDF reader to fill the boxes Impact Canvas.pdf 2. Complete all sections, ensure that everything is well connected and there are no "free flowing" items on the canvas 3. Take a picture (Do not upload it for now) 4. Fill the information into the template "Theory of Change". We highly recommend doing this after you have gone through the canvas and prioritised your project goals

Canvas

"Theory of Change", download here : Impact Canvas.pdf

Pictures from Issy Workshop: Pictures from workshop in Issy

Done

Template

Theory of change						
Challenge	• Bullet points					
Solution 1	Short term impact		Medium term impact		Long term impact	
Effective regulation of parking in housing estates	Acceptance of the solution by citizens/residents	Distribution of traffic information	Less number of trips in housing estates		Traffic efficiency	Air pollution/GHG emissions decrease
Solution 2	Short term impact		Medium term impact		Long term impact	
Support/development of electrification in terms of	Negative feedbacks	E-mobility improvements	Less number of trips in housing estates		Traffic safety	Higher share of active mobility in modal split

charging infrastructure development in housing estates						
Solution 3	Short term impact		Medium term impact		Long term impact	
Public space redesign	Acceptance of the solution by citizens/residents				Public spaces redesign	Citizens health improvement
Vision	Proposed interventions lead to increase of serviseability of housing estate, increase in traffic safety, increase in quality of air, quality of public space in housing estates etc., since there will be some changes in terms of regulation (monitoring), public space re-design and new infrastructure leading to decrease of number of trips in housing estates when parking, increase in electrification and increase in sustainable ways of mobility.					

3. Evaluation indicators

WHAT YOU NEED TO DO NOW

Pick the indicators for your project. For the impact KPIs, looks which ones are relevant for your city and see which element of your intervention is best suited in measuring this data. If there is a mandatory KPI but you don't have an impact that matched that outcome, you might need to consider adding elements to your solution that will create that impact. And it is always good to talk to the project management about this:
Jason (ICCS), Hans (Technical manager), Monica & James (WP7 leaders)

1. Identify indicators and write them next to the impact on your canvas
2. If you have KPIs that are mandatory for your city but no impact to address them, you will need to return to the previous step and add elements to your intervention that will enable you to achieve those outcomes of the KPIs
3. If you are very unsure on how to address this KPIs, please reach out to the project management team with contacts listed above
4. For the SUMIs, make sure to pick at least one per evaluation area
5. Outside of that, pick as many indicators as you think is useful. Keep in mind that you will need to evaluate the impact of your intervention in WP7, so the more indicators and data you collect, the more secure is a successful evaluation in the end
6. Every indicator has a fully detailed description provided in the Annex
7. Feel free to think of other indicators not part of the provided list. Please use the "light blue" template when describing them
8. Once you have decided on the indicators, will the template "Evaluation indicator". Copy past as many templates as you need and fill one template for each indicator, including the KPIs. Make sure to keep the headers colour coded:

- dark blue = impact KPIs
- light purple = SUMI
- light blue = Other indicators

9. Take a second picture of the canvas (including the indicators) and upload it into the indicated area on your City Plan

Templates:

Elaborator Impact KPIs (workplan)	
Name	**2.1 Reduction of private car use**
Result of the evaluation	
Unit	%
Method selected	Survey, Public database
Scale of measurement	
Periods for data collection	Before and after implementation
Additional comments	
Elaborator Impact KPIs (workplan)	
Name	**2.4 % increase of desired modal split**
Result of the evaluation	
Unit	%
Method selected	Survey, Road data from controlled intersection
Scale of measurement	
Periods for data collection	Before and after implementation
Additional comments	
Elaborator Impact KPIs (workplan)	
Name	**3.3 Decrease of safety risks**
Result of the evaluation	
Unit	%
Method selected	Police database from accidents
Scale of measurement	
Periods for data collection	Before and after the implementation
Additional comments	
Elaborator Impact KPIs (workplan)	
Name	**4.1 Increase of use of zero emission modes**

Result of the evaluation	
Unit	%
Method selected	Survey
Scale of measurement	
Periods for data collection	Before and after implementation
Additional comments	
Elaborator Impact KPIs (workplan)	
Name	**4.2 Reduction of emissions**
Result of the evaluation	
Unit	%
Method selected	CO2 sensors, air quality sensors
Scale of measurement	
Periods for data collection	Before and after implementation
Additional comments	
Elaborator Impact KPIs (workplan)	
Name	**4.3 Reduction in exposure to air and noise pollution**
Result of the evaluation	
Unit	Number, %
Method selected	CO2 sensors, air quality sensors
Scale of measurement	
Periods for data collection	Before and after implementation
Additional comments	
Elaborator Impact KPIs (workplan)	
Name	**4.4 Climate city contracts supported**
Result of the evaluation	
Unit	Number
Method selected	Mission label obtained
Scale of measurement	
Periods for data collection	After implementation
Additional comments	

Elaborator Impact KPIs (workplan)	
Name	**4.6 Increased of quality-adjusted life years**
Result of the evaluation	

Unit	%
Method selected	Survey
Scale of measurement	
Periods for data collection	Before and after implementation
Additional comments	
Elaborator Impact KPIs (workplan)	
Name	**5.1 Toolkits adopted and deployed**
Result of the evaluation	
Unit	Number of toolkits adopted and deployed
Method selected	Parking counts, Camera based
Scale of measurement	
Periods for data collection	
Additional comments	
Elaborator Impact KPIs (workplan)	
Name	**5.2 Focus group consultation**
Result of the evaluation	
Unit	Number of focus groups
Method selected	Workshops, Civic meetings
Scale of measurement	Number
Periods for data collection	
Additional comments	

SUM indicator	
Name	**1.7 Quality of public spaces**
Result of the evaluation	
Unit	The perceived satisfaction of public spaces.
Method selected	Civic meetings, Questionnare
Scale of measurement	
Periods for data collection	
Additional comments	
SUM indicator	
Name	**3.6 Road deaths**
Result of the evaluation	
Unit	Number per year in a selected area
Method selected	Police database
Scale of measurement	Number

Periods for data collection	Yearly
Additional comments	
SUM indicator	
Name	**4.10 Air pollutant emissions**
Result of the evaluation	
Unit	
Method selected	CO2 sensors, air quality sensors
Scale of measurement	
Periods for data collection	
Additional comments	
SUM indicator	
Name	**4.11 Energy efficiency**
Result of the evaluation	
Unit	Number of charging points
Method selected	Public database
Scale of measurement	
Periods for data collection	After implementation
Additional comments	
SUM indicator	
Name	**5.3 Satisfaction with public transport**
Result of the evaluation	
Unit	%
Method selected	Survey
Scale of measurement	
Periods for data collection	After 5 years
Additional comments	

Another indicator	
Name	**5.7 Intervention acceptance level**
Result of the evaluation	
Unit	%
Method selected	Civic meeting, questionnare
Scale of measurement	
Periods for data collection	After implementation
Additional comments	

4. Data collection methods

WHAT YOU NEED TO DO NOW
For each indicator, choose the appropriate methods to collect data. Often, it is good to have both qualitative and quantitative data for an indicator so that you can get a more accurate picture. Below we provide a list of suggested qualitative and quantitative data collection methodologies. Each of them has guidelines attached. These guidelines should help collect data the right way to be used for evaluation purposes. Feel free to also choose others, these here are just suggestions. It might still be useful to look at the guidelines for our suggested methodologies, as they might be applicable for your own methodologies, too. 1. Select methodologies making sure every indicator has a method allocated. It is possible to use the same method, or the data collected for multiple indicators 2. Fill in the template "Data collection methodologies". Copy and paste as many as you need to fill one template for each methodology

Template:

Data collection methodology	
Name of the methodology	**Public/Private Services database**
Type of data collected	Statistical data
Evaluation indicators addressed	3.3 Decrease of safety risks, road deaths
Resources and equipment needed	Police database
Timeline for data collection	Before and after implementation

Data collection methodology	
Name of the methodology	**Parking counts**
Type of data collected	– Occupancy of parking lots, – parking time, – vehicle turnover rate
Evaluation indicators addressed	5.1 Toolkits adopted and deployed
Resources and equipment needed	Using detectors that are attached to road
Timeline for data collection	After implementation

Data collection methodology	
Name of the methodology	Civic meetings
Type of data collected	Subjective opinion
Evaluation indicators addressed	5.2 Focus group consultation
Resources and equipment needed	
Timeline for data collection	During implementation

Data collection methodology	
Name of the methodology	Civic meetings, Questionnaire
Type of data collected	Subjective opinions and answers
Evaluation indicators addressed	1.7 Quality of public spaces, 5.7 Intervention acceptance level
Resources and equipment needed	
Timeline for data collection	During and after implementation

Data collection methodology	
Name of the methodology	CO2 sensors, air quality sensors
Type of data collected	– Level of CO2 – Lever of air pollutants
Evaluation indicators addressed	4.10 Air pollutant emissions
Resources and equipment needed	Air quality meters, database of CHMU
Timeline for data collection	Before and after implementation

Data collection methodology	
Name of the methodology	Public transport operational data, Survey
Type of data collected	Open data

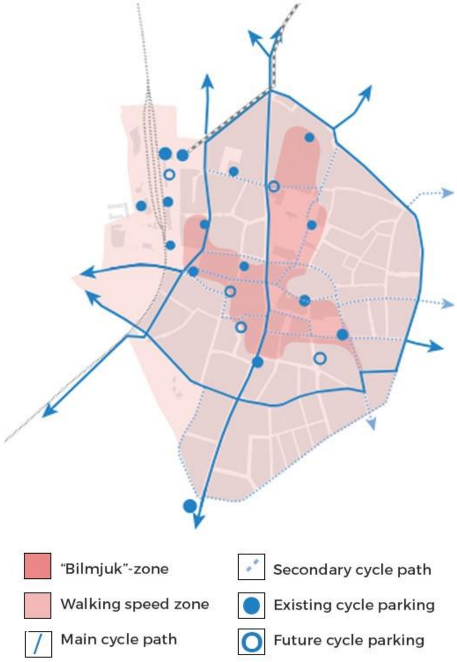
Evaluation indicators addressed	5.3 Satisfaction with public transport
Resources and equipment needed	
Timeline for data collection	After implementation

Annex XII: Evaluation Plan Lund

1. Description of the intervention

WHAT YOU NEED TO DO NOW
Use the template to fill in the description about your intervention. Descriptions for each item in the table are found in Part 2 of the Evaluation Plan Framework.

Intervention description	
Overall description	Temporary redesigning public space/street
Elements	The area offers easy access for cars in to the city center and parking, both short-term and longer-term parking. The street is also an important path for cyclist and pedestrians, commuting and trips to the nearby schools. Along the street there is several shops and restaurants. On the square there is a market during weekdays and Saturdays. (daytime)
Main users	Car users, pedestrian, cyclist, market
Boundaries	Not hinder the busses on nearby streets, narrow streets and public space in city center
Area and location	Yellow area (see picture below)

	  *Plan for introducing new zones in the city center to promote a safer and inclusive environment for all sustainable transport modes.*

2. Evaluation goal

WHAT YOU NEED TO DO NOW
You will need to fill a canvas of your Theory of Change. It is the same one we used for the workshop in Issy. Those are good starting points to complete and tidy up your Theory of Change. Pictures are uploaded on Sharepoint: Pictures from workshop in Issy 1. Download and print another canvas in your office OR use is digitally by downloading it on your computer and using PDF reader to fill the boxes Impact Canvas.pdf 2. Complete all sections, ensure that everything is well connected and there are no “free flowing” items on the canvas 3. Take a picture (Do not upload it for now) 4. Fill the information into the template “Theory of Change”. We highly recommend doing this after you have gone through the canvas and prioritised your project goals

Canvas

“Theory of Change”, download here : Impact Canvas.pdf

Pictures from Issy Workshop: Pictures from workshop in Issy

Template

Theory of change						
Challenge	• Attractive and livable city center • City center should be accessible and safe for all users including VRs • Not just move car flows from one area to another and create heavy traffic in other parts of the city center. • Maintain safe traffic environments. • High accessibility for pedestrians, cyclists and public transport. • Lack of data for mobility planning, especially for VR.					
Solution 1	Short term impact		Medium term impact		Long term impact	
Temporary redesign of	More space for pedestrians and cyclist.	Promotes and enable active	Increase the support (public opinion and	Increase the share of pedestrians	Permanent redesigning of streets and	Contributes to the goal of

public space/streets to car free areas	Calmer traffic environment	means of transport Reduction of traffic noise and vibrations (Beneficial for health)	political support) for redesigning public space in city center in a way that decrease accessibility for cars		public space in city center	climate neutrality 2023 Improved health among residents and users
Solution 2	Short term impact		Medium term impact		Long term impact	
Bilmjuk stadskärna (“Car soft city center” Car traffic need to adopt to create a safe and accessible for all other sustainable transport modes)	xxx		The experience and knowledge from solution 1 and 2, leads to new understandings and evaluation models – important pieces to achieve a long standing change		A redesigned city center with “car soft” environment.	Equal accessibility to the city (VRU)
Vision	Further develop a living, vibrant and inclusive city center. Goal of becoming climate neutral by 2030. Transport is the biggest cause of emissions. Goals in SUMP state that by 2030 75% of all travel within the municipality should be made by sustainable transport modes, 50% for trips to/from the municipality. Cycling should increase by 1% per inhabitant yearly, while motor vehicle use per inhabitant should decrease by 1% on a yearly basis. Physical accessibility is to be improved for everyone, and is especially important for the disabled, children and the elderly. The number of people who feel that the traffic environment is safe is to increase on an annual basis.					

3. Evaluation indicators

WHAT YOU NEED TO DO NOW

Pick the indicators for your project. For the impact KPIs, looks which ones are relevant for your city and see which element of your intervention is best suited in measuring this data. If there is a mandatory KPI but you don’t have an impact that matched that outcome, you might need to consider adding elements to your solution that will create that impact. And it is always good to talk to the project management about this:
Jason (ICCS), Hans (Technical manager), Monica & James (WP7 leaders)

1. Identify indicators and write them next to the impact on your canvas

2. If you have KPIs that are mandatory for your city but no impact to address them, you will need to return to the previous step and add elements to your intervention that will enable you to achieve those outcomes of the KPIs
3. If you are very unsure on how to address this KPIs, please reach out to the project management team with contacts listed above
4. For the SUMIs, make sure to pick at least one per evaluation area
5. Outside of that, pick as many indicators as you think is useful. Keep in mind that you will need to evaluate the impact of your intervention in WP7, so the more indicators and data you collect, the more secure is a successful evaluation in the end
6. Every indicator has a fully detailed description provided in the Annex
7. Feel free to think of other indicators not part of the provided list. Please use the "light blue" template when describing them
8. Once you have decided on the indicators, will the template "Evaluation indicator". Copy past as many templates as you need and fill one template for each indicator, including the KPIs. Make sure to keep the headers colour coded:
   - dark blue = impact KPIs
   - light purple = SUMI
   - light blue = Other indicators
9. Take a second picture of the canvas (including the indicators) and upload it into the indicated area on your City Plan

Templates:

Templates:

Elaborator Impact KPIs (workplan)	
Name	**1.1 Expand intervention beyond LL**
Result of the evaluation	
Unit	
Method selected	
Scale of measurement	
Periods for data collection	2026
Additional comments	
Elaborator Impact KPIs (workplan)	
Name	**1.2** Addressing re-assessment of roads and public space quality scored over 75% in acceptance responding to needs of diverse groups.
Result of the evaluation	
Unit	%

Method selected	Interview, Survey
Scale of measurement	Intervention area and surrounding streets
Periods for data collection	2025-2026
Additional comments	

Elaborator Impact KPIs (workplan)	
Name	**1.3 Addressing a) rebalance of public space to b) achieve desired modal split** The project is aiming for a shift of modal split. This includes cycling, e-scooters, walking, public transport, or shared mobility. The intervention will redesign public space in order to achieve that. To give some examples, this can be a new distribution of space on the roads to allow safer space for cycling, more pedestrian crossings, less parking space to increase pedestrian pathways, more green areas and other infrastructure that will allow people with physical and cognitive mobility challenges to use the public space. Key here is, that it is very clear how your intervention has led to changes in the public space, that either motivate, enable, support or ensure people to use different modes of transport which is aimed by the city.
Result of the evaluation	
Unit	% change in modal split
Method selected	Counting sensors and speed/traffic management
Scale of measurement	Intervention area and surrounding streets
Periods for data collection	2024-2026
Additional comments	

Elaborator Impact KPIs (workplan)	
Name	2.1 Reduction of private car use
Result of the evaluation	
Unit	% change of number of cars
Method selected	Survey, Counting sensors and speed/traffic management, parking counts
Scale of measurement	Intervention area and surrounding streets
Periods for data collection	2024-2026
Additional comments	

Elaborator Impact KPIs (workplan)	
Name	2.4 5% increase of desired modal split
Result of the evaluation	
Unit	% change of modal split
Method selected	Counting sensors and speed/traffic management, Public transport operational data
Scale of measurement	Medival city
Periods for data collection	2024 - 2026
Additional comments	
Elaborator Impact KPIs (workplan)	
Name	**3.3 Decrease of safety risks** Cities need to show how their interventions are expected to actively contribute to reducing safety risks. This is more a general indicator, it could be looking at safety for pedestrians, cyclists or VRUs, it's up to the city to define their safety impact.
Result of the evaluation	
Unit	
Method selected	Survey
Scale of measurement	"Sommargågata"; Temporary redesigned public space/street
Periods for data collection	2024 - 2026
Additional comments	
Elaborator Impact KPIs (workplan)	
Name	**4.1 Increase of Zero Emission modes** Use of transport should increase amongst the modes of transport that reduce the air pollution in the LL. This can be for example cycling, walking, e-scooter, public transport etc. Here it will be not necessary to measure the reduction in air pollution, but the increase of use for services that contribute
Result of the evaluation	
Unit	%
Method selected	Counting sensors and speed/traffic management, public transport operational data
Scale of measurement	Medival city
Periods for data collection	2024 - 2026
Additional comments	Min 5% increase
Elaborator Impact KPIs (workplan)	

Name	**4.2 Reduction of emissions** Carbon dioxide emission reductions from the use of energy could be achieved by fuel conversion, increased efficiency, reducing energy demand and increased use of non-fossil energy sources. There needs to be an estimated 10% reduction of emission in LLs. It will need to be estimated as it will likely not be possible for cities to achieve that aim using this test bed of the LL. What needs to be evident is a development through the intervention that, at scale, will lead to the targeted reduction of emissions. This can be defined by observing the shift of modes of transport that will reduce air pollution at scale, by people's satisfaction with the changes of the intervention.
Result of the evaluation	
Unit	%
Method selected	Counting sensors and speed/traffic management, calculations based on traffic counts
Scale of measurement	Living lab area
Periods for data collection	2024-2026
Additional comments	
Elaborator Impact KPIs (workplan)	
Name	**4.5 Reduction in exposure to air and noise pollution** The scaling of the solutions is expected to reduce the road user's exposure to air and noise pollution by 10% min. What is important to show a clear link between the intervention and the aimed outcomes. It will be unlikely possible for cities to show data of the achieved aim, but measured data of the test results should point into that direction.
Result of the evaluation	
Unit	%
Method selected	CO2 and air pollution sensors, noise pollution sensors
Scale of measurement	Living lab area
Periods for data collection	2024 - 2026
Additional comments	
Elaborator Impact KPIs (workplan)	
Name	**4.6 Increase of quality-adjusted life years**

	This impact is expected to be generated by an uptake of active transport modes. That shift will increase the air quality and therefore improve the overall health of citizens. This is a long term impact and will be difficult to measure in such a short time frame and limited scale of the LLs. What will be important is to look at the intention's cities aim for to increase the use of active modes of transport which will then reduce air pollution.
Result of the evaluation	
Unit	years
Method selected	?
Scale of measurement	Medieval city?
Periods for data collection	?
Additional comments	
Elaborator Impact KPIs (workplan)	
Name	5.1 Toolkits adopted and deployed
Result of the evaluation	
Unit	Nbr of toolkits adopted and deployed
Method selected	-
Scale of measurement	Living Lab area
Periods for data collection	2024 - 2026
Additional comments	
Elaborator Impact KPIs (workplan)	
Name	5.2 Focus group consultation
Result of the evaluation	
Unit	Number of focus groups
Method selected	2. interviews and/or 3. WS
Scale of measurement	Citizens of City of Lund
Periods for data collection	2025 during redesign of area/street and after
Additional comments	

SUM indicator	
Name	**1.7 Quality of public spaces** Quality of public area, presence in the city of streets and squares that offer sociability and a good image.
Result of the evaluation	

Unit	Scale of satisfaction, % usage of area VRUs
Method selected	4. questionaries, camera-based sensors
Scale of measurement	Living lab area
Periods for data collection	Questionaries 2025 Measurements 2024 - 2026
Additional comments	
SUM indicator	
Name	**2.8 Modal split**
Result of the evaluation	
Unit	%
Method selected	11. traffic counts, 16. Public transport operational data
Scale of measurement	Living lab area
Periods for data collection	2024 - 2026
Additional comments	

Another indicator	
Name	**5.7 Intervention acceptance level** Acceptance of the intervention will mean the willingness of citizens to use the new products, services or spaces. The level suggests that we are looking at the proportion of people accepting it out of 100 citizens.
Result of the evaluation	
Unit	%
Method selected	4. questioners
Scale of measurement	Citizens City of Lund
Periods for data collection	2025
Additional comments	

4. Selecting data collection methods

WHAT YOU NEED TO DO NOW
For each indicator, choose the appropriate methods to collect data. Often, it is good to have both qualitative and quantitative data for an indicator so that you can get a more accurate picture. Below we provide a list of suggested qualitative and quantitative data collection methodologies. Each of them has guidelines attached. These guidelines should help collect data the right way to be used for evaluation purposes. Feel free to also choose

others, these here are just suggestions. It might still be useful to look at the guidelines for our suggested methodologies, as they might be applicable for your own methodologies, too. 1. Select methodologies making sure every indicator has a method allocated. It is possible to use the same method, or the data collected for multiple indicators 2. Fill in the template "Data collection methodologies". Copy and paste as many as you need to fill one template for each methodology

Template:

Data collection methodology	
Name of the methodology	Traffic counts
Type of data collected	Nbr of cars, trucks, pedestrians and cyclists
Evaluation indicators addressed	
Resources and equipment needed	
Timeline for data collection	2024-2026

Data collection methodology	
Name of the methodology	Sensors
Type of data collected	Transportation modes, speed, behavior
Evaluation indicators addressed	
Resources and equipment needed	Radar, camera based, LiDAR
Timeline for data collection	2024 - 2026

Data collection methodology	
Name of the methodology	Parking counts
Type of data collected	Nbr of parked cars per time unit
Evaluation indicators addressed	

Resources and equipment needed	
Timeline for data collection	2024-2026

Data collection methodology	
Name of the methodology	Public Transport data
Type of data collected	
Evaluation indicators addressed	
Resources and equipment needed	
Timeline for data collection	

Data collection methodology	
Name of the methodology	Survey
Type of data collected	
Evaluation indicators addressed	
Resources and equipment needed	
Timeline for data collection	

Data collection methodology	
Name of the methodology	Interview
Type of data collected	
Evaluation indicators addressed	
Resources and equipment needed	
Timeline for data collection	

Data collection methodology

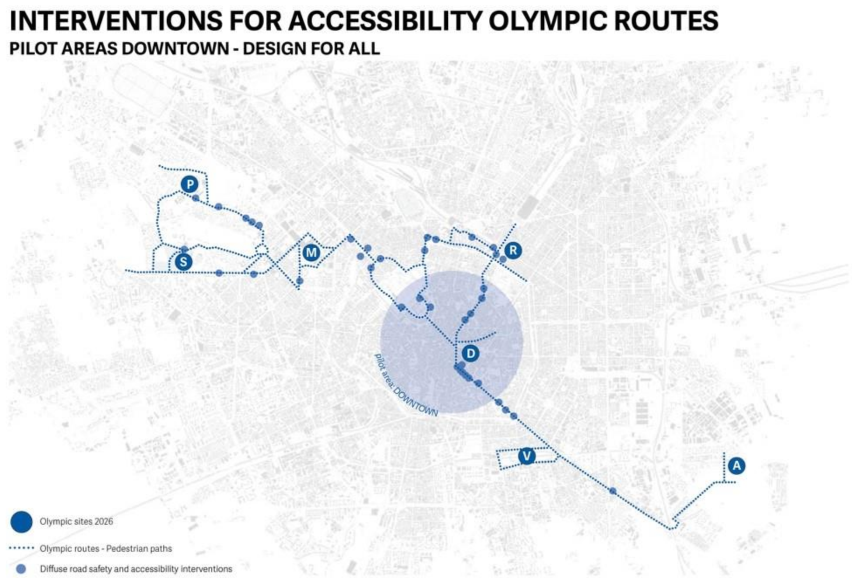
Name of the methodology	Questionnaire
Type of data collected	
Evaluation indicators addressed	
Resources and equipment needed	
Timeline for data collection	

Annex XIII: Evaluation Plan Milan

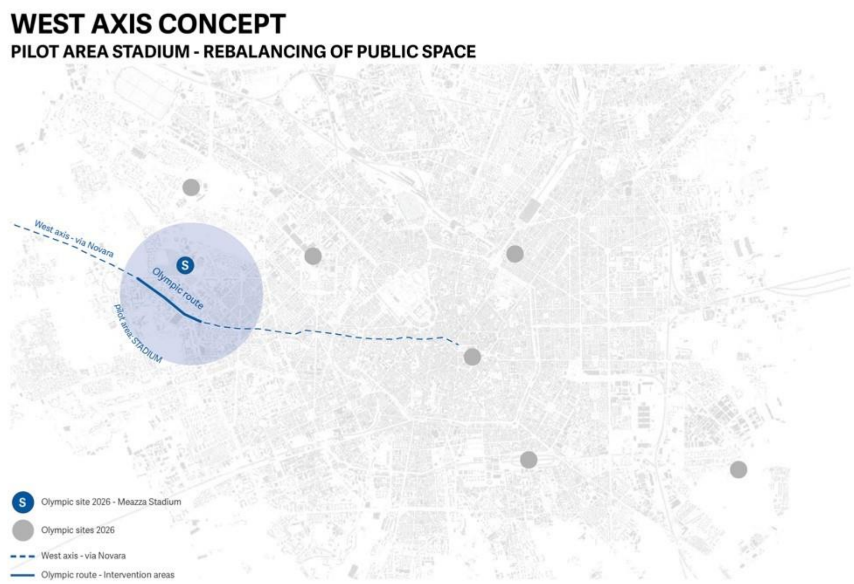
1. Description of the intervention

WHAT YOU NEED TO DO NOW
Use the template to fill in the description about your intervention. Descriptions for each item in the table are found in Part 2 of the Evaluation Plan Framework.

Intervention description	
Overall description	Downtown pilot: Improvement accessibility and safety Several crossings located along the Olympic routes planned for the Milan-Cortina 2026 Olympic and Paralympic Winter Games are non-accessible and characterized by low road safety, improper subdivision of public space in favor of private mobility and the absence of pedestrian continuity. With the ELABORATOR project, along with additional municipal and national funding, we are addressing over 30 intersections. For other inaccessible intersections along the same routes, works designed and funded by other interventions are currently underway.
Elements	Realization of raised crossings, road slides and widening of sidewalks, installation of tactile paving and sensors for people with visual impaired, insertion of speed restriction (30 km/h), creation of new urban green areas and new crossings. Mapping the public space of the city of Milan and construction of decision support system (DSS) to assess accessibility for people with disabilities by prioritizing interventions. Citizens and associations will be involved through moments of participation, questionnaires and workshops.
Main users	The interventions were designed for people with motor and visually disabilities, but they can be seen as an improvement for pregnant women, the elderly, parents and caregivers using buggies, and people with temporary injuries.
Boundaries	The interventions will be developed in the northwest area of Milan, in the center (it will be involved in the testing of sensors for people with visual impaired) and the southeast area. In the document, we refer to them as "Olympic routes interventions".

Area and location	

Intervention description	
Overall description	Stadium pilot: Co-creation of a regeneration project Via Novara is a western axis connecting Milan to Settimo Milanese and nowadays it has large streets characterized by absence of greenery and improper balance of public space and disregard for neighborhood size. The goal of the Stadium pilot is to co-create a concept with stakeholders for the regeneration of Via Novara. Part of the concept will be realized through tactical urbanism envisioning a possible realization of the whole regeneration concept designed for via Novara.
Elements	Planning a regeneration concept and designing a tactical urbanism intervention. Mapping the public space of the city of Milan and construction of decision support system (DSS) to improve accessibility for people with disabilities by prioritizing interventions. Citizens and associations will be involved through moments of participation, questionnaires, workshops and gamification.
Main users	Citizens, residents, VRUs, city users, NGOs and shopkeepers.
Boundaries	The pilot project is situated along a key access axis to Milan. The conceptual study for regeneration begins from the western municipal border (Settimo Milanese) and extends to the city center via a network of streets characterized by diverse geometric and functional attributes. The aim is to develop a unified project. Within this route, a delimited area will be identified for testing the concept through a tactical intervention. In the document, we refer to them as "West Axis".

Area and location	

2. Evaluation goal

WHAT YOU NEED TO DO NOW
You will need to fill a canvas of your Theory of Change. It is the same one we used for the workshop in Issy. Those are good starting points to complete and tidy up your Theory of Change. Pictures are uploaded on Sharepoint: Pictures from workshop in Issy 1. Download and print another canvas in your office OR use is digitally by downloading it on your computer and using PDF reader to fill the boxes Impact Canvas.pdf 2. Complete all sections, ensure that everything is well connected and there are no “free flowing” items on the canvas 3. Take a picture (Do not upload it for now) 4. Fill the information into the template “Theory of Change”. We highly recommend doing this after you have gone through the canvas and prioritised your project goals

Canvas

“Theory of Change”, download here : Impact Canvas.pdf

Pictures from Issy Workshop: Pictures from workshop in Issy

Template

Challenge	• Climate change including the specific issue of air quality • Road Deaths increase and safety issues • Obesity and population ageing • Covid-19 pandemic mind shift										
Solution 1	Short term impact										
Downtown pilot: Improvement accessibility and safety	Accessible and safe routes for everyone	Rebalancing public space	Activation of local communities	Improving LPT accessibility	Improving of urban green areas	Increase public awareness	Increase public awareness	Decrease in private car use	Decrease in deaths and injuries in road accidents	Increasing active mobility	Redevelopment of nodes and axes
Solution 2	Short term impact										
Stadium pilot: Co-creation of a regeneration process	Activation of local communities	Realization of tactical intervention		Increase public awareness		Increase public awareness		Decrease in deaths and injuries in road accidents		Increasing active mobility	Redevelopment of nodes and axes
Solution 3	Short term impact										
Vision	• Increase the air quality • Zero risk vision • Universal accessibility of the city of Milan • Greening and new urban infrastructures										

3. Evaluation indicators

WHAT YOU NEED TO DO NOW
Pick the indicators for your project. For the impact KPIs, looks which ones are relevant for your city and see which element of your intervention is best suited in measuring this data. If there is a mandatory KPI but you don't have an impact that matched that outcome, you might need to consider adding elements to your solution that will create that impact. And it is always good to talk to the project management about this: Jason (ICCS), Hans (Technical manager), Monica & James (WP7 leaders) 1. Identify indicators and write them next to the impact on your canvas 2. If you have KPIs that are mandatory for your city but no impact to address them, you will need to return to the previous step and add elements to your intervention that will enable you to achieve those outcomes of the KPIs 3. If you are very unsure on how to address this KPIs, please reach out to the project management team with contacts listed above 4. For the SUMIs, make sure to pick at least one per evaluation area 5. Outside of that, pick as many indicators as you think is useful. Keep in mind that you will need to evaluate the impact of your intervention in WP7, so the more indicators and data you collect, the more secure is a successful evaluation in the end 6. Every indicator has a fully detailed description provided in the Annex 7. Feel free to think of other indicators not part of the provided list. Please use the "light blue" template when describing them 8. Once you have decided on the indicators, will the template "Evaluation indicator". Copy past as many templates as you need and fill one template for each indicator, including the KPIs. Make sure to keep the headers colour coded: - dark blue = impact KPIs - light purple = SUMI - light blue = Other indicators 9. Take a second picture of the canvas (including the indicators) and upload it into the indicated area on your City Plan

Templates:

Elaborator Impact KPIs (workplan)	
Name	(1.1) Expand interventions beyond the LL
Result of the evaluation	
Unit	number
Method selected	Review test result and measure impact
Scale of measurement	City-wide
Periods for data collection	Once, at the end
Additional comments	Mapping of public space and sharing of data on OpenStreetMap. For the project, mapping of the

	intervention area would be sufficient, with the intention of expanding mapping to the entire city.

Elaborator Impact KPIs (workplan)	
Name	(1.2) Addressing re-assessment of roads and public space quality scored over 75% in acceptance responding to needs of diverse groups
Result of the evaluation	
Unit	%
Method selected	3 workshop, 4 Questionnaire
Scale of measurement	Olympic routes intervention (Downtown pilot)
Periods for data collection	Before (2024) and after implementation (2026)
Additional comments	A workshop with on-site visits for the most important interventions, and a questionnaire for other interventions.

SUM indicator	
Name	(1.7) Quality of public spaces
Result of the evaluation	
Unit	% of satisfaction
Method selected	4 Questionnaire
Scale of measurement	Olympic routes intervention (Downtown pilot)
Periods for data collection	Before (2024) and after implementation (2026)
Additional comments	Connected to 1.2

Elaborator Impact KPIs (workplan)	
Name	(2.1) Reduction of private car use
Result of the evaluation	
Unit	%
Method selected	11 Traffic counts
Scale of measurement	West Axis tactical intervention (Stadium pilot)
Periods for data collection	Before (2025) and during experimentation (2026)
Additional comments	

Elaborator Impact KPIs (workplan)

Name	(2.4) 5% increase of desired modal split
Result of the evaluation	
Unit	%
Method selected	11 Traffic counts
Scale of measurement	West Axis tactical intervention (Stadium pilot)
Periods for data collection	Before (2025) and during experimentation (2026)
Additional comments	

SUM indicator	
Name	(2.5) Access to mobility services
Result of the evaluation	
Unit	%
Method selected	4 questionnaire, 14 Public and Private services databases (OpenStreetMap)
Scale of measurement	Olympic routes intervention (Downtown pilot)
Periods for data collection	Before (2024) and after implementation (2026)
Additional comments	The mapping of accessibility features of public space and the software for their assessment are developed within the project (Decision Support System). The assessment of architectural barriers (by type) will be done through questionnaires.

Elaborator Impact KPIs (workplan)	
Name	(3.3) Decrease of safety risks
Result of the evaluation	
Unit	%
Method selected	4 questionnaire
Scale of measurement	Olympic routes intervention (Downtown pilot)
Periods for data collection	Before (2024) and after implementation (2026)
Additional comments	

Elaborator Impact KPIs (workplan)	
Name	(3.5) 3-Star rating for pedestrians and micro mobility users

Result of the evaluation	
Unit	%
Method selected	Star rating system
Scale of measurement	Olympic routes intervention (Downtown pilot)
Periods for data collection	After implementation (2026)
Additional comments	

SUM indicator	
Name	(3.8) Accessibility of public transport for mobility impaired groups
Result of the evaluation	
Unit	
Method selected	3 workshop, 4 Questionnaire
Scale of measurement	Olympic routes intervention (Downtown pilot)
Periods for data collection	After implementation (2026)
Additional comments	

Another indicator	
Name	(3.10) Speed
Result of the evaluation	
Unit	
Method selected	6 Road data from device
Scale of measurement	Olympic routes intervention (Downtown pilot)
Periods for data collection	Before (2024) and after implementation (2026)
Additional comments	Data processing based on proprietary licensed data (TomTom).

Another indicator	
Name	(3.11) Perceived safety
Result of the evaluation	
Unit	rating

Method selected	3 workshop
Scale of measurement	West Axis tactical intervention (Stadium pilot)
Periods for data collection	Before (2025) and during experimentation (2026)
Additional comments	

Elaborator Impact KPIs (workplan)	
Name	(4.1) Increase of Zero Emission modes
Result of the evaluation	
Unit	%
Method selected	11 Traffic counts
Scale of measurement	West Axis tactical intervention (Stadium pilot)
Periods for data collection	Before (2025) and during experimentation (2026)
Additional comments	

Elaborator Impact KPIs (workplan)	
Name	(4.2) Reduction of emissions
Result of the evaluation	
Unit	% of share with a qualitative score (1-5) of the perception of quality
Method selected	4 Questionnaire
Scale of measurement	Olympic routes intervention (Downtown pilot)
Periods for data collection	Before (2024) and after implementation (2026)
Additional comments	

Elaborator Impact KPIs (workplan)	
Name	(4.5) Increase of quality-adjusted life years
Result of the evaluation	
Unit	%
Method selected	4 Questionnaire, 11 Traffic counts
Scale of measurement	West Axis tactical intervention (Stadium pilot)
Periods for data collection	Before (2025) and during experimentation (2026)

Additional comments	

Elaborator Impact KPIs (workplan)	
Name	(4.6) Reduction in exposure to air and noise pollution
Result of the evaluation	
Unit	%
Method selected	4 Questionnaire, 11 Traffic counts
Scale of measurement	West Axis tactical intervention (Stadium pilot)
Periods for data collection	Before (2025) and during experimentation (2026)
Additional comments	

Elaborator Impact KPIs (workplan)	
Name	(4.8) Adapting to climate change
Result of the evaluation	
Unit	number
Method selected	
Scale of measurement	Olympic routes intervention (Downtown pilot)
Periods for data collection	After implementation (2026)
Additional comments	

Elaborator Impact KPIs (workplan)	
Name	(5.1) Toolkits adopted and deployed
Result of the evaluation	
Unit	Number of toolkits adopted and deloyed
Method selected	
Scale of measurement	West Axis tactical intervention (Stadium pilot)
Periods for data collection	before experimentation (2025)
Additional comments	Gamification tool

Elaborator Impact KPIs (workplan)	
Name	(5.2) Focus group consultation
Result of the evaluation	
Unit	Number of focus groups
Method selected	
Scale of measurement	Downtown pilot and Stadium Pilot
Periods for data collection	During the project
Additional comments	

Elaborator Impact KPIs (workplan)	
Name	(5.7) Intervention acceptance level
Result of the evaluation	
Unit	% of acceptance
Method selected	3 workshop, 4 Questionnaire
Scale of measurement	West Axis tactical intervention (Stadium pilot)
Periods for data collection	During experimentation (2026)
Additional comments	

4. Data collection methods

WHAT YOU NEED TO DO NOW
For each indicator, choose the appropriate methods to collect data. Often, it is good to have both qualitative and quantitative data for an indicator so that you can get a more accurate picture. Below we provide a list of suggested qualitative and quantitative data collection methodologies. Each of them has guidelines attached. These guidelines should help collect data the right way to be used for evaluation purposes. Feel free to also choose others, these here are just suggestions. It might still be useful to look at the guidelines for our suggested methodologies, as they might be applicable for your own methodologies, too. 1. Select methodologies making sure every indicator has a method allocated. It is possible to use the same method, or the data collected for multiple indicators

2. Fill in the template "Data collection methodologies". Copy and paste as many as you need to fill one template for each methodology

Template:

Data collection methodology	
Name of the methodology	Workshop
Type of data collected	Qualitative and quantitative
Evaluation indicators addressed	KPIs: 1.2, 5.7 SUMIs: 3.8 Other: 3.11
Resources and equipment needed	
Timeline for data collection	2024, 2025, 2026

Data collection methodology	
Name of the methodology	Questionnaire
Type of data collected	Qualitative and quantitative
Evaluation indicators addressed	KPIs: 1.2, 3.3, 4.2, 4.5, 4.6, 5.7 SUMIs: 1.7, 2.5, 3.8 Other: -
Resources and equipment needed	
Timeline for data collection	2024, 2025, 2026

Data collection methodology

Name of the methodology	Traffic counts
Type of data collected	Quantitative
Evaluation indicators addressed	KPIs: 2.1, 2.4, 4.1, 4.5, 4.6 SUMIs: - Other: -
Resources and equipment needed	Scout cameras for vehicle counting.
Timeline for data collection	2025, 2026

Data collection methodology	
Name of the methodology	Public and Private service database (Openstreetmap)
Type of data collected	Quantitative
Evaluation indicators addressed	KPIs: 2.5 SUMIs: - Other: -
Resources and equipment needed	Development of a tailored decision support system for utilizing OpenStreetMap data.
Timeline for data collection	2024, 2026

Data collection methodology	
Name of the methodology	Star rating system
Type of data collected	Quantitative
Evaluation indicators addressed	KPIs: 3.5 SUMIs: - Other: -
Resources and equipment needed	

Timeline for data collection	2026

Data collection methodology	
Name of the methodology	Road data from device
Type of data collected	Quantitative
Evaluation indicators addressed	KPIs: - SUMIs: - Other: 3.10
Resources and equipment needed	Subscription to a traffic data platform (TomTom).
Timeline for data collection	2024, 2026

Annex XIV: Evaluation Plan Split

1. Description of the intervention

WHAT YOU NEED TO DO NOW
Use the template to fill in the description about your intervention. Descriptions for each item in the table are found in Part 2 of the Evaluation Plan Framework.

Template:

Intervention description	
Overall description	Video surveillance systems
Elements	Implementation of the video surveillance systems to enable enforcement of penalties for misuse of the shared infrastructure. Identify real mobility needs and public space re-design needs and possibilities. Testing new technology and data collection
Main users	Administrative Department for Communal Affairs, Department for Transport Citizens Drivers Users of public transport
Boundaries	Implementing video surveillance systems raises privacy concerns among citizens. Compliance with relevant laws, regulations, and standards governing the use of video surveillance technology, including data protection laws and privacy regulations. Acknowledge and address technical limitations of the video surveillance systems, such as blind spots, image quality, and environmental factors, to ensure effective monitoring and enforcement. Rebellion among drivers - Drivers parking improperly due to lack of parking space, influenced by their current habits and previous lack of penalties.
Area and location	

The map shows the locations that will be covered by the project (red dots); however, it is important to note that the city of Split is currently in the process of a public call for expressions of interest from economic entities for the demonstration of software solutions for automatic recognition of improper parking and stopping using the existing video surveillance system. Three companies have responded to the public call and will deploy their systems during a demonstration period of 40 days. Based on this tight timeframe, the city will gain insights into the operation of all systems and create technical specifications for the products, as well as the necessary functionalities for the publication of the Call for Bids and the procurement of systems within the Elaborator project.

2. Evaluation goal

WHAT YOU NEED TO DO NOW

You will need to fill a canvas of your Theory of Change. It is the same one we used for the workshop in Issy. Those are good starting points to complete and tidy up your Theory of Change. Pictures are uploaded on Sharepoint: Pictures from workshop in Issy

1. Download and print another canvas in your office OR use is digitally by downloading it on your computer and using PDF reader to fill the boxes Impact Canvas.pdf
2. Complete all sections, ensure that everything is well connected and there are no “free flowing” items on the canvas
3. Take a picture (Do not upload it for now)
4. Fill the information into the template “Theory of Change”. We highly recommend doing this after you have gone through the canvas and prioritised your project goals

Canvas

"Theory of Change", download here : Impact Canvas.pdf

Pictures from Issy Workshop: Pictures from workshop in Issy

Template

Theory of change						
Challenge	Privacy Concerns: Ensure compliance with privacy laws, obtain consent, and implement measures to protect citizens' privacy. Data Security: Safeguard sensitive data generated by the surveillance system through encryption, access controls, and regular security audits. Cost and Infrastructure: Address the expenses of setup, maintenance, and personnel for monitoring and managing the system. Technological Challenges: Integrate the surveillance system with existing infrastructure and technologies, considering compatibility and interoperability. Rebellion among drivers: Drivers parking improperly due to lack of parking space, influenced by their current habits and previous lack of penalties.					
Solution 1	**Short term impact**		**Medium term impact**		**Long term impact**	
Implementation of the video surveillance system to enable enforcement of penalties for misuse of the shared infrastructure	NEGATIVE: driver revolt due to collected fines for illegally parked vehicle	POSITIVE: Less illegal parking in surveillance zone	NEGATIVE: driver will find new parking zones outside surveillance zones	POSITIVE: Better traffic flow prioritize citizens safety, privacy, and convenience while using public spaces and transportation services	NEGATIVE:	POSITIVE: Changing drivers' behavior Usage of personal cars is minimized Road safety is enhancement
Vision	Increase and promotion od alternative transport modes leading to the eventual redesign of urban public spaces that are now heavily occupied by cars.					

3. Evaluation indicators

WHAT YOU NEED TO DO NOW
Pick the indicators for your project. For the impact KPIs, looks which ones are relevant for your city and see which element of your intervention is best suited in measuring this data. If there is a mandatory KPI but you don't have an impact that matched that outcome, you might need to consider adding elements to your solution that will create that impact. And it is always good to talk to the project management about this: Jason (ICCS), Hans (Technical manager), Monica & James (WP7 leaders) 1. Identify indicators and write them next to the impact on your canvas 2. If you have KPIs that are mandatory for your city but no impact to address them, you will need to return to the previous step and add elements to your intervention that will enable you to achieve those outcomes of the KPIs 3. If you are very unsure on how to address this KPIs, please reach out to the project management team with contacts listed above 4. For the SUMIs, make sure to pick at least one per evaluation area 5. Outside of that, pick as many indicators as you think is useful. Keep in mind that you will need to evaluate the impact of your intervention in WP7, so the more indicators and data you collect, the more secure is a successful evaluation in the end 6. Every indicator has a fully detailed description provided in the Annex 7. Feel free to think of other indicators not part of the provided list. Please use the "light blue" template when describing them 8. Once you have decided on the indicators, will the template "Evaluation indicator". Copy past as many templates as you need and fill one template for each indicator, including the KPIs. Make sure to keep the headers colour coded: - dark blue = impact KPIs - light purple = SUMI - light blue = Other indicators 9. Take a second picture of the canvas (including the indicators) and upload it into the indicated area on your City Plan

Templates:

Elaborator Impact KPIs (workplan)	
Name	***1.1 Expand intervention beyond the LL***
Result of the evaluation	
Unit	*%* *Number of detected violations*
Method selected	*Survey* *Data collection from software*

Scale of measurement	*Intervention in pilot locations*
Periods for data collection	*2024, 2025*
Additional comments	

SUM indicator	
Name	***1.7 Quality of public spaces***
Result of the evaluation	
Unit	*% of satisfaction* *Number of detected violations*
Method selected	*Survey* *Data collection from software*
Scale of measurement	*Intervention in pilot locations*
Periods for data collection	*2024, 2025*
Additional comments	

Elaborator Impact KPIs (workplan)	
Name	***2.1 Reduction of private car usage***
Result of the evaluation	
Unit	*%*
Method selected	*Counting sensors and speed/traffic management* *Number of detected violations*
Scale of measurement	*Intervention in pilot locations*
Periods for data collection	*2025, 2026*
Additional comments	

SUM indicator	
Name	***2.5 Access to mobility services***
Result of the evaluation	
Unit	*%*

Method selected	*Survey*
Scale of measurement	*Intervention in pilot locations*
Periods for data collection	*2025*
Additional comments	

Elaborator Impact KPIs (workplan)	
Name	***3.3. Decrease of safety risks***
Result of the evaluation	
Unit	*% of satisfaction* *Number of detected violations,* *number of traffic accidents in the video surveillance areas*
Method selected	*Survey* *Data collection from software* *Traffic accident data comparison (Ministry of the Interior)*
Scale of measurement	*Intervention in pilot locations*
Periods for data collection	*2024, 2025*
Additional comments	

SUM indicator	
Name	***3.6. Road deaths***
Result of the evaluation	
Unit	*%*
Method selected	*Survey* *Data collection from Ministry of the Interior*
Scale of measurement	*Intervention in pilot locations* *Traffic accident data comparison (Ministry of the Interior)*
Periods for data collection	*2024, 2025*
Additional comments	

Another indicator	
Name	***3.11. Perceived safety***
Result of the evaluation	
Unit	*%*
Method selected	*Survey*
Scale of measurement	*Intervention in pilot locations*
Periods for data collection	*2025*
Additional comments	

Elaborator Impact KPIs (workplan)	
Name	***4.2 Reduction of emissions***
Result of the evaluation	
Unit	*% of share with a qualitative score (1-5) of the perception of quality*
Method selected	*Survey* *PTV simulation*
Scale of measurement	*Intervention in pilot locations*
Periods for data collection	*2024,2025*
Additional comments	

SUM indicator	
Name	***4.10 Air pollutant emissions***
Result of the evaluation	
Unit	*% of share with a qualitative score (1-5) of the perception of quality*
Method selected	*Survey*
Scale of measurement	*Intervention in pilot locations*
Periods for data collection	*2024,2025*
Additional comments	

Elaborator Impact KPIs (workplan)	
Name	***5.1 Toolkits adopted and deployed***
Result of the evaluation	
Unit	*number of implemented tools*
Method selected	*Public pronouncement*
Scale of measurement	*Intervention in pilot locations*
Periods for data collection	*2024, 2025*
Additional comments	

SUM indicator	
Name	***5.5 Security***
Result of the evaluation	
Unit	*%*
Method selected	*Survey*
Scale of measurement	*Intervention in pilot locations*
Periods for data collection	*2025*
Additional comments	

Another indicator	
Name	***5.7 Intervention acceptance level***
Result of the evaluation	
Unit	*% of acceptance*
Method selected	*Survey*
Scale of measurement	*Intervention in pilot locations*
Periods for data collection	*2025*

Additional comments	

4. Data collection methods

WHAT YOU NEED TO DO NOW
For each indicator, choose the appropriate methods to collect data. Often, it is good to have both qualitative and quantitative data for an indicator so that you can get a more accurate picture. Below we provide a list of suggested qualitative and quantitative data collection methodologies. Each of them has guidelines attached. These guidelines should help collect data the right way to be used for evaluation purposes. Feel free to also choose others, these here are just suggestions. It might still be useful to look at the guidelines for our suggested methodologies, as they might be applicable for your own methodologies, too. 1. Select methodologies making sure every indicator has a method allocated. It is possible to use the same method, or the data collected for multiple indicators 2. Fill in the template “Data collection methodologies”. Copy and paste as many as you need to fill one template for each methodology

Template:

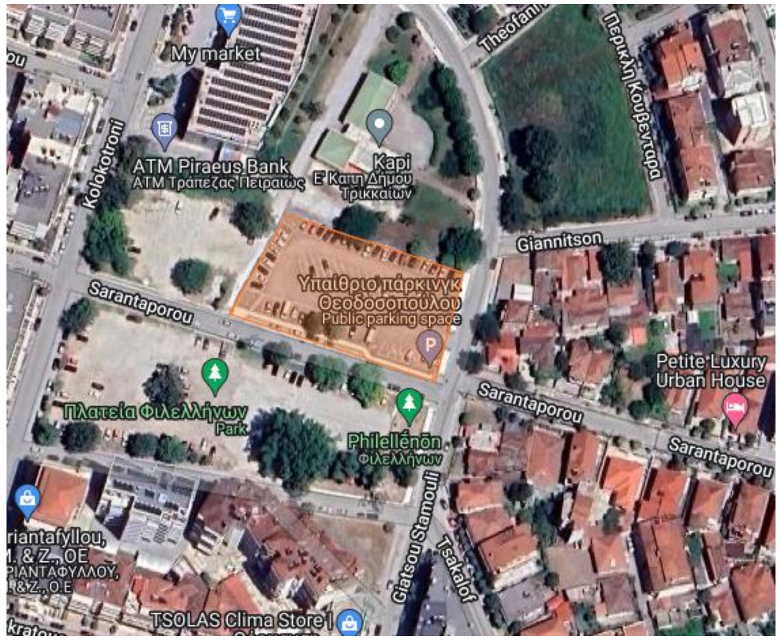
Data collection methodology	
Name of the methodology	
Type of data collected	
Evaluation indicators addressed	
Resources and equipment needed	
Timeline for data collection	

Annex XV: Evaluation Plan Trikala

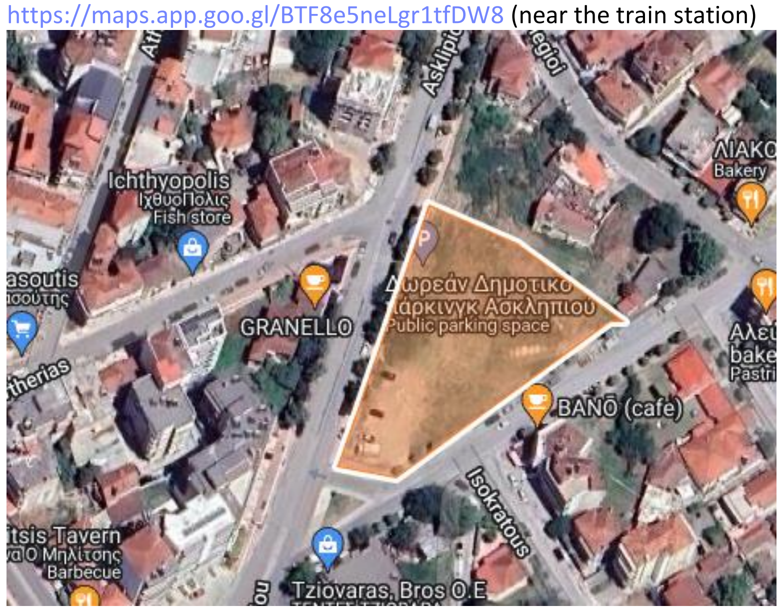
1. Description of the intervention

WHAT YOU NEED TO DO NOW
Use the template to fill in the description about your intervention. Descriptions for each item in the table are found in Part 2 of the Evaluation Plan Framework.

1.Intervention description	
Overall description	**Designing new Park&ride services** Installation of new park and ride stations at the periphery of the city. In this way the citizens will be able to leave their car at the parking lot and commute to the city centre via the bikes offered
Elements	Installation of 3 park and ride stations at the periphery of the city. In 30 new bikes in total for all park and ride stations (note: more bicycles are also available at the info point, located at the city centre) Installation of software for monitoring bicycle stations
Main users	Rural citizens, city visitors, people living in suburban areas
Boundaries	All three park and ride stations are open 24hours a day. Potential users are all people who are driving or taking a train from areas outside the city and want to commute at the city centre.
Area and location	3 Municipal parking at the main entrances of the city and near major points of interest: - https://maps.app.goo.gl/AACQKffn6SFtuk5CA (near the military school)



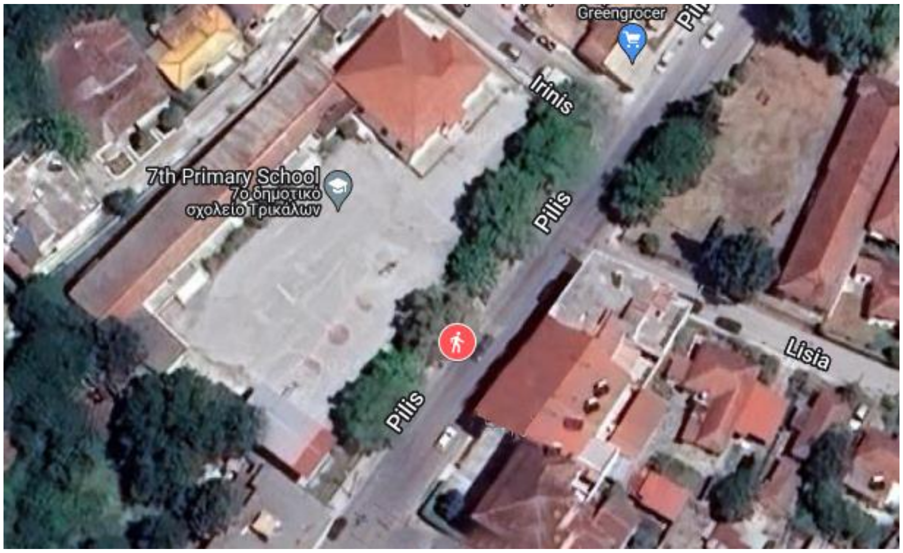
- https://maps.app.goo.gl/BTF8e5neLgr1tfDW8 (near the train station)



- https://maps.app.goo.gl/7k9vxVSxUkCw32kB7 (near the hospital)

2.Intervention description	
Overall description	Implementation a sensor system to monitor illegal parking on bike lanes and provide real time information to the municipal police. The data collected from the sensors will provide information to re-design safer bike lanes. The data gathered will allow the Municipal police to identify thus better monitor high risk areas
Elements	60 Sensors to record the use of bikes and software for monitoring the bikes' fleet (including biometrics) 10 sensors in 5 areas that the bike lanes are often violated by illegal parking
Main users	Cyclists, municipal police, Municipal Department in Urban Planning and Transport
Boundaries	City Center
Area and location	The sensors will be located on the bike lane of the following areas: 1 sensor on Kapodistriou str: https://maps.app.goo.gl/hbtj2bpimDbwGsMv9 2 sensors on Sarafi str: https://maps.app.goo.gl/BH6dsF5KATwhGQR8A 3 sensors across Dionisiou str: https://maps.app.goo.gl/7Fr7z2tmWfHJqNoU7

	3 sensors across Kapodistriou and Peleki str: https://maps.app.goo.gl/bNaKDax7Tnrmyedy9 1 sensor on Amalias str: https://maps.app.goo.gl/CDnvRASGxPtSD8kH9
3.Intervention description	
Overall description	Installation of 1 smart crossings outside schools for traffic control
Elements	The smart crossing is activating an alert lighting system that is visible to drivers when pedestrians and children are approaching the crossing.
Main users	Pedestrians and children
Boundaries	The smart crossings will be implemented on the nearest to the school existing crossing
Area and location	 There will be one area of intervention where the road is of high risk (high speed and increased traffic) and at the same time a school is located: Pilis str, in front of the primary school: https://maps.app.goo.gl/YPx6PQzQeEWPtw948

4.Intervention description	
Overall description	Integration of the existing SMARTA2 app to allow residents to access the city as well as to evaluate the experience/sense of comfort of the citizens and vulnerable to exclusion groups

Elements	The SMARTA 2 app has already being tested and will soon be integrated to SMARTA 3. The service consists of: Real time information of the bus routes Booking service for lockers, bicycles and wheelchair scooter Carpooling service
Main users	Rural, suburban citizens, tourists, daily visitors, cyclists, people with mobility issues, students
Boundaries	N/A
Area and location	N/A

5.Intervention description	
Overall description	Participatory workshops to - Identify potential obstacles that prohibit women from choosing more active personal mobility options - Evaluate the sense of safety for women cyclists - Examine new mobility ways to support caregivers and elderly
Elements	Will be conducted with the support of URBANA
Main users	Vulnerable groups e.g women , cyclists, caregivers, elderly
Boundaries	N/A
Area and location	N/A

2. Evaluation goal

WHAT YOU NEED TO DO NOW
You will need to fill a canvas of your Theory of Change. It is the same one we used for the workshop in Issy. Those are good starting points to complete and tidy up your Theory of Change. Pictures are uploaded on Sharepoint: Pictures from workshop in Issy

1. Download and print another canvas in your office OR use is digitally by downloading it on your computer and using PDF reader to fill the boxes Impact Canvas.pdf 2. Complete all sections, ensure that everything is well connected and there are no "free flowing" items on the canvas 3. Take a picture (Do not upload it for now) 4. Fill the information into the template "Theory of Change". We highly recommend doing this after you have gone through the canvas and prioritised your project goals

Canvas

"Theory of Change", download here : Impact Canvas.pdf

Pictures from Issy Workshop: Pictures from workshop in Issy

Template

Theory of change			
Challenge	Approximately 35% of the citizens live at the suburban or rural areas and need to commute to the city center on a daily base. At the same time the rural areas are underserved by public transport and mobility largely depends on individual car use. Having so many private cars at the city center has a negative impact - Causes traffic accidents - Decrease the quality of life of the pedestrians and cyclists - Causes traffic congestion - Increase gas emissions and noise pollution		
Solution 1: Designing new Park&ride services	Short term impact	Medium term impact	Long term impact
Installation of 3 park and ride stations at the periphery of the city. 30 new bikes in total for all park and ride stations Installation of software for monitoring bicycle stations Note: In relation to this intervention there are still very important parameters pending: 1.	Increase awareness on sustainable mobility and the availability to combine different means of transportation Offer alternative ways to commute at the city center	Increase the use of municipal bikes Reduce of private car use at the city center Increase rate of parking spaces occupation at the 3 park and ride stations Increase use of public spaces at the city center Increase accessibility to the city for rural citizens,	Creation of new businesses at the periphery near the park and ride stations Reduce of car emissions and traffic at the city center Increase the socioeconomic benefits for the stores at the city center

How to monitor the cars that park via sensors, 2. Where and how to lock the bikes by the users All pending issues will be solved the next 2 -3 months and therefore the service, KPIs and evaluation tools may also change		visitors and people commuting from the periphery to the city center	
Solution 2: Redesigning cycling lanes and fostering data collection	Short term impact	Medium term impact	Long term impact
60 Sensors to record the use of bikes and software for monitoring the bikes' fleet (including biometrics) Implementation of 10 sensors to record illegal parking illegal parking on bike lanes and provide real time information to the municipal police. The data collected from the sensors will provide information to re-design safer bike lanes Note: sensors measuring the outdoor air quality will be implemented near areas of interventions	Raise awareness to the drivers that there is a bike lane	Reduce violations on bike lanes by cars Increased Law Enforcement Efficiency: Real-time alerts to the municipal police can lead to quicker response times to illegal parking incidents, which can act as a deterrent to potential Enhanced Traffic Flow: Clear bike lanes can improve overall traffic flow, as cyclists won't obstruct other vehicles when avoiding obstacles, which can help reduce traffic congestion Improved Bike Lane Safety: By detecting and reporting illegal parking, bike lanes can be kept clear for cyclists, reducing the risk of accidents caused by cyclists having to swerve into traffic to avoid parked vehicle Collect data about the bike lanes that are violated more often	Increase use of bikes all around the city Better Data for Urban Planning: The data collected from these sensors can provide valuable insights into parking patterns and can be used to inform future urban planning decisions, such as where to expand bike lanes or increase parking facilities The data gathered will allow the Municipal police to identify high risk areas and better monitor them Positive Environmental Impact: Encouraging cycling by ensuring bike lanes are safe and accessible can lead to a reduction in car usage, which can have a positive effect on air quality and carbon emission Public Awareness and Behavior Change: The presence of monitoring systems can raise public awareness about the importance of keeping

			bike lanes clear, potentially leading to a change in driver behavior and more respect for cyclists' space Increase feeling of safety to the bikers
Solution 3: Designing new smart crossing tools	Short term impact	Medium term impact	Long term impact
Installation of 1 smart crossing outside school facilities for traffic control.	Raise awareness to the drivers that there is a school nearby integrate smart infrastructure and road safety measures around schools	Enhanced Safety for Children Adaptability to Traffic Flow: The crossing can widen in response to demand, accommodating large groups of children crossing at peak times, such as when school starts or end Reduction of speed limit from drivers in this area Reduction in Accidents: By constantly learning from the behaviors of road users, smart crossings can adapt their markings and signals in real-time to prevent accidents	Increase active mobility in children Encouraging Safe Behavior: Studies have shown that children accompanied by adults and holding hands exhibit safer crossing behaviors. Smart crossings can reinforce these behaviors by providing clear and interactive signals that encourage children to stop and look before crossing Increase sense of safety to pedestrians Deterrence of Distracted Crossing: With the rise of mobile phone use, smart crossings can help in mitigating the risks associated with distracted pedestrians, especially adolescents, by providing clear and attention-grabbing signals to the drivers
Solution 4: Expanding the SMARTA online application	Short term impact	Medium term impact	Long term impact
Integration of the existing SMARTA2 app to allow residents to access the	Integration of the existing SMARTA2 APP with additional modes	Increase the use of the app to a larger group of people	Increase sustainable mobility to the city

city as well as to evaluate the experience/sense of comfort of the citizens and vulnerable to exclusion groups	Re-introduce the app to the local community and raize awareness on the importance of sustainable mobility	Increase of users acceptance and satisfaction	Increase the number of people using the app to combine different means of transportation Decrease of car use at the city center
Solution 5: Participatory research and engagement of vulnerable groups in Trikala	Short term impact	Medium term impact	Long term impact
Participatory workshops to - Identify potential obstacles that prohibit women from choosing more active personal mobility options - Evaluate the sense of safety for women cyclists - Examine new mobility ways to support caregivers and elderly	Increased Awareness: These workshops can raise awareness among city planners and policymakers about the unique mobility needs and safety concerns of women, caregivers, and the elderly	Informed Urban Design: Insights from these workshops can inform the design of safer and more accessible transportation systems that cater to the needs of women and other vulnerable group	Empowerment Through Mobility: By addressing safety and accessibility, such workshops can empower women to participate more actively in the workforce and public life, leading to greater economic and social inclusion Enhanced Safety: Evaluating the sense of safety for women cyclists can lead to targeted interventions that make cycling and other forms of active mobility safer for women, thereby encouraging their use Support for Caregivers and Elderly: Examining new mobility options can lead to the development of services and infrastructure that support the mobility of caregivers and the elderly, enhancing their independence and quality of life Policy Development: The findings from

			participatory workshops can contribute to the development of gender-sensitive policies and programs that promote equitable access to transportation and public space
Vision	Provide to the citizens alternative and sustainable mobility solutions that allows them to use bikes instead of cars and combine different public transportation services more efficiently. Create a safe environment for vulnerable groups such as women, cyclists, elderly etc to commute at the city in an active and sustainable way e.g walk or take a bike Increase quality of life by providing an urban environment with less noise, traffic, gas emissions and road accidents		

3. Evaluation indicators

WHAT YOU NEED TO DO NOW

Pick the indicators for your project. For the impact KPIs, looks which ones are relevant for your city and see which element of your intervention is best suited in measuring this data. If there is a mandatory KPI but you don't have an impact that matched that outcome, you might need to consider adding elements to your solution that will create that impact. And it is always good to talk to the project management about this:
Jason (ICCS), Hans (Technical manager), Monica & James (WP7 leaders)

1. Identify indicators and write them next to the impact on your canvas
2. If you have KPIs that are mandatory for your city but no impact to address them, you will need to return to the previous step and add elements to your intervention that will enable you to achieve those outcomes of the KPIs
3. If you are very unsure on how to address this KPIs, please reach out to the project management team with contacts listed above
4. For the SUMIs, make sure to pick at least one per evaluation area
5. Outside of that, pick as many indicators as you think is useful. Keep in mind that you will need to evaluate the impact of your intervention in WP7, so the more indicators and data you collect, the more secure is a successful evaluation in the end
6. Every indicator has a fully detailed description provided in the Annex
7. Feel free to think of other indicators not part of the provided list. Please use the "light blue" template when describing them

8. Once you have decided on the indicators, will the template "Evaluation indicator". Copy past as many templates as you need and fill one template for each indicator, including the KPIs. Make sure to keep the headers colour coded:
   - dark blue = impact KPIs
   - light purple = SUMI
   - light blue = Other indicators
9. Take a second picture of the canvas (including the indicators) and upload it into the indicated area on your City Plan

Templates:

Elaborator Impact KPIs	
Name	2.1 Reduction of private car use
Result of the evaluation	
Unit	%
Method selected	Survey, Counting sensors and speed/traffic management
Scale of measurement	The entire city; both city center and peri-urban areas
Periods for data collection	Before:2024 After:2025
Additional comments	Related to Civitas SUMI "Modal Split"

Elaborator Impact KPIs	
Name	2.4 5% increase of desired modal split
Result of the evaluation	
Unit	%
Method selected	Survey, Counting sensors and speed/traffic management
Scale of measurement	The entire City, both city center and peri-urban areas
Periods for data collection	Before: 2024 After:2025
Additional comments	Overlap to SUMI

Elaborator Impact KPIs	
Name	4.1 Increase in use of zero emission modes 4.2 Reduction of emissions

	4.5 increase in quality-adjusted life years 4.6 Reduction in exposure to air and noise pollution
Result of the evaluation	
Unit	Tbd
Method selected	Various methods: • Surveys • Counting sensors and speed/traffic management (Parking counts, traffic counts, counting sensors on bikes about the number of trips)
Scale of measurement	The bike-related interventions contribute toward a long-term transition towards a multimodal and less car-based transport system in Trikala through improvements to safety (and sense of safety) for pedestrians and cyclists, encouraging the use of active modes.
Periods for data collection	continuous throughout the project
Additional comments	

Elaborator Impact KPIs	
Name	**3.2 Addressing safety risk for cycling and e-scooters** Increasing the use of cycling in the city brings increased risk for accidents for various road users. This KPIs counts the number of cities directly addressing the safety risks expected to increase due to the intervention.
Result of the evaluation	
Unit	Number
Method selected	surveys
Scale of measurement	Specific roads
Periods for data collection	Before:2024 After:2025
Additional comments	

Elaborator Impact KPIs	
Name	**3.3 Decrease of safety risks** Cities need to show how their interventions are expected to actively contribute to reducing safety risks. This is more a general indicator, it could be looking at safety for pedestrians, cyclists or VRUs, it's up to the city to define their safety impact.
Result of the evaluation	
Unit	%
Method selected	App for people's perception of near encounters / footage used from the OpenTrafficCam
Scale of measurement	Specific roads, specific intersections
Periods for data collection	Before:2024 After:2025
Additional comments	

Elaborator Impact KPIs	
Name	**4.1 Increase of Zero Emission modes** Use of transport should increase amongst the modes of transport that reduce the air pollution in the LL. This can be for example cycling, walking, e-scooter, public transport etc. Here it will be not necessary to measure the reduction in air pollution, but the increase of use for services that contribute
Result of the evaluation	
Unit	%
Method selected	Counting sensors and speed/traffic management
Scale of measurement	Specific intersections
Periods for data collection	Before:2024 After:2025
Additional comments	Min 5% increase All LL

SUM indicator	
Name	**4.10 Air pollutant emissions**

Result of the evaluation	Pollutants emitted by transport activities contribute to ambient air pollution and put significant pressures on the environment and human health. Significant policy efforts, although with differences across modes, have addressed transport-related air pollution in recent decades and have led to some improvements. The indicator measures the air pollutant emissions of all passenger and freight transport modes in the urban area. Emissions from the transport sector are regulated by vehicle emissions standards and fuel quality requirements.
Unit	Emission harm equivalent index [kg PM2.5 eq./cap per year]
Method selected	Counting sensors and speed/traffic management from TU data on total vehicle km (and trip behaviour). City database if existing.
Scale of measurement	City of Copenhagen – what is the hypothesis? (not measurable at intervention site level,but consider the intervention level – and potentially discuss the scaling up).
Periods for data collection	Before (2023-2024) and after (2025-2027) the interventions
Additional comments	Consider the availability and relevant location of the city’s air pollution sensors

Elaborator Impact KPIs	
Name	5.2 Focus group consultation
Result of the evaluation	
Unit	Number of focus groups
Method selected	Total focus groups: before and after the intervention
Scale of measurement	Municipality of Trikala
Periods for data collection	Before interventions (2024) and at the end of the project (2027)

Additional comments	

Elaborator Impact KPIs	
Name	**5.7 Intervention acceptance level** Acceptance of the intervention will mean the willingness of citizens to use the new products, services or spaces. The level suggests that we are looking at the proportion of people accepting it out of 100 citizens.
Result of the evaluation	
Unit	% of acceptance
Method selected	Survey (also through the SMARTA online application)
Scale of measurement	- Level of acceptance (% of users accept the interventions) - Usefulness level (% of users feeling the intervention is useful) - Willingness to change (% of users likely to change mobility behaviour)
Periods for data collection	Survey - Before (2024) and after (2025-2027) the interventions
Additional comments	

4. Data collection methods

WHAT YOU NEED TO DO NOW
For each indicator, choose the appropriate methods to collect data. Often, it is good to have both qualitative and quantitative data for an indicator so that you can get a more accurate picture. Below we provide a list of suggested qualitative and quantitative data collection methodologies. Each of them has guidelines attached. These guidelines should help collect data the right way to be used for evaluation purposes. Feel free to also choose others, these here are just suggestions. It might still be useful to look at the guidelines for our suggested methodologies, as they might be applicable for your own methodologies, too. 1. Select methodologies making sure every indicator has a method allocated. It is possible to use the same method, or the data collected for multiple indicators

2. Fill in the template "Data collection methodologies". Copy and paste as many as you need to fill one template for each methodology

Template:

Data collection methodology	
Name of the methodology	Parking counts, traffic counts
Type of data collected	Quantitative
Evaluation indicators addressed	2.1 Reduction of private car use by at least 10%
Resources and equipment needed	
Timeline for data collection	Before (2024) and after the interventions (2025)

Data collection methodology	
Name of the methodology	Quantitative data: Parking counts, traffic counts, counting sensors on bikes about the number of trips Qualitative data: questionnaire on user acceptance and active mobility modes
Type of data collected	Quantitative and qualitative
Evaluation indicators addressed	2.4 At least 5% increase of desired modal split
Resources and equipment needed	Bike sensors, on line questionnaire
Timeline for data collection	Before (2024) and after the interventions (2025)

Data collection methodology	
Name of the methodology	Interviews and/ or survey
Type of data collected	qualitative

Evaluation indicators addressed	3.2 Addressing Safety risk for cycling and/or e-scooters
Resources and equipment needed	
Timeline for data collection	Before (2024) and after the interventions (2025)

Data collection methodology	
Name of the methodology	Survey asking for people's perception of safety in specific areas of interventions Road data from smart crossings and bike lane sensors
Type of data collected	Qualitative and quantitative
Evaluation indicators addressed	3.3 Decrease of safety risks
Resources and equipment needed	On line questionnaire to conduct the survey, data monitoring system for the smart crossing and the bike lane sensors
Timeline for data collection	Before (2024) and after the interventions (2025)

Data collection methodology	
Name of the methodology	Counting sensors on bike use to measure the modal split before and after the interventions Static Sensors that measure the outdoor quality of air before and after the interventions located in specific places Public transport operation data (?)
Type of data collected	quantitative
Evaluation indicators addressed	4.1 at least 5% increase of use of zero emissions modes
Resources and equipment needed	Sensors to measure the use of bikes
Timeline for data collection	Before (2024) and after implementation of interventions (2025)

Data collection methodology	
Name of the methodology	Outdoor air quality sensors
Type of data collected	quantitative
Evaluation indicators addressed	4.10 Air pollutant emissions
Resources and equipment needed	Sensors that measure air pollution and CO2
Timeline for data collection	Once before interventions (2024) and regularly during the pilot

Data collection methodology	
Name of the methodology	Total number of stakeholders and citizens focus groups conducted before and after the interventions
Type of data collected	quantitative
Evaluation indicators addressed	5.2 at least 12 Focus groups consultation during the project
Resources and equipment needed	
Timeline for data collection	Before and after the implementation

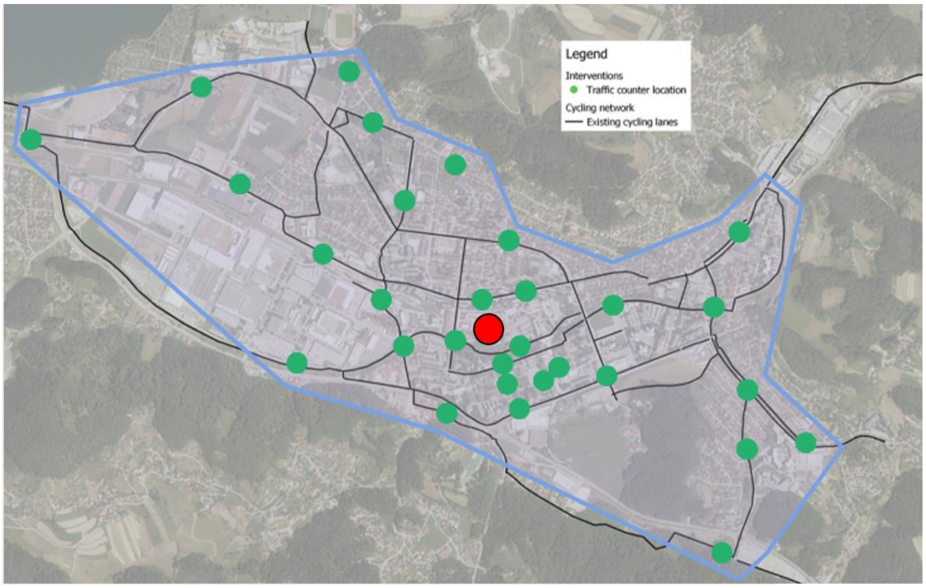
Data collection methodology	
Name of the methodology	A survey measuring: - Level of acceptance (% of users accept the interventions) - Usefulness level (% of users feeling the intervention is useful) - Willingness to change (% of users likely to change mobility behavior)
Type of data collected	quantitative

Evaluation indicators addressed	5.7 Intervention acceptance level
Resources and equipment needed	On line survey
Timeline for data collection	Before and after the interventions

Annex XVI: Evaluation Plan Velenje

1. Description of the intervention

WHAT YOU NEED TO DO NOW
Use the template to fill in the description about your intervention. Descriptions for each item in the table are found in Part 2 of the Evaluation Plan Framework.

Intervention description	
Overall description	Installation of a city-wide network of traffic cams, that will be used to track the impacts of the mobility hub intervention, change in modal split, increase safety perception among micromobility users and provide data for a data-driven creation and implementation of sustainable mobility initiatives in the future
Elements	Traffic cams
Main users	Micromobility users, high-school students, general public, local public authority
Boundaries	Area/Location of the installation
Area and location	

Intervention description	
Overall description	Implementation of a micromobility hub on the High-school premises – a secure personal bike locker/e-bike charging station.
Elements	Secure bike lock and e-charging
Main users	High-school students, general public
Boundaries	
Area and location	

2. Evaluation goal

WHAT YOU NEED TO DO NOW

You will need to fill a canvas of your Theory of Change. It is the same one we used for the workshop in Issy. Those are good starting points to complete and tidy up your Theory of Change. Pictures are uploaded on Sharepoint: Pictures from workshop in Issy

1. Download and print another canvas in your office OR use is digitally by downloading it on your computer and using PDF reader to fill the boxes Impact Canvas.pdf
2. Complete all sections, ensure that everything is well connected and there are no “free flowing” items on the canvas
3. Take a picture (Do not upload it for now)
4. Fill the information into the template “Theory of Change”. We highly recommend doing this after you have gone through the canvas and prioritised your project goals

Canvas

“Theory of Change”, download here : Impact Canvas.pdf

Pictures from Issy Workshop: Pictures from workshop in Issy

Template

Theory of change						
Challenge	Conflicts between micromobility and other road users					
Solution 1	Short term impact		Medium term impact		Long term impact	
Improve safety of vulnerable groups (smart traffic cams and potential infraction points)	Increased safety perception		Further increased safety perception	Collected data on crucial infraction points	Further increased safety perception	Data driven measures implemented on crucial infraction points
Solution 2	Short term impact		Medium term impact		Long term impact	
Data collection and monitoring	Established means of data collection and methodology		Clear data inputs for collection of data on crucial infraction points		Data driven measures to be implemented for development of safe sustainable mobility	Less accidents

Solution 3	Short term impact		Medium term impact		Long term impact	
Vision	Improved safety in pedestrian and cycling traffic, dangerous spots register, traffic calming measures, improved safety in school ways					

Theory of change						
Challenge	High share of cars in the modal split (high accident potential, low safety perception)					
Solution 1	Short term impact		Medium term impact		Long term impact	
Reduce the share of motorized traffic and increase the share of sustainable mobility amongsecondary school students	Increased safety perception	Increased awarenes on the importance of safe micromobility	Increased safety perception	Increased usage of sustainable mobility means	Further increased safety perception	Reduced share of motor vehicles in the LL
Solution 2	Short term impact		Medium term impact		Long term impact	
New means, modes and service solutions to optimize public space and mobility	New means of micromobility usage		Increased usage of sustainable mobility means	Reduce the car usage among high school students		Achieve the desired modal split in favour of sustainable mobility
Solution 3	Short term impact		Medium term impact		Long term impact	
Development of camera based smart traffic analysis	Understanding travel patterns		Established traffic flow patterns and visualization		Data-driven approach to for optimisation of traffic flows	
Vision	Increase the share of sustainable mobility modes, establishment of e-charging infrastructure, building of bike parking spots near public buildings					

Theory of change						
Challenge	Reducing GHG emissions from motorised traffic					
Solution 1	Short term impact		Medium term impact		Long term impact	
Promotion of alternatives	Increased awareness		Increased usage of		Improve air quality and	

to cars, oriented towards elementary and HS students	regarding the impacts of GHG emission on the environment		sustainable mobility means		decreased GHG emissions	
Solution 2	Short term impact		Medium term impact		Long term impact	
Solution 3	Short term impact		Medium term impact		Long term impact	
Vision	Cleaner environment, building of parking spots for bikes near public buildings					

3. Evaluation indicators

WHAT YOU NEED TO DO NOW

Pick the indicators for your project. For the impact KPIs, looks which ones are relevant for your city and see which element of your intervention is best suited in measuring this data. If there is a mandatory KPI but you don't have an impact that matched that outcome, you might need to consider adding elements to your solution that will create that impact. And it is always good to talk to the project management about this:
Jason (ICCS), Hans (Technical manager), Monica & James (WP7 leaders)

1. Identify indicators and write them next to the impact on your canvas
2. If you have KPIs that are mandatory for your city but no impact to address them, you will need to return to the previous step and add elements to your intervention that will enable you to achieve those outcomes of the KPIs
3. If you are very unsure on how to address this KPIs, please reach out to the project management team with contacts listed above
4. For the SUMIs, make sure to pick at least one per evaluation area
5. Outside of that, pick as many indicators as you think is useful. Keep in mind that you will need to evaluate the impact of your intervention in WP7, so the more indicators and data you collect, the more secure is a successful evaluation in the end
6. Every indicator has a fully detailed description provided in the Annex
7. Feel free to think of other indicators not part of the provided list. Please use the "light blue" template when describing them
8. Once you have decided on the indicators, will the template "Evaluation indicator". Copy past as many templates as you need and fill one template for each indicator, including the KPIs. Make sure to keep the headers colour coded:
   - dark blue = impact KPIs
   - light purple = SUMI
   - light blue = Other indicators
9. Take a second picture of the canvas (including the indicators) and upload it into the indicated area on your City Plan

Templates:

Elaborator Impact KPIs (workplan)	
Name	2.1 Reduction of private car use
Result of the evaluation	
Unit	%
Method selected	Survey, **1Public/Private Services database**
Scale of measurement	Area of implementation
Periods for data collection	Before and after implementation of the micromobility hub intervention
Additional comments	

Elaborator Impact KPIs (workplan)	
Name	2.4 5% increase of desired modal split
Result of the evaluation	
Unit	%
Method selected	Survey, Counting sensors and speed/traffic management, **Public/Private Services database**
Scale of measurement	LL
Periods for data collection	Before and after implementation
Additional comments	

Elaborator Impact KPIs (workplan)	
Name	3.3 Decrease safety risks
Result of the evaluation	
Unit	%
Method selected	Survey, Counting sensors and speed/traffic management
Scale of measurement	LL
Periods for data collection	Before and after implementation
Additional comments	

Elaborator Impact KPIs (workplan)	
Name	4.1 Increase of use of zero emission modes
Result of the evaluation	

Unit	%
Method selected	Survey, Counting sensors and speed/traffic management, **Public/Private Services database**
Scale of measurement	LL Area
Periods for data collection	Before and after implementation
Additional comments	

Elaborator Impact KPIs (workplan)	
Name	4.2 Reduction of emission
Result of the evaluation	
Unit	%
Method selected	Survey, **Public/Private Services database**
Scale of measurement	LL area
Periods for data collection	Before and after implementation
Additional comments	

Elaborator Impact KPIs (workplan)	
Name	4.6 Increase of quality-adjusted life years
Result of the evaluation	
Unit	%
Method selected	Survey
Scale of measurement	LL
Periods for data collection	Before and after implementation
Additional comments	

Elaborator Impact KPIs (workplan)	
Name	4.5 Reduction in exposure to air and noise pollution
Result of the evaluation	
Unit	%
Method selected	Survey
Scale of measurement	LL
Periods for data collection	Before and after implementation
Additional comments	

Elaborator Impact KPIs (workplan)	
Name	5.1 Toolkit adaptation and deployment
Result of the evaluation	
Unit	%
Method selected	12
Scale of measurement	Intervention
Periods for data collection	During the project
Additional comments	

Elaborator Impact KPIs (workplan)	
Name	1.2. Focus group consultations
Result of the evaluation	
Unit	Number of focus groups
Method selected	Workshop
Scale of measurement	LL
Periods for data collection	Before and after implementation
Additional comments	

SUM indicator	
Name	2.7 Modal split
Result of the evaluation	
Unit	Passenger-kilometre (pkm) for passenger transport performance.
Method selected	Survey, **Public/Private Services database,** Counting sensors and speed/traffic management
Scale of measurement	LL
Periods for data collection	Before and after implementation
Additional comments	

SUM indicator	
Name	4.13 Greenhouse gas emissions
Result of the evaluation	

Unit	Tonne CO2 equivalent emissions by urban transport per annum per capita
Method selected	Surveys, CO2 sensors and air pollution sensors , **Public/Private Services database**
Scale of measurement	City level/intervention level and scaling up
Periods for data collection	Before and after intervention
Additional comments	We'll use software for calculations of GHG emissions

Another indicator	
Name	3.9 Conflicts
Result of the evaluation	
Unit	# of conflicts
Method selected	Survey, Workshop
Scale of measurement	LL
Periods for data collection	Before and after implementation
Additional comments	

Another indicator	
Name	3.11 Perceived safety
Result of the evaluation	
Unit	Subjective scale (likert or other ordinal scales can be used)
Method selected	Workshop, survey
Scale of measurement	Intervention level
Periods for data collection	Before and after implementation
Additional comments	

Another indicator	
Name	5.7 Intervention acceptance level
Result of the evaluation	
Unit	% of acceptance
Method selected	Workshop, Survey
Scale of measurement	LL area
Periods for data collection	After implementation

Additional comments	

4. Selecting data collection methods

WHAT YOU NEED TO DO NOW
For each indicator, choose the appropriate methods to collect data. Often, it is good to have both qualitative and quantitative data for an indicator so that you can get a more accurate picture. Below we provide a list of suggested qualitative and quantitative data collection methodologies. Each of them has guidelines attached. These guidelines should help collect data the right way to be used for evaluation purposes. Feel free to also choose others, these here are just suggestions. It might still be useful to look at the guidelines for our suggested methodologies, as they might be applicable for your own methodologies, too. 1. Select methodologies making sure every indicator has a method allocated. It is possible to use the same method, or the data collected for multiple indicators 2. Fill in the template "Data collection methodologies". Copy and paste as many as you need to fill one template for each methodology

Template:

Data collection methodology	
Name of the methodology	Questionnaires
Type of data collected	Quantitative
Evaluation indicators addressed	2.4 5% increase of desired modal split, 2.1 Reduction of private car use 3.3 Decrease safety risks 4.1 Increase of use of zero emission modes 4.2 Reduction of emission 4.5 Increase of quality-adjusted life years Modal split 3.11 Perceived safety 5.7 Intervention acceptance level
Resources and equipment needed	Survey tool

Timeline for data collection	Before and after implementation

Data collection methodology	
Name of the methodology	Counting sensors and cameras
Type of data collected	quantitative
Evaluation indicators addressed	2.4 5% increase of desired modal split 3.3 Decrease safety risks 4.1 Increase of use of zero emission modes 4.5 Increase of quality-adjusted life years 4.2 Reduction of emission 4.6 Reduction in exposure to air and noise pollution Modal split 3.9 Conflicts
Resources and equipment needed	Counting sensors and cameras, data platform
Timeline for data collection	During LL activities

Data collection methodology	
Name of the methodology	Survey
Type of data collected	Quantitative, Qualitative
Evaluation indicators addressed	3.3 Decrease safety risks 4.2 Reduction of emission 3.9 Conflicts 5.7 Intervention acceptance level
Resources and equipment needed	PM allocation, survey tools,
Timeline for data collection	Before and afterimplementation

Data collection methodology	
Name of the methodology	12 Counting sensors and camera-based traffic management for bikes
Type of data collected	Quantitative

Evaluation indicators addressed	2.4 5% increase of desired modal split 3.3 Decrease safety risks 4.1 Increase of use of zero emission modes Modal split 5.1 Toolkit adaptation and deployment
Resources and equipment needed	Traffic cameras and connectivity infrastruxture, data sharing platform
Timeline for data collection	Before and after

Data collection methodology	
Name of the methodology	Workshop
Type of data collected	Qualitative
Evaluation indicators addressed	3.9 Conflicts 3.11 Perceived safety 5.2 Focus group consultations 5.7 Intervention acceptance level
Resources and equipment needed	Interactive workshop tools, pen, paper, digital media
Timeline for data collection	Before and after implementation

Data collection methodology	
Name of the methodology	**Public/Private Services database**
Type of data collected	Quantitative
Evaluation indicators addressed	2.1 Reduction of private car use 4.1 Increase of use of zero emission modes 4.2 Reduction of emission 4.13 Greenhouse gas emissions Modal split
Resources and equipment needed	Before and after
Timeline for data collection	

Data collection methodology

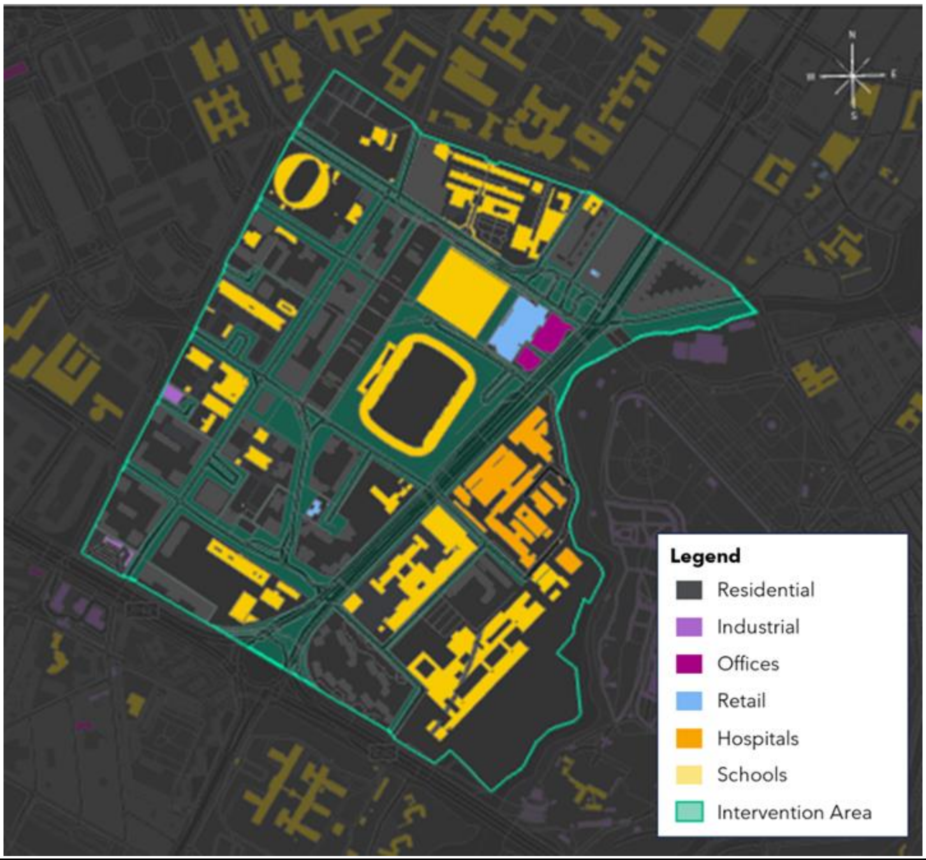
Name of the methodology	CO_2 sensors and air pollution sensors
Type of data collected	Quantitative
Evaluation indicators addressed	4.5 Reduction in exposure to air and noise pollution 4.13 Greenhouse gas emissions
Resources and equipment needed	
Timeline for data collection	

Annex XVII: Evaluation Plan Zaragoza

1. Description of the intervention

WHAT YOU NEED TO DO NOW
Use the template to fill in the description about your intervention. Descriptions for each item in the table are found in Part 2 of the Evaluation Plan Framework.

Intervention description	
Overall description	Data collection and monitoring for the re-design of public space. Develop and deploy an on-demand diagnostic mobility lab for in-situ and non-intrusive mobility evaluation at local level.
Elements	The main elements of the intervention consist of monitoring devices such as sensors to measure foot, bike, and e-scooter flows, vehicle volumes and speed, exposition to pollutants and noise.
Main users	The direct user of the collected and monitored data will be the Municipality of Zaragoza, who will be able to use it in the re-design and new distribution of the public space around the “Nueva Romareda” project. The end users will be the citizens of Zaragoza.
Boundaries	The location of the Living Lab will be the surroundings of the New Romareda Stadium, where the Miguel Servet Hospital, various schools and 1 elderly house are found within a 500-meter radius. The area is also characterised by the convergence of pedestrian, bike and traffic flows and is served by urban buses, tram, and shared services. The ambition is to test and co-design safe and universal approaches at neighbourhood level, balancing the daily mobility needs and patterns with the big events scheduled in the stadium. The boundaries of this area are the Street Domingo Miral, the Huerva river, Ronda de la Hispanidad and Street Condes de Aragón.

Area and location	

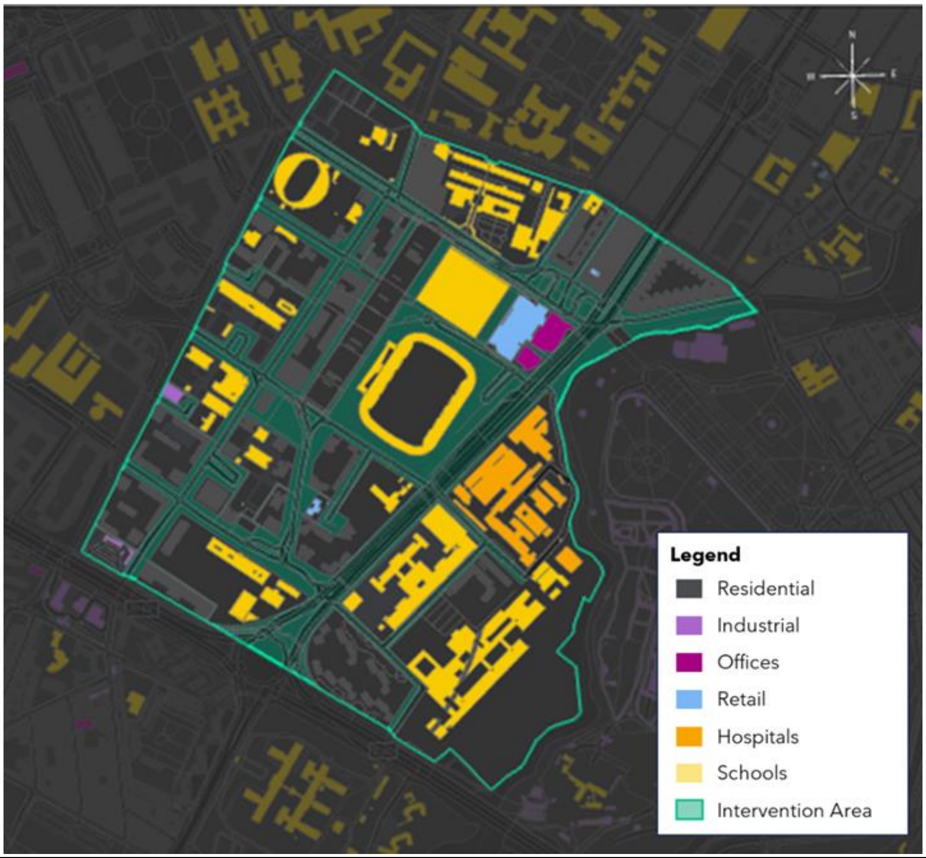
Intervention description	
Overall description	Deploy a station for e-bikes and scooters to re-assess public space and improve road safety.
Elements	The two main elements of the intervention will be: - The installation of the e-bikes and scooters station. - App for the geo-localization of road safety risks and crashes through the installation of monitoring devices attached to these vehicles.
Main users	Students or workers of the schools or hospital inside the intervention area. Yet to be defined further on the project.
Boundaries	CEIP Cesáreo Alierta, CEIP Doctor Azúa, CEIP Cesar Augusto, CEIP Margarita Salas, Colegio Romareda Agustinos Recoletos, IES Miguel Catalán, or Miguel Servet Hospital.

Area and location	

Intervention description	
Overall description	Online applications, Artificial Intelligence and Digital Twins.
Elements	Perform pedestrian microsimulation to evaluate behaviour before and after the interventions. Include movement on sidewalks for different type of pedestrians, interaction between pedestrians and traffic on crosswalks, boarding at public transport stops and the influence of physical obstacles.
Main users	Pedestrians and cyclists.
Boundaries	Street Jerusalén between P. Isabel la Católica and Street Juan II de Aragón.

Area and location	

Intervention description	
Overall description	Participatory research and engagement of vulnerable to exclusion groups through in-person surveys about road safety conditions in order to enrich the diagnostic with the user perception.
Elements	Conduct in-person surveys for data collection (e.g., about road safety conditions) that will complement the diagnostic mobility lab.
Main users	The direct user of the collected and monitored data will be the Municipality of Zaragoza, who will be able to use it in the re-design and new distribution of the public space around the "Nueva Romareda" project. The end users will be the citizens of Zaragoza.
Boundaries	The participatory research will be done in the area drawn between Street Domingo Miral, the Huerva river, Ronda de la Hispanidad and Street Condes de Aragón.

Area and location	

2. Evaluation goal

WHAT YOU NEED TO DO NOW
You will need to fill a canvas of your Theory of Change. It is the same one we used for the workshop in Issy. Those are good starting points to complete and tidy up your Theory of Change. Pictures are uploaded on Sharepoint: Pictures from workshop in Issy 1. Download and print another canvas in your office OR use is digitally by downloading it on your computer and using PDF reader to fill the boxes Impact Canvas.pdf 2. Complete all sections, ensure that everything is well connected and there are no "free flowing" items on the canvas 3. Take a picture (Do not upload it for now) 4. Fill the information into the template "Theory of Change". We highly recommend doing this after you have gone through the canvas and prioritised your project goals

Canvas

"Theory of Change", download here : Impact Canvas.pdf

Pictures from Issy Workshop: Pictures from workshop in Issy

Theory of change			
Challenge	**Road deaths increase and safety issues:** transport intermodality causes unsafety issues for certain groups (bikes, pedestrians, vulnerable groups, etc.). Moreover, the ban on cycling on pavements created insecurity for citizens, and this led to a decrease in the number of cycling trips from 70,000 to 50,000 in the last year. In addition, there is a lack of clear regulations on the use of bicycles in areas shared with pedestrians.		
Solution	Short term impact	Medium term impact	Long term impact
Apply innovative planning, design and implementation approaches	Start co-creation processes with the stakeholders, fostering participation and engagement of diverse groups	Re-assess road and public space quality responding to needs of diverse groups.	Reduction of road accidents and deaths, as well as illness associated with pollution. Thus, increasing safety perception and confidence in all-ages citizens for active mobility.
Vision	Reduce road safety risks, reducing exposure to air and noise pollution and the perceived feeling of unsafety for pedestrians and cyclists.		

Theory of change						
Challenge	**Climate change:** the city still needs to reach acceptable levels of carbon emissions and energy savings, and traffic control tasks need to play a greater role in order to adapt regulation to the energy demands. Vehicle reduction is necessary for a model of environmental sustainability in the city.					
Solution	Short term impact		Medium term impact		Long term impact	
The implementati on of active mobility modes in the most	Reconfigurati on in the use of public space due to the new active modes.	Reduce car-dependence. Example: in families coming to schools to	Less traffic volumes, due to the reduction of the through-traffic.	Decrease in the level of exposition of vulnerable population to	Developing of new infrastructure to connect the	Reduction of carbon emissions.

vulnerable areas of the city.		drop off or pick up their children.		emissions and noise.	active mobility modes.		
Vision	T The city will achieve the compromises set on the NetZeroCities Mission. Contribute to the objectives of the Climate Neutral and Smart Cities Mission by accelerating the transition towards climate neutrality in cities through the promotion of zero-emission, shared, active and human-centred mobility.						

3. Evaluation indicators

WHAT YOU NEED TO DO NOW

Pick the indicators for your project. For the impact KPIs, looks which ones are relevant for your city and see which element of your intervention is best suited in measuring this data. If there is a mandatory KPI but you don't have an impact that matched that outcome, you might need to consider adding elements to your solution that will create that impact. And it is always good to talk to the project management about this:
Jason (ICCS), Hans (Technical manager), Monica & James (WP7 leaders)

1. Identify indicators and write them next to the impact on your canvas
2. If you have KPIs that are mandatory for your city but no impact to address them, you will need to return to the previous step and add elements to your intervention that will enable you to achieve those outcomes of the KPIs
3. If you are very unsure on how to address this KPIs, please reach out to the project management team with contacts listed above
4. For the SUMIs, make sure to pick at least one per evaluation area
5. Outside of that, pick as many indicators as you think is useful. Keep in mind that you will need to evaluate the impact of your intervention in WP7, so the more indicators and data you collect, the more secure is a successful evaluation in the end
6. Every indicator has a fully detailed description provided in the Annex
7. Feel free to think of other indicators not part of the provided list. Please use the "light blue" template when describing them
8. Once you have decided on the indicators, will the template "Evaluation indicator". Copy past as many templates as you need and fill one template for each indicator, including the KPIs. Make sure to keep the headers colour coded:
   - dark blue = impact KPIs
   - light purple = SUMI
   - light blue = Other indicators
9. Take a second picture of the canvas (including the indicators) and upload it into the indicated area on your City Plan

Mobility Planning

Elaborator Impact KPIs (workplan)	
Name	**1.1 Expand interventions beyond the LL**
Result of the evaluation	
Unit	Number
Method selected	**Description of intentions for scaling.** It is required to present an action plan on how the intervention will be scaled including: Size increase in % of area covered by intervention, time frame, monitoring and evaluation plan. It might be that for the intervention's expansion, the city decides to only scale one element of the solution to begin with. It will be required to describe in the implementation plan, how this is indented to be scaled including other relevant elements of the solution.
Scale of measurement	City scale
Periods for data collection	Once, at the end of the project
Additional comments	-

SUM indicator	
Name	**1.5 Opportunity for active mobility**
Result of the evaluation	
Unit	% (share of road length adapted for active mobility, walking or cycling)
Method selected	Public/Private Services database
Scale of measurement	Intervention scale
Periods for data collection	After implementation
Additional comments	-

Connected and smart mobility

Elaborator Impact KPIs (workplan)	
Name	**2.1 Reduction of private car use**
Result of the evaluation	
Unit	%
Method selected	Simulation SW, digital tool, Traffic counts.
Scale of measurement	Intervention scale
Periods for data collection	Before and after implementation

Additional comments	-

Elaborator Impact KPIs (workplan)	
Name	**2.2 Deployment of Zero Emission and shared mobility services**
Result of the evaluation	
Unit	Number
Method selected	CO2 sensors, air quality sensors
Scale of measurement	Intervention scale
Periods for data collection	After implementation
Additional comments	-

Elaborator Impact KPIs (workplan)	
Name	**2.3 75% user acceptance for zero emission services 3 75% user acceptance or zero emission services**
Result of the evaluation	
Unit	%
Method selected	Civic meetings, Interview, Workshop, Survey
Scale of measurement	Intervention scale
Periods for data collection	After implementation
Additional comments	-

Elaborator Impact KPIs (workplan)	
Name	**2.4 5% increase of desired modal split**
Result of the evaluation	
Unit	%
Method selected	Simulation SW, digital tool, Counting sensors and speed/traffic management, public transport operational data
Scale of measurement	Intervention scale
Periods for data collection	Before and after implementation
Additional comments	-

SUM indicator	
Name	**2.8 Modal split**

Result of the evaluation	
Unit	Tonne-kilometre (tkm) for freight transport. Passenger-kilometre (pkm) for passenger transport performance.
Method selected	Survey, Parking counts, Counting sensors and speed/traffic management, Road data from controlled intersection & related devices
Scale of measurement	Intervention scale
Periods for data collection	Before and after implementation
Additional comments	-

Safety

Elaborator Impact KPIs (workplan)	
Name	**3.3 Decrease of safety risks**
Result of the evaluation	
Unit	%
Method selected	Interview, Survey, Road data from device, Simulation Software, Recording device in the vehicle, Floating car data, Counting sensors and speed/traffic management, Road data from controlled intersection & related devices
Scale of measurement	Intervention scale
Periods for data collection	Before and after the implementation
Additional comments	-

Elaborator Impact KPIs (workplan)	
Name	**3.4 Deploy cutting-edge safety evaluation and prediction tools**
Result of the evaluation	
Unit	Number
Method selected	Simulation SW, digital tool
Scale of measurement	Intervention scale
Periods for data collection	Application minimum once, at any point throughout the project
Additional comments	-

SUM indicator	
Name	3.7 Traffic safety active modes
Result of the evaluation	

Unit	Number of deaths
Method selected	Public and Private service data base
Scale of measurement	City or Intervention scale
Periods for data collection	Over the last 3 years
Additional comments	-

Environment

Elaborator Impact KPIs (workplan)	
Name	**4.1 Increase of use of zero emission modes**
Result of the evaluation	
Unit	%
Method selected	Interview, Survey, Counting sensors and speed/traffic management, Public transport operational data
Scale of measurement	Intervention scale
Periods for data collection	Before and after implementation
Additional comments	-

Elaborator Impact KPIs (workplan)	
Name	**4.2 Reduction of emissions**
Result of the evaluation	
Unit	%
Method selected	Interview, Survey, Counting sensors and speed/traffic management, Public transport operational data, CO2 sensors and air pollution sensors
Scale of measurement	Intervention scale
Periods for data collection	Before and after implementation
Additional comments	-

Elaborator Impact KPIs (workplan)	
Name	**4.5 Increase of quality-adjusted life years**
Result of the evaluation	
Unit	%
Method selected	Interview, Survey, Counting sensors and speed/traffic management, Public transport operational data, CO2 sensors and air pollution sensors
Scale of measurement	Intervention scale

Periods for data collection	Before and after implementation
Additional comments	-

Elaborator Impact KPIs (workplan)	
Name	**4.6 Reduction in exposure to air and noise pollution**
Result of the evaluation	
Unit	Number
Method selected	Interview, Survey, Counting sensors and speed/traffic management, Public transport operational data, CO2 sensors and air pollution sensors
Scale of measurement	Intervention scale
Periods for data collection	Before and after implementation
Additional comments	-

SUM indicator	
Name	4.10 Air pollutant emissions
Result of the evaluation	
Unit	Emission harm equivalent index [kg PM2.5 eq./cap per year]
Method selected	Simulation software and digital tools, Counting sensors and speed/traffic management, Public and Private service data base, CO2 sensors and air pollution sensors
Scale of measurement	Intervention scale
Periods for data collection	before and after the interventions have been installed
Additional comments	-

SUM indicator	
Name	4.13 Greenhouse gas emissions (GHG)
Result of the evaluation	
Unit	Tonne CO2 equivalent emissions by urban transport per annum per capita
Method selected	Interviews, Survey, Simulation software and digital tools, Counting sensors and speed/traffic management, Public and Private service data base, CO2 sensors and air pollution sensors.

Scale of measurement	Intervention scale
Periods for data collection	Before and after the interventions have been installed
Additional comments	-

Social

Elaborator Impact KPIs (workplan)	
Name	**5.1 Toolkit adoptation and deployment**
Result of the evaluation	
Unit	Number of toolkits adopted and deployed
Method selected	1. Before: explain the purpose in using the selected toolkit and, its relationship with the intervention. 2. During: show evidence of the usage of the toolkit, where and how it is used. 3. After: show the results obtained and its usage for active participation, data platform, and visualization tool.
Scale of measurement	Intervention scale
Periods for data collection	Once during the project
Additional comments	-

Elaborator Impact KPIs (workplan)	
Name	**5.2 Focus group consultation**
Result of the evaluation	
Unit	Number of focus groups
Method selected	Civic meetings, Interview, Workshop, Survey
Scale of measurement	According to the stakeholders' map
Periods for data collection	Once during the project
Additional comments	-

SUM indicator	
Name	**1.7 Quality of public spaces**
Result of the evaluation	
Unit	% of satisfaction
Method selected	Survey
Scale of measurement	Intervention scale

Periods for data collection	Once, to rate the perceived satisfaction.
Additional comments	-

4. Data collection methods

WHAT YOU NEED TO DO NOW
For each indicator, choose the appropriate methods to collect data. Often, it is good to have both qualitative and quantitative data for an indicator so that you can get a more accurate picture. Below we provide a list of suggested qualitative and quantitative data collection methodologies. Each of them has guidelines attached. These guidelines should help collect data the right way to be used for evaluation purposes. Feel free to also choose others, these here are just suggestions. It might still be useful to look at the guidelines for our suggested methodologies, as they might be applicable for your own methodologies, too. 1. Select methodologies making sure every indicator has a method allocated. It is possible to use the same method, or the data collected for multiple indicators 2. Fill in the template “Data collection methodologies”. Copy and paste as many as you need to fill one template for each methodology

Data collection methodology	
Name of the methodology	**Methodologies:Civic Surveymeetings, Interview Survey, Interview Workshops Workshops**
Type of data collected	Acceptance and perception
Evaluation indicators addressed	2.3 and 5.2
Resources and equipment needed	Either of the following: PAPI (Paper And Pencil Interviewing), CAPI (Computer Assisted Personal Interviewing), CATI (Computer Assisted Telephone Interviewing) CAWI (Computer Assisted Web Interviewing).
Timeline for data collection	Once, or before and after the intervention.

Data collection methodology	
Name of the methodology	**Methodologies: Survey, Road data from device, Counting sensors and speed/traffic management, CO2 and air pollution sensors, Public transport operational data**
Type of data collected	Quantitative
Evaluation indicators addressed	4.1, 4.2, 4.5, 4.6.
Resources and equipment needed	Diagnostic toolkit
Timeline for data collection	Once, or before and after the intervention.

Data collection methodology	
Name of the methodology	**Road data from device**
Type of data collected	Quantitative
Evaluation indicators addressed	3.3
Resources and equipment needed	Diagnostic toolkit
Timeline for data collection	Once, or before and after the intervention.

Data collection methodology	
Name of the methodology	**Simulation software and digital tools**
Type of data collected	Quantitative
Evaluation indicators addressed	2.4, 3.4, 4.10, 4.13
Resources and equipment needed	Diagnostic toolkit
Timeline for data collection	Once, or before and after the intervention.

Data collection methodology	
Name of the methodology	**Recodring devices on vehicles**
Type of data collected	Quantitative

Evaluation indicators addressed	3.3,
Resources and equipment needed	Diagnostic toolkit
Timeline for data collection	Once, or before and after the intervention.

Data collection methodology	
Name of the methodology	**Floating car data**
Type of data collected	Quantitative
Evaluation indicators addressed	3.3,
Resources and equipment needed	Diagnostic toolkit
Timeline for data collection	Once, or before and after the intervention.

Data collection methodology	
Name of the methodology	**Parking counts**
Type of data collected	Quantitative
Evaluation indicators addressed	2.8
Resources and equipment needed	Diagnostic toolkit
Timeline for data collection	Once, or before and after the intervention.

Data collection methodology	
Name of the methodology	**Public / Private services database**
Type of data collected	Quantitative
Evaluation indicators addressed	4.10, 4.13
Resources and equipment needed	Diagnostic toolkit
Timeline for data collection	Once, or before and after the intervention.

Data collection methodology

Name of the methodology	**Road data from controlled intersection and related devices**
Type of data collected	Quantitative
Evaluation indicators addressed	2.8
Resources and equipment needed	Diagnostic toolkit
Timeline for data collection	Once, or before and after the intervention.