LOOPER

LEARNING LOOPS IN THE PUBLIC REALM

WP6. Learning Living Lab – Verona

T6.4. Implementation of measures and monitoring

Deliverable D6.4

Verona Looper Living Lab evaluation report including learning outcomes and policy transfer

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PUBLISHABLE SUMMARY

The Verona Looper Living Lab worked on a wide area that comprises more neighbourhoods in the southern part of Verona (Italy). The Looper Living Lab successfully implemented two loops of the Looper co-creation process with the aim of solving criticalities related to poor air quality and noise pollution. Different stakeholders - i.e. policymakers, NGOs, citizens' groups, citizens, residents, final users - were involved in the process to obtain the best possible solutions to be implemented to trigger urban transformations.

The Verona Looper Living Lab completed a first full loop and reached the implementation stage of the second loop. During the first loop participants chose the criticalities - and linked locations - on which to work, and also decided which sensors and tools to use. The data collection took place using official sensors - quantitative data - combined with some participatory sensing tools - qualitative and quantitative data. The visualisation of collected data confirmed a general condition of poor air quality, but also demonstrated how noise levels, even if high, were within law limits and how - opposite to people perception - air quality levels were evenly poor in other parts of the city. Participants during the co-design activity of the first loop proposed mainly punctual solutions and few longer-term solutions; during the evaluation only small punctual solutions - that were of quick implementation - were chosen and some were implemented. After the monitoring campaign, that took place during the implementation of the chosen ideas, it was possible to see how punctual solution - that want to solve 'individual' criticalities – did not produce benefits to the urban environment.

Since the solutions implemented during the first loop did not produce "measurable" results, participants decided to find new possible ideas to solve the already found criticalities. This resulted in a quick scoping of issues - i.e. the time for participants to decide to keep working on the same criticalities - and in the used of data from the monitoring campaign with double meaning of (i) monitoring of the ideas implemented from the first loop, and (ii) data collection to analyse the state of affairs of the area for the second loop. If from a monitoring point of view data showed no benefits from the implemented ideas, the same data - analysed in a data collection on the area - allowed participants to better understand why the co-designed ideas need to be community-oriented. Needing to think at community level, participants decided to re-evaluate the longer-term ideas proposed – and discarded - during the first loop. The co-design for the second loop then resulted in an official document, endorsed by the Comune di Verona, that presented four long-term solutions that can work as pilot cases to produce positive urban transformations to reduce pollutant levels.

Overall, it is possible to say that the Verona Looper Living Lab implemented a successful co-creation process, and that different things were learned on how to further improve the process.

Firstly, it was possible to see how the first loop of the co-creation process might be needed to level the knowledge basis of different stakeholders, this then allows the co-design of better ideas during the second loop. The process needs to be flexible at all times, always taking into account the socio-cultural context of its application e.g. the need to skip some activities in following loops, different sensors and tools to collect data depending on tackled issues, different strategies for co-design depending on participants. Furthermore, the flexibility of the process allows its implementation in any context.

Since different stakeholders' groups are working together, there is the need to have neutral organisers that can facilitate the dialogue between parties. This helps in reducing contrasts - that might be pre-existing ones and not raised during the co-creation process - by explaining all different points of view raised on the same topic.

Data collection can be another key point in order to have a successful co-creation process. This because qualitative and quantitative data can help to lower the gap between real and perceived situation. Depending on the involved stakeholders, data can be qualitative or a mix of qualitative and quantitative, still it is important to know what is the perception of the urban environment in which the Looper Living Lab will be working.

In Verona, where the project area comprised half of the city, it was proved that small punctual solution - with an individualistic view – are not successful in triggering urban transformation, while longer-term

solutions can create a better community feeling and can create a more liveable urban environment. Moreover, the implementation of longer-term solutions can help to keep the process going on even after the conclusion of the 'official' Looper Living Lab.

In Verona it was also possible to see the importance of making a socio-cultural analysis of the project area to better understand who the possible target groups are to be involved in the process. This allows a reduction of hard-to-reach groups, since organisers would better know who can be interested in participating.

To conclude, there was also some learning that took place at different levels, e.g. policymakers better understood citizens' needs and citizens gained knowledge on the processes that are to be followed when designing urban transformations. This learning allowed a more inclusive process because there was a better sharing of knowledges.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

1. INTRODUCTION

1.1. Objective of D6.4

The objective of this deliverable is to evaluate the Verona Looper Living Lab, and to give an overview of the learnings that took place during nearly three years of co-creation process. Furthermore, the aim is to derive policy recommendations form the experience of the living lab.

1.2. Related deliverables

This document uses the evaluation framework described in Deliverable 4.2 Framework for Monitoring and Evaluation of the Looper Living Labs. Deliverable 6.4 is the final deliverable in work package 6 (WP6) and builds on the previous deliverables that describe the different phases of co-creation in the Living Lab (D6.1, D6.2a, D6.2b, D6.3a, D6.3b). Similar deliverables can be found on the Looper Living Labs in Brussels and Manchester in work packages 5 and 7, respectively.

2. EVALUATION

2.1. Looper Living Lab activities evaluation

This section provides a first lookout on the activities done by the Verona Looper Living Lab. Both tables and open questions are used to collect data and evaluate the process undertaken.

2.1.1. Verona Looper Living Lab logs

The following tables - based on the templates from D4.2 evaluation summary - cover both the activities done with participants of the LLL, but also the activities done by organisers to set up the lab and to allow the implementation of the interventions.

The "Event log" table shows all the different activities undertaken during the Verona Living Lab experience, from the set up to the organisation needed for the long-term implementation for the second loop. The "Workshops' learning" gives a summary of what participants and stakeholders learnt during each of the workshops undertaken by the Looper Living Lab.

The "Intervention log" table explains which ideas were chosen for implementation, and where/how to implement it. The "Impact assessment template" table shows what criticalities were to be solved with each intervention.

Event log

FIRST LOOP EVENT LOG						
Title & purpose of event	**Workshop #**	**Date**	**Content**	**No. of participants**		**Key Results**
				Citizens	**Policymakers**	
Preliminary meeting	Partners meeting	6th Jul 2017	Meeting to know the other partners and to start to define a common approach on how to proceed with the project	0	8	Definition of common approach
Preliminary meeting	Citizen's meeting	19th Jul 2017	Meeting to introduce the project to citizens, and to start to see what they would expect from a project like the LOOPER one	20	1	LOOPER's expectations seen by stakeholders understood
Preliminary meeting	Partners meeting	4th Oct 2017	Meeting with the partners to start to define the timetable for the different stages of the project. Definition of who would have done what during the project	0	5	Timetable definition
Preliminary meeting	Partners meeting	8th Nov 2017	Conclusion of the preliminary phase and organisation of the project presentation	0	5	Project presentation organised
Project presentation	Project presentation	22nd Nov 2017	Public project presentation during which the Università Iuav di Venezia, Legambiente Verona and the alderwoman for the Environment of the Comune di Verona presented the project and asked for adhesion to all stakeholders.	60	3	Project presented

Title & purpose of event	Workshop #	Date	Content	No. of participants Citizens	No. of participants Policymakers	Key Results
			FIRST LOOP EVENT LOG			
Scoping of issues	Workshop #1	12th Dec 2017	During the first workshop some lectures on pollutants and sensors where given to citizens to give them the necessary knowledge to obtain results during the project. Later during the workshop they started with the scoping of issues by finding the most critical areas and the places where they thought it was mostly polluted. The first Air Monitor for NO2 sensor was given to participants.	30	1	First issues defined
Scoping of issues	Workshop #2	24th Jan 2018	The scoping of issues continued from the first workshop. During this meeting citizens were called to consider not only critical areas, but also if it was possible to implement something or not. Stakeholders started to define where to position sensors for the monitoring campaign, and who was available to use and position the sensors. Official sensors position was defined and the first two noise boxes were given to participants.	20	2	Measuring spots defined
Scoping of issues	Workshop #3	7th Feb 2018	During this meeting it was defined where to position the sensors and who wanted to use the ones available for the participatory sensing. A lecture on how to use the geotagging tool was given to participants.	20	2	Final definition of issues and measuring sports
Data visualisation dashboard presentation	Press conference	12th Jul 2018	Presentation of the data visualisation dashboard to allow participants to see the data they collected autonomously, and to see the data collected with official sensors positioned where they asked for.	0	5	Presentation of the visualisation dashboard
Co-design organisation	Partners meeting	14th Sep 2018	Meeting to organise the co-design stage and meetings.	0	4	Timeline and approach for the co-design defined
Co-design	Workshop #4	5th Oct 2018	The workshop started with a visualisation of the data collected with participants. This helped to make the first comments to understand if the data collected corresponded to their perception and what they wanted to focus on from this point forward. The first ideas on what mitigation solutions to implement were proposed. To conclude the meeting the online co-design tool have been presented to allow people to collect ideas outside of the meetings as well.	10	1	Data collected visualised with stakeholders and first ideas proposed
Co-design	Workshop #5	17th Oct 2018	After seeing the ideas proposed during the previous meeting, the ones proposed online were presented. The meeting after went on by collecting other ideas.	10	1	Definition of some ideas to be implemented
Co-design	Workshop #6	31st Oct 2018	This last co-design meeting saw a recap of all the ideas proposed in the previous workshops and later went on with a confrontation, with policymakers as well, on which solutions to implement. A set of fourteen solutions were chosen to be presented to the Public Administration to evaluate if and how it was possible to implement those.	10	5	Definition of the ideas to be implemented

FIRST LOOP EVENT LOG						
				No. of participants		
Title & purpose of event	Workshop #	Date	Content	Citizens	Policymakers	Key Results
Evaluation of proposed solutions	Partners meeting	15th Nov 2018	Meeting between Università Iuav di Venezia, Comune di Verona and Legambiente to check the proposed solutions and to understand how those could be implemented. After checking the feasibility of the solutions, the Comune di Verona asked to the district councils of the area what their idea on the ideas proposed by participants was.	0	7	Definition of how ideas could be implemented in a real situation

Table 1 first loop event log

SECOND LOOP EVENT LOG						
				No. of participants		
Title & purpose of event	Workshop #	Date	Content	Citizens	Policymakers	Key Results
End of the first loop	Workshop #7	3rd Jul 2019	Meeting with participants to better analyse the results obtained during the first loop. This was followed by the analysis of the data collected during the 3b. Monitoring. Since participants decided to continue with the same issues from the first loop, the 3b. Monitoring form the first loop became 1b. Data collection from second loop. Due to this it was decided to do directly for the 2b. Co-design of the second loop during the following meeting.	15	3	Definition of the approach for the second loop
Co-design	Workshop #8	4th Dec 2019	Draft of the official list of request and desiderata that the Verona LLL proposes to the Comune di Verona. The proposed ideas and solutions are more of long-term ones that want to set a basis for the Verona LLL work to continue after the end of the LOOPER project.	11	2	Official document with the implementation proposed by the Verona LLL
Planning for future implementations	Partners meeting	19th Dec 2019	Presentation of the ideas to be implemented to the Aldermen of the Comune di Verona. The representatives of the Comune accepted the ideas of the Verona LLL and started to define with the LLL organisers how to present more officially the acceptance of these ideas within the agenda of the City Council.	0	8	Deeper analysis of the proposed ideas and evaluation of how to officially accept the proposed solutions
Future implementations	Press conference	3rd Jan 2020	Official acceptance of the first proposed idea and communication of furthermore press conferences about the other proposed ideas.	1	3	Official acceptance of the proposed ideas

Table 2 second loop event log

Workshops' learning

FIRST LOOP WORKSHOPS' LEARNING	
LEARNING TYPE	**Workshop 1**
information ('know-what'):	*Citizens learned about how pollutants work and diffuse*
Network ('know-who'):	*Citizens learned who to work with and who to ask advice*
skills / resources ('know-how'):	*Citizens learned the differences between different sensors and how to use them*
norms / goals ('know-why'):	*No*
LEARNING TYPE	**Workshop 2**
information ('know-what'):	*Citizens learned basic information on how pollutants work have been consolidated*
Network ('know-who'):	*Citizens learned who to work with and who to ask advice*
skills / resources ('know-how'):	*Citizens learned how sensors can be positioned and why they need to be positioned in a certain way*
norms / goals ('know-why'):	*No*
LEARNING TYPE	**Workshop 3**
information ('know-what'):	*No*
Network ('know-who'):	*Citizens learned how to better co-operate with other people to gain better results*
skills / resources ('know-how'):	*Citizens learned how to use low cost sensors by themselves*
norms / goals ('know-why'):	*Citizens learned that pollution in most cases is uniformly distributed on a larger area (done with their data collection) and better understood the norms*
LEARNING TYPE	**Workshop 4**
information ('know-what'):	*Citizens learned what co-design is and how it works*
Network ('know-who'):	*Citizens learned how to co-operate with other groups of stakeholders*
skills / resources ('know-how'):	*Citizens learned how to develop solutions which can be implemented*
norms / goals ('know-why'):	*Citizens learned about the boundaries within which policymakers and the public administration work*
LEARNING TYPE	**Workshop 5**
information ('know-what'):	*Citizens learned which co-design ideas have been produced around Europe*
Network ('know-who'):	*Citizens learned how to co-operate with other groups of stakeholders*
skills / resources ('know-how'):	*Citizens proposed ideas which could be better implemented thanks to the knowledge gained in the previous meeting*
norms / goals ('know-why'):	*Citizens better understood the norms that bind urban problems and solutions*
LEARNING TYPE	**Workshop 6**
information ('know-what'):	*Citizens learned what policymakers have in program to do about this topic*
Network ('know-who'):	*Citizens meet people working in the public administration who could help them*
skills / resources ('know-how'):	*Citizens learned what could be done or could not be done*
norms / goals ('know-why'):	*Citizens learned more specific norm that influence their proposed ideas*

Table 3 first loop workshops' learning

SECOND LOOP WORKSHOPS' LEARNING	
LEARNING TYPE	*Workshop 7*
information ('know-what'):	*Citizens learned how to address policymakers*
Network ('know-who'):	*Citizens better understood who to address*
skills / resources ('know-how'):	*Citizens learned how to draft a more official request*
norms / goals ('know-why'):	*Citizens learned why proposing longer term solutions*
LEARNING TYPE	*Workshop 8*
information ('know-what'):	*Citizens learned how to address policymakers*
Network ('know-who'):	*Citizens better understood who to address*
skills / resources ('know-how'):	*Citizens learned how to draft a more official request*
norms / goals ('know-why'):	*Citizens learned why proposing longer term solutions*

Table 4 second loop workshops' learning

Intervention log

The two following tables show in each column a intervention selected for implementation during the evaluation activity, and its characteristics are explained i.e. type of intervention, location, dimension, timeframe, reason for the intervention, cost and who needs to implement it.

The interventions chosen for implementation during the first loop were: street closure of a specific road to create a safe outdoor aggregation space; crosswalk island to lower vehicle speeds in proximity to a primary school and to allow a safer space for children; 30km/h zone to reduce noise levels and to have safer neighbourhood streets for residents; some other street closure in the whole area of Verona Sud to allow citizens in living their urban space.

The interventions later chosen during the second loop were longer-term ones, and where more oriented to allow deeper urban transformation. Such interventions were chosen again between the ones proposed during the first loop, but some were not implemented given the long-term implementation, and were: creation of a urban forest to create a urban green lung; wider spread crosswalk islands to make it safer for citizens to walk and to leave cars at home; green noise barriers to reduce air and noise pollution produced by the A4 highway that cuts in half the area of Verona Sud; street closure and creation of urban spaces, because in the area outdoor community spaces are missing.

FIRST LOOP INTERVENTIONS LOG				
INTERVENTIONS	**STREET CLOSURE OF SPECIFIC ROAD**	**CROSSWALK ISLAND**	**30 KM/H ZONE**	**STREET CLOSURE**
What is the intervention?	Street closure	Crosswalk island	30 km/h zone and street closure	Street closures
Where is it?	Via Ottavio Caccia	Via Colonnello Fasoli	Via Udine	South Verona area
How large an area does it cover?	One block	One street	One street	The whole area
What is the timing and duration of the experiment?	February to April	February to April	February to April	February to April
What problems does it respond to?	Air and noise pollution	Traffic issues	Air and noise pollution, traffic issues	Air and noise pollution, traffic issues

How/why was this intervention chosen?	Environmentally safer area and citizens will to have an aggregation area where children can go safely	Safer places for children	Environmentally safer area	Citizens will to have an aggregation area where children can go safely
How much funding is required?	Low cost	Already at budget. Medium cost	Low cost	Low cost
Partner name & role A	Comune di Verona needs to implement it with the support of citizens. Citizens proposed the idea	Comune di Verona needs to implement it. Comune di Verona and citizens proposed the idea	Comune di Verona needs to implement it with the support of citizens. Comune di Verona and citizens proposed the idea	Comune di Verona needs to implement it with the support of citizens. Citizens proposed the idea
Funded / in-kind contribution	None	None	None	None

Table 5 first loop interventions' log

Figure 1 Implementation of a crosswalk island in via Colonnello Fasoli

SECOND LOOP INTERVENTIONS LOG				
INTERVENTIONS	**URBAN FOREST**	**CROSSWALK ISLAND**	**GREEN NOISE BARRIERS**	**STREET CLOSURE AND CREATION OF O URBAN SPACES**
What is the intervention?	Creation of urban forests	Crosswalk islands	Green noise barriers	Street closures
Where is it?	Parco Santa Teresa	Via Colonnello Fasoli	Highway A4 Milano-Venezia	South Verona area

How large an area does it cover?	One block widening of the park	One street	Highway portion that cuts in half the area of Verona Sud	The whole area
What is the timing and duration of the experiment?	Design during 2020 and future implementation to be defined	February to April	Dialogue with Società Autostrade from 2020	February to April
What problems does it respond to?	Air pollution	Traffic issues	Air and noise pollution, traffic issues	Air and noise pollution, traffic issues
How/why was this intervention chosen?	Need of a green lung and of an aggregation area where children can go safely	Safer places for children	Environmentally safer area	Citizens will to have an aggregation area where children can go safely

Activities will be organised to boost participation |
How much funding is required?	High cost	Already at budget. Medium cost	High cost	Low cost
Partner name & role A	Comune di Verona needs to implement it with the support of citizens. Citizens proposed the idea	Comune di Verona needs to implement it. Comune di Verona and citizens proposed the idea	Comune di Verona needs to implement it with the support of citizens and Società Autostrade. Comune di Verona and citizens proposed the idea	Comune di Verona needs to implement it with the support of citizens. Citizens proposed the idea
Funded / in-kind contribution	Comune di Verona	None	Comune di Verona, Società Autostrade and other funding	Comune di Verona

Table 6 second loop interventions' log

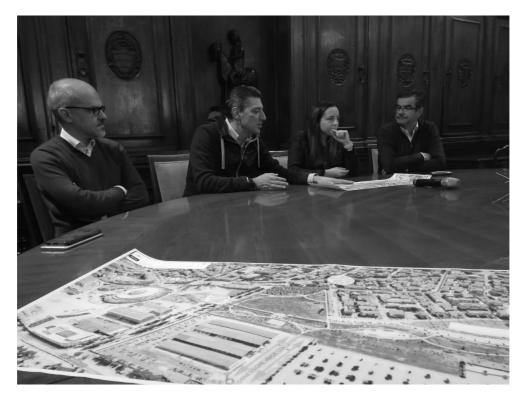*Figure 2 Design of the urban forest as presented by the Comune di Verona*

Figure 3 Press conference to present the urban forest future implementation

Impact assessment template

STREET CLOSURE IN SPECIFIC ROAD (FIRST LOOP)				
	FUNCTIONAL PROBLEMS / IMPACTS	**STRATEGIC CHALLENGES / EFFECTS**	**HOW TO MONITOR - METHODS**	**WHO MONITORS - ACTORS**
Air quality				
	Reductions in NOX & PM levels	Better air quality	*AirBeam and Air Monitor Official data from ARPAV*	*Citizens: with environmental agencies*
Noise				
	Reductions in noise levels and reductions in noise complaints	Improvement in liveability	*Noise boxes*	*Citizens*
Traffic & roads				
	Reductions in traffic	Improvements in perception of safety & liveability	*Qualitative data*	*Citizens*

Table 7 street closure impact assessment template

CROSSWALK ISLANDS (FIRST AND SECOND LOOP)				
	FUNCTIONAL PROBLEMS / IMPACTS	**STRATEGIC CHALLENGES / EFFECTS**	**HOW TO MONITOR - METHODS**	**WHO MONITORS - ACTORS**
Traffic & roads				
	Reductions in traffic accidents	Improvements in perception of safety & liveability	*Qualitative data*	*Citizens*

Table 8 crosswalk islands impact assessment template

30 KM/H ZONE (FIRST LOOP)				
	FUNCTIONAL PROBLEMS / IMPACTS	**STRATEGIC CHALLENGES / EFFECTS**	**HOW TO MONITOR - METHODS**	**WHO MONITORS - ACTORS**
Air quality				
	Reductions in NOX & PM levels	Better air quality	*AirBeam and Air Monitor Official data from ARPAV*	*Citizens: with environmental agencies*
Noise				
	Reductions in noise levels and reductions in noise complaints	Improvement in liveability	*Noise boxes*	*Citizens*
Traffic & roads				
	Reductions in traffic	Improvements in perception of safety & liveability	*Qualitative data*	*Citizens*

Table 9 30 km/h zone impact assessment template

STREET CLOSURE (FIRST AND SECOND LOOP)				
	FUNCTIONAL PROBLEMS / IMPACTS	**STRATEGIC CHALLENGES / EFFECTS**	**HOW TO MONITOR - METHODS**	**WHO MONITORS - ACTORS**
Air quality				
	Reductions in NOX & PM levels	Better air quality	*AirBeam and Air Monitor Official data from ARPAV*	*Citizens: with environmental agencies*
Noise				
	Reductions in noise levels and reductions in noise complaints	Improvement in liveability	*Noise boxes*	*Citizens*
Traffic & roads				
	Reductions in traffic	Improvements in perception of liveability	*Qualitative data*	*Citizens*

Table 10 street closure impact assessment template

URBAN FORESTS (SECOND LOOP)				
	FUNCTIONAL PROBLEMS / IMPACTS	**STRATEGIC CHALLENGES / EFFECTS**	**HOW TO MONITOR - METHODS**	**WHO MONITORS - ACTORS**
Air quality				
	Reductions in NOX & PM levels	Better air quality	*AirBeam and Air Monitor Official data from ARPAV*	*Citizens: with environmental agencies*
Noise				
	Reductions in noise levels and reduction in noise complaints	Improvement in liveability	*Noise boxes*	*Citizens*

Table 11 urban forest impact assessment template

GREEN NOISE BARRIERS (SECOND LOOP)				
	FUNCTIONAL PROBLEMS / IMPACTS	STRATEGIC CHALLENGES / EFFECTS	HOW TO MONITOR - METHODS	WHO MONITORS - ACTORS
Air quality				
	Reductions in NOX & PM levels	Better air quality	*AirBeam and Air Monitor Official data from ARPAV*	*Citizens: with environmental agencies*
Noise				
	Reductions in noise levels and reduction in noise complaints	Improvement in liveability	*Noise boxes*	*Citizens*

Table 12 green noise barriers impact assessment template

2.1.2. Learning around tackled issues

The questions hereafter asked are based on the information from the above tables of section 2.1 and are used to further evaluate and understand the process undertaken in the Verona Looper Living Lab.

How did the problem identification go? Does the problem "frame" fit the problem?

The problem identification of the first loop showed that the main criticalities found by participants were the ones expected by local project partners - i.e. Comune di Verona and Legambiente. Such criticalities were linked to the main framework of air quality and noise pollution, meaning that the initial problem "frame" actually fitted the problems. Participants of the Verona Looper Living Lab then, based on the results obtained at the end of the first loop, confirmed their willingness to continue in working on the same criticalities for the second loop.

How did the data gathering go? Is the data robust and complete?

The data collection and monitoring activity gave good results in term of data - both type and quantity - and participation form stakeholders. Not all low-cost sensors worked during the first loop - e.g. some components had factory defects - but the team from the Università Iuav di Venezia tried to solve such difficulties before the second loop. It was not possible to further improve all low-cost sensors to gather useful data during the second loop, but it was still possible to understand how to modify them to be able to collect useful data. Indeed, some extra low-cost sensors were later added and tested.

It is possible to say that, for the needs of the Looper Living Lab of Verona, the data collected for both loops can be considered robust and complete.

How did the data visualisation go? Is the analysis suitable and effective?

The data visualisation has been very successful for Verona. Local stakeholders were very keen in analysing data all together, and they trusted more official data showed on a 'neutral dashboard' - i.e. a visualisation dashboard that was neither owned nor updated by official bodies or the city council. The user-friendly interface developed for the Looper project has only few options inbetween which to choose - e.g. no multiple layer selection and only one monitoring campaign at time. Given its easy to use interface it was appreciated by participants and made the process easier for all stakeholders.

The benefits given by the data visualisation were found again during the second loop.

How did the problem analysis go? Does the specific problem fit with the "wider problem"?

Not all the problems and criticalities presented during the problem identification were then confirmed by the data collection and visualisation. One main difference was that local stakeholders thought that particulate matter air quality issues were very specific and localised, and they found out that this was a

misconception. The previous participatory sensing was - during the problem analysis – very important because it allowed a more open dialogue in between parties, because local stakeholders trusted their data and better understood how pollutants are distributed.

During the first loop, despite their understanding of pollutants distribution, participants still requested to work on small punctual solutions to create benefits 'to their neighbourhood', but later realised that this was not the right way to approach air quality issues. During the second loop, local stakeholders better understood the meaning of the previous problem analysis and started to think differently - with a wider community vision - about how to solve the found issues.

How did the co-design go? Are there ways of learning about both specific problems and wider problems, in order to make better decisions?

The co-design activity for the first loop was successful from a participation point of view since n° 38 ideas were proposed and discussed by participants, but results from its implementation were not what local participants expected. This was because local stakeholders wanted to focus on more specific locations and problems. For the second loop, given the null results from the first loop implementation, they decided to focus on wider scale problems and solutions.

How did the evaluation go? Are there ways of improving group decision-making?

During the first loop an adapted version of the Multi-Actor Multi-Criteria Analysis (MAMCA) was used to decide which proposed solutions to implement. For the second loop no evaluation was done, because the ideas chosen for implementation were long-term ones proposed but not chosen during the first loop.

For the Verona Looper Living Lab it was challenging to implement the MAMCA because the project area was a wide one, and proposed solutions were located in different parts of the area. This combination of different solutions in different locations does not suit the MAMCA (its main goal is comparing different solutions for the same location and with the same aim - i.e. different public transport methods to connect same places).

Nevertheless, by grouping similar solutions and considering their implementation as if it was in the same location, it was possible to confirm with an analytical analysis the preferences that stakeholders expressed during the co-design activity.

It would be interesting to understand how to better implement the MAMCA method to allow an easier evaluation of different ideas, in different locations, but with the same main aim.

How did the solution implementation go? Are there ways of learning how to plan better? Are there ways of learning (in the provider organization or supplier) on how to manage this better?

The implementation of ideas for the first loop went quite straight forward, since the proposed ideas were small punctual ones. It was possible to notice how some ideas - i.e. crosswalk islands – were of easy implementation because the Comune di Verona already had an agenda about this type of implementations.

Given the results obtained at the end of the first loop, participants better understood why longer-term solutions can create higher benefits for the community. Thus, they decided to implement the long-term ideas proposed during the first co-design.

Thanks to the knowledge acquired during the first loop, participants were able to better read collected data, and they were able to better plan and formalise the implementation of their ideas.

The implementation of long-term ideas, that raised from participants because they understood the benefits, will allow the continuation of the process even after the end of the project. This because the Comune di Verona accepted to endorse the proposed ideas, and all stakeholders will be able to keep an open table for dialogue throughout the implementation.

How did the monitoring and feedback go? Are there channels for feedback, to improve the process in the future?

The first loop monitoring activity showed no relevant effects on such a large area as Verona Sud. Based on these partial results, participants decided to keep working on criticalities found during the first loop, and they 'transformed' it in data to be used as it was the data collection form the second loop.

This further allowed to understand the importance of being flexible in the application of the process, because forcing the process might result in loosing participants - i.e. having a second scoping and data collection would result in a repetition of unnecessary activities from a participant point of view.

2.2. Online platform

The "online platform" section includes all tools and information that can be found on the local website of the Verona Looper Living Lab (https://verona.looperproject.eu) i.e. data visualisation dashboard, co-design tool, news and events section for dissemination.

2.2.1. Data analytics on the online platform

The following tables - based on the templates from D4.2 evaluation summary - show some data analytics on how the visualisation dashboard and co-design tool were used by participants.

The "Data visualisation dashboard" and "Co-design tool" tables show data about the online tools embedded in the online platform e.g. number of accesses, usability, triggered learning processes, etc.

Data visualisation dashboard

HAS BEEN THE PLATFORM USED BY ORGANISERS?	
Comments	*Organisers mostly used the platform as it helped to organise and keep a focus during the workshops done with stakeholders. The platform was also used within internal meetings to always have control of what was happening during the project* *This happened both during the first and second loop*
N° of data layers	*13 (first loop)* *15 (second loop)*
HAS BEEN THE DASHBOARD USED BY USERS?	
Comments (by organisers)	*Users used the dashboard both during the first and the second loop*
N° of accesses	*1607 (2018)* *714 (2019)* *23 (2020)*
Its usage during living labs sessions?	*The dashboard was mostly used during living lab session of the first loop*
USABILITY	
Comments by (organisers)	*Users asked the implementation of the scrollers (timeline) for a more detailed visualisation of the AirBeam data in different periods, they also found interesting the acoustic zoning layer once added*
User feedbacks	*They found the dashboard feasible and user-friendly for their needs*
DOES THE DASHBOARD TRIGGERED LEARNING PROCESSES?	
information ('know-what')	*Participants learned the importance of the participatory data collection as they could see how many data they could collect all together* *This happened both during the first and second loop*
networks ('know-who')	*No. The dashboard did not allow direct interaction in-between different stakeholders since it is a visualisation tool.* *This happened both during the first and second loop*
skills / resources ('know-how')	*Participants learned how to read collected data in a clearer way* *This happened both during the first and second loop*
norms / goals ('know-why')	*Based on the shown results, participants better understood why official sensor are not positioned too close to each other.* *This happened both during the first and second loop*

Table 13 data visualisation dashboard

Co-design tool

HAS BEEN THE CO-DESIGN TOOL USED BY USERS?	
Comments (by organisers)	*The co-design tool has been widely used both by people participating at the face to face meeting and from people who could not participate.* *This happened during the first loop. During the second loop the platform was not directly used to collect new ideas as participants decided to focus again on ideas proposed during the first loop*
N° of accesses	*317 (2018)* *145 (2019)* *6 (2020)*
N° of users posting ideas	*15 (first loop)* *0 (second loop)*
N° of posted ideas	*Posted ideas were both the ones added by organisers (as repository for the work done during face-to-face meetings) and the ones added by people who did not participate at meetings.* *38 (first loop)* *0 (second loop)*
Its usage during living labs sessions?	*The tool has been used to reflect on the ideas proposed during the meetings and helped to see if there where solutions which gained more support. It was helpful also to make a quick recap of the previous meetings.* *This happened during the first loop. It was not used during living labs sessions of the second loop*
USABILITY	
Comments by (organisers)	*Participants were positive about the usage of the online co-design tool as both proposing portal and storage of possible ideas*
User feedbacks	*They found the online co-design tool feasible and user-friendly for their needs. The only flaw was the bug that did not allow the upload of images with the idea*
DOES THE CO-DESIGN TOOL TRIGGERED LEARNING PROCESSES?	
information ('know-what')	*It helped participants better understand they ideas of other citizens* *This happened during the first loop. It was not used during the second loop*
networks ('know-who')	*In helped citizens understand which different citizens' organisations have similar ideas and purposes* *This happened during the first loop. It was not used during the second loop*
skills / resources ('know-how')	*They learned how to use an online co-design tool* *This happened during the first loop. It was not used during the second loop*
norms / goals ('know-why')	*No*

Table 14 co-design tool

2.2.2. Learning about the online platform

On the basis of the above tables it was possible to obtain some extra information to answer the following questions that allows a wider evaluation of the online platform.

Did the technical platform work as intended?

For the Verona Looper Living Lab the technical platform worked as intended.

Were there problems or gaps?

One minor technical issue was encountered with the co-design tool. A bug of the tool did not allow the automatic upload of photos while adding an idea. Since the developers of the tool were not able to solve the bug, participants needed to send the photos to organisers to upload them via the admin page.

Did it produce negative side-effects?

No side-effects were produced from the online platform.

Did it produce positive spin-offs?

Some positive spin-offs were produced from the online platform. Concerning the data visualisation dashboard, it reduced conflicts between local stakeholders and policymakers. Talking about the co-design tool, it helped in creating positive debates about the proposed ideas.

Was there an effective offline/social platform?

In Verona there was an effective offline/social platform that also interacted with the online platform.

What are the implications for others setting up similar platforms?

The suggestion is to carefully evaluate the possible tools to be added on the online platform based on the socio-cultural context. Furthermore, it is important to keep in mind that the platform has to be as simple and user-friendly as possible.

2.3. Community learning

The learning loop taking place during the process can be divided in community and policy loop, and each can further differentiate between a functional and a strategic loop. The following table - based on the templates from D4.2 evaluation summary - summarises the functional and strategic learning that took place at community level.

On the basis of the following table it was then possible to gather information to answer the questions about the functional and strategic loops in sections 2.3.1 and 2.3.2.

LEARNING TYPE	TYPICAL QUESTIONS to be addressed	FUNCTIONAL PROBLEMS / IMPACTS	STRATEGIC CHALLENGES / EFFECTS	LEARNING EVALUATION METHODS
information ('know-what'):	*did the residents learn generally about access to technical data and analytical techniques?*	*Participants learned how to undertake air/noise monitoring*	*Participants gained base knowledge on pollutants*	*Discussion with participants*
networks ('know-who'):	*did they learn generally who to call or ask advice, or to lobby for similar problems?*	*Participants gathered knowledge on contacts & sources for air/noise/ greenspace issues*	*Participants gathered knowledge about actors in the policy system*	*Discussion with participants*
skills and resources ('know-how'):	*did they learn ways of managing information, presenting the results, managing professionals, project management?*	*Participants learned air/noise monitoring techniques*	*Participants learned general skills for information, lobbying, negotiation, project management*	*Discussion with participants*
norms / goals ('know-why'):	*did they learn about the wider goals of community capacity and empowerment?*	*Participants gained knowledge about capacity building for urban environment goals and targets.*	*Participants learned about their capacity as community and understood that they can eb empowered by such process*	*Discussion with participants*
GENERAL ISSUES	*Are the results in line with what we expected? Any ideas for improvement? Etc…*	*The results are in line with what was expected by organisers. Citizens and policymakers started to have a more open and constructive dialogue. Citizens better understood how pollutants work and which are the issues when trying to solve urban issues linked to air and noise pollution.* *Community learning could be improved by having even more lectures on the different topics investigated by the project.* *This was further confirmed with the second loop*		

Table 15 community learning

2.3.1. Functional loop

Information (know-what)

Local stakeholders generally learned about how to access to technical data, and analytical techniques, about air quality and noise pollution monitoring. This is a long-term positive result of the process, because they now feel more confident about official data as well.

Networks (know-who)

Local stakeholders learned about who to contact and where to find sources to tackle issues linked to air quality, noise pollution and greenspaces. This helped in reducing conflicts between the parties.

Skills and resources (know-how)

Local stakeholders learned the correct ways to manage information about air quality and noise pollution, and the correct monitoring techniques. This can allow better monitoring on a long-term basis because citizens are willing to build their own low-cost sensors to monitor the urban environment.

Norms/goals (know-why)

Local stakeholders better understood which goals are to be reached, and which targets there are to consider, to implement feasible urban transformations.

2.3.2. Strategic loop

Information (know-what)

Local stakeholders learned practicalities about environmental science, and how to access and understand data about it.

Networks (know-who)

Local stakeholders gathered knowledge about the actors within the policy system. Citizens better understood the importance of networking with different stakeholders, and not only in-between themselves.

Skills and resources (know-how)

Local stakeholders acquired skills on how to collect information, who to lobby with, how to negotiate, and how urban transformation projects are managed.

Norms/goals (know-why)

Local stakeholders started some interesting dialogues about wider issues of inequality and about active democracy.

2.4. Policy learning

The following table - based on the templates from D4.2 evaluation summary - summarises the functional and strategic learning that took place at policy level.

On the basis of the following table it was then possible to gather information to answer the questions about the functional and strategic loops in sections 2.4.1 and 2.4.2.

LEARNING TYPE	TYPICAL QUESTIONS to be addressed	FUNCTIONAL PROBLEMS / IMPACTS	STRATEGIC CHALLENGES / EFFECTS	LEARNING EVALUATION METHODS
information ('know-what'):	did the policymakers learn generally about improving access to technical data and analytical techniques?	Technical data access Data analysis techniques	Make data more open and user-friendly	Group discussion
networks ('know-who'):	did they learn generally who to involve in the community or other stakeholders in the local environment?	Contacts & sources between citizens and policymakers	Community involvement	Group discussion
skills and resources ('know-how'):	ways of managing participation, building it into policy development and co-design of interventions?	How to co-design with citizens	Creating a more stable open dialogue with citizens	Group discussion
norms / goals ('know-why'):	did they learn about the general goals of community capacity and local empowerment?	Citizens needs to urban and environmental related issues	Active democracy	Group discussion
GENERAL ISSUES	Are the results in line with what we expected? Any ideas for improvement? Etc...	The results are in line with what was expected by organisers. Citizens and policymakers started to have a more open and constructive dialogue. Policymakers better understood what citizens are willing to have in terms of a more liveable urban space. Policy learning could be improved by having even more representatives of the public administration at the meetings This is further confirmed with the second loop. Aldermen were more involved in the process and other longer-term ideas were accepted. After the first loop policymakers understood the benefits of listening to the ideas proposed by citizens that worked within an organised co-creation process such as the LOOPER one.		

Table 16 policy learning

2.4.1. Functional loop

Information (know-what)

Policymakers gathered some extra knowledge about local problems of air quality from local stakeholders, this allows them to know the neighbourhood better.

Networks (know-who)

Policymakers now have a clearer idea of who are the contact people for each stakeholders' group. This helps in creating more stable connections with citizens, to make them feel part of the process.

Skills and resources (know-how)

Policymakers learned which tools and sensors can be used to activate participatory sensing, and they better understood how to approach citizens when talking about co-design. They learned that there is the need to share their knowledge with citizens to gather good results.

Norms/goals (know-why)

Policymakers already had knowledge about norms and goals to address the tackled topics.

2.4.2. Strategic loop

Information (know-what)

Policymakers better understood how to make qualitative and quantitative data open and user-friendly. By doing so they also understood how to explain data to citizens to avoid conflicts.

Networks (know-who)

Policymakers learned the importance of using the data they have to make a proper socio-cultural analysis in order to involve all possible stakeholders based on the topic of the process. They also realised the big difference that can make a neutral organiser.

Skills and resources (know-how)

Policymakers understood that knowledge sharing is the key point of the process, because the technical knowledge they have can give better result if they gather direct data about the neighbourhood - and vice versa for local stakeholders. Moreover, if they share their expertise, and explain why certain ideas cannot be implemented, there are higher chances of creating an open dialogue with citizens.

Norms/goals (know-why)

Policymakers learned that when local communities feel empowered, they are more willing to help in changing their behaviours. This then further helps to gather consent when implementing urban transformations and allows better results.

2.5.Process evaluation

2.5.1.Whole lab evaluation

The following table - based on the templates from D4.2 evaluation summary - allows a whole lab evaluation based on the "6-P" main components for each Living Lab (see deliverable D8.1 for further explanation on the "6-P" components).

	FORMATIVE EVALUATION (processes & methods)	SUMMATIVE EVALUATION (outcomes & results)
PEOPLE	is there evidence of social learning: in and around the community: or in and around the policy system?	*How can the overall results contribute to community learning and development?* *were the people as a whole engaged and mobilized: could this be done better?* How did we involve (or not) hard-to-reach groups?
	For the Verona Looper Living Lab it is possible to say that there was evidence of social learning both at community and policy level, but also in between community and policymakers. Stakeholders at community level better learned to listen to other citizens' point of view, and to listen to policymakers before judging them. Policymakers better learned to take into account citizens point of view, and to explain the reasons behind their decisions.	The overall result of the Verona Living Lab contributed to the community learning and development. This was possible because, thanks to the double loop process, citizens better understood why certain solutions cannot solve air quality related issues. People were engaged and mobilised because the tackled issue was a hot topic for the project area. There is still room for improvement since some resources were lost in trying to involve everyone. A better initial socio-cultural analysis would have avoided the presence of hard-to-reach groups, because the dissemination about the project would have been more targeted. Not all hard-to-reach groups were involved despite the use of many different methods of dissemination. This can be explained by analysing that the addressed target group was any person gravitating on the area of Verona Sud, but some of them were actually not interested on the topic. If a better analysis on target groups was done in the beginning, there would be a reduction of hard-to-reach groups.
PRIORITIES	which of the initial priorities / goals were worked on, fulfilled or achieved? Is there evidence of learning on the nature of the priorities as a whole, and possible responses?	*How can citizen monitoring combine with deliberation, to identify and understand **problems** in the urban environment?* *How can citizen monitoring combine with deliberation, to assist in **co-design for solutions** in the urban environment?*
	The initial goals of reducing air and noise pollution is not yet achieved given the small punctual solutions implemented during the first loop. Nevertheless, an important long-term work to reduce pollutants levels already started with the second loop.	Citizen monitoring allows to have more qualitative and qualitative data on specific issue, this then allows to have a better knowledge on the initial situation and the actual problems/criticalities that there can be. The collected data, combined with the deeper local knowledge on the project area, can result in the co-design of better solutions to transform the urban environment.
PLACE	did the place as a whole benefit from the Lab: was there social learning on the place's problems / opportunities?	what are the implications for place-based Labs, and area-based policies in general?
	The place could benefit from the Lab since it was possible to better understand how to face possible issues and criticalities.	Place-based Labs and area-based policies are highly relevant because every location differs for some aspect - e.g. morphology, social and cultural aspects, etc - and it is not possible to use fixed/standard solution.

	FORMATIVE EVALUATION (processes & methods)	SUMMATIVE EVALUATION (outcomes & results)
PLATFORM	did the technical platform work as intended: were there problems or gaps: did it produce negative side-effects or positive spin-offs? Was there an effective offline / social platform?	How can citizen monitoring and co-design enhance the use of MCA and MAMCA? How can MCA and MAMCA enhance citizen monitoring and co-design? How does data visualization and analysis enhance citizen co-design?
	The technical platform for the Verona Living Lab worked as intended and allowed to reach a wider audience. No negative side-effects were produced. The platform produced some positive moments of confrontation because people who could not participate were able to share their point of view. Furthermore, if they knew people who participate, they could also share and confront their ideas outside face-to-face meetings.	In Verona MAMCA was adapted to confirm the goodness of chosen solutions. Data visualisation and analysis can enhance co-design by allowing a better understanding of the issue, and thus how to use resources and design to solve it.
POLICIES		How can policy learning enhance citizen co-design? How can policy benefit from citizen monitoring design? How can quantitative data link with qualitative evidence, to enhance co-design and implementation?
		Policy learning can enhance citizen co-design by explaining more clearly the boundaries that are to be faced - in term of law and bureaucracy - when implementing a solution to trigger urban transformations. Policy can benefit from citizens monitoring because participatory sensing with low-cost sensors – to collect both qualitative and quantitative data - can give a better representation of the real situation of the urban environment. The use of quantitative data to prove qualitative ones is mandatory, this because by doing so the co-design would then produce more objective solutions that are based on solid data and not on empirical ones.
PROCESS	How did the setting up process work? could it be improved?	evaluation process: how far it worked or not: how it could be improved: significance for other similar projects.
	The setting up of the whole process could be improved by better analysing the possible target groups in the beginning, and by paying - as done in Verona - more attention on what citizens are interested in as criticalities.	The process in Verona hit all the targets, and the implementation for the second loop will proceed even after the end of the project itself. Participants were so interested in the data collection that they started to build low-cost sensors on their own. Similar projects should learn from Looper how to adapt to different contexts, and how to develop/build/use low-cost sensors depending on the data they need to collect.

Table 17 whole lab evaluation

2.5.2. Evaluating the wider community and policy learning

The following questions allow to have a better understanding on the results of the learning that took place at different levels in the Verona Looper Living Lab.

Did the capacity building process work? Was it open and inclusive for all social groups?

The capacity building process did work in Verona, and it was possible because employee from the Comune di Verona participated to every workshop. The process itself was inclusive - based on the social groups that were effectively interested in the topic.

Did the co-design process work effectively? Were all viable options on the table? Was there a robust process of decision making?

The first co-design activity achieved good results in terms of participation and number of proposed solutions, but it did not produce stakeholders' expected results during the implementation. Nevertheless, it helped in better understanding urban transformations to solve air quality issues. All range of different ideas were proposed, and there was an important shift in the ideas chosen for the second loop. This allows to say that the co-design process as whole was successful.

The decision-making process was supported by the technical knowledge given by experts, law knowledge given by employee from the Comune di Verona, and deep knowledge on the area given by local stakeholders.

What is the evidence of community empowerment? Can it be assessed in activities, relations, communications, positive actions?

The community was empowered by the knowledge they acquired throughout the process. This can be assessed given their requests that are now more feasible and useful for the whole community. They are now also able to autonomously choose low-cost sensors to collect data about air quality and noise pollution and, moreover, they know how to use collected data depending on the reliability of the sensor.

Do the policy and service providers have the resources to address the problem? Or can they learn how to gather and mobilize the resources?

In Verona the tackled issue was air quality, this means that there is the need for long-term solutions with proportionate budgets. Policymakers already know how to find resources.

Is policy development and innovation working effectively? Is it (as far as possible) open, transparent, inclusive, entrepreneurial and creative?

During the two loop process the policy development was open and inclusive thanks to the presence of employee from the Comune di Verona to each meeting.

2.6.Reflect on this evaluation process

How did you experience this evaluation process?

This evaluation process helped in summarising the key points that took place in the Looper Living Lab.

Moreover, this evaluation document - thanks to the structure with tables and short questions - forces the research team in undertaking an impartial evaluation and auto-evaluation of the work done, that would be otherwise difficult to do.

Was the evaluation process effective and useful?

The evaluation process proved to be effective and useful.

The presence of logbooks allows to keep track of what happened during the whole process, and to document the evolving of the Living Labs step-by-step. This "story" can be helpful for others who want to apply the same process to another context.

What are its shortcomings and strengths?

The strength of this evaluation process lays in its precise and defined schema. The presence of tables and of short questions facilitate the comparison and cross evaluation between different Looper Living Labs.

Furthermore, this type of structure allows a better overview when preparing summary reports on the whole project (e.g. D8.1 Learning loop synthesis report and guidelines for the future application of the LOOPER methodology in living labs).

How could it be improved for other projects?

Questions might need to be rephrased to allow a clearer understanding for people who did not work within this project.

Better performance indicators should be defined. The ones used for Looper - e.g. number of meeting and number of participants - are useful and necessary, but might not be enough to make a complete evaluation of every aspect of the process.

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