



LEARNING LOOPS IN THE PUBLIC REALM

WP6. Learning Living Lab - Verona

T6.1. Inception of living lab and scoping of problems

Deliverable D 6.1

VERONA LIVING LAB IMPLEMENTATION PLAN INCLUDING DATA COLLECTION PLAN AND TEMPLATE FOR MONITORING

Version: 1.0

Date: 05 October 2018

Responsible partner: Legambiente

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DOCUMENT CHANGE RECORD

Version	Date	Status	Author	Description
0.1	7Feb2018	Draft	MC, CS	First internal draft
0.2	22Feb2018	Draft	MC, CS	Internal draft
0.3	19Apr2018	Draft	MC, CS, EM, CM	Internal draft
0.4	22Jun2018	Draft	MC, CS	Internal draft with new proposed structure
0.5	26Jun2018	Draft	MC, CS	Internal draft
1.0	05Oct2018	Final	MC, CS	Final document

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INTRODUCTION

Verona worked as a tester, and as guideline, for the other LOOPER Living Labs (LLL) and for the goal of the project itself. This was because of the issues and the pollutants that have been chosen to be monitored by the Verona LLL.

Because of this this document, deliverable D6.1, already considers some activities that have been already experimentally done and proposed in the previous months.

Objectives of WP6

The objective of WP6 is to establish an urban living lab in Verona to trial the LOOPER learning loop methodology, focusing on air-quality and noise in the Verona-South neighbourhood and potential mitigation measures through urban regeneration and design measures. The main aims are:

- to define and monitor with participatory technology (air quality measurements using portable sensors as well as official measurements, noise measurements, text and images) the problems linked to liveability;
- co-design and evaluate short and medium-term options for interventions through urban regeneration and design with implementation of a selected small-scale solution;
- monitor the results with participatory technology; evaluate the results and feedback to learning loops.

Specific objectives of D6.1

The Deliverable 6.1 is a report on the activities of the first task of WP6: “T6.1 - Inception of living lab and scoping of problems”. In this task, the context of the living lab will be defined by consulting local stakeholders. Stakeholders and their objectives will be identified and will be recruited for participation through local communication channels. The first deliberation will take place offline (meeting) and online (by setting up the local co-creation platform on the LOOPER website) to discuss and narrow down the problems. Special attention will be paid to the regulatory and institutional framework for urban planning.

Structure of this document

The objective of this document is to give all LOOPER project partners a hint about the current situation of the Verona ULL. This document can be used to double check the quality of what have been done until now, and to check if the process is working towards the same results in the other two ULLs (Brussels and Manchester).

To make the document as clear as possible it has been divided into four chapters, each of which deals with a specific phase of the process. Please consider that each topic deals with a specific phase, but all the phases are linked one to the other.

The first chapter of this document concerns the **DEFINITION OF PLACE**.

This first section will give a description about the current situation of the area of Verona south to better understand the context in which the LOOPER project will work. The description will consider both the social aspects (citizens, associations and every other stakeholder) and the urban conformation of the area (which includes both an industrial zone – with the Fairy – and two residential areas on the sides of the industrial zone.

The second chapter analyses the **DEFINITION OF PEOPLE**.

The definition of people section will explain how the project partners (Iuav and Comune di Verona) worked together with the co-operation partner (Legambiente) to involve possible stakeholders to participate to the LOOPER project.

Part of the chapter will be on the possible tools and ways to engage stakeholders to participate to the presentation of the project and then to give their adhesion to the project.

The third chapter shows the **DEFINITION OF PRIORITIES**.

The first phase of the problem scoping starts from the definition of the priorities (inception). This is because during the inception there is a first phase of approach with citizens to better understand which are the most problematic issues (i.e. air quality, noise pollution, greenspaces, etc.). In this way, it is possible to work with targeted interventions, which are more reconcilable with the idea and timing of the LOOPER project.

The fourth chapter is meant to give a hint about the **DATA COLLECTION PLAN**.

Here a summary of the data that it is needed to collect is made. This chapter is based on the co-monitoring stage that the Verona LLL already concluded, but also on what can be found in deliverable D2.1.

The fifth chapter wants to **DEFINE PLATFORMS**.

The part on the definition of platforms wants to explain which tools have been and will be used by the Verona LLL based on the needs and the capabilities of participants.

This chapters refers to the deliverables D2.1 and D3.1.

The sixth chapter shows the **MONITORING TEMPLATE**.

This plan helps to better understand which areas will be monitored, which pollutants will be controlled, with which instruments, during which period and for how long. The monitoring plan begins from the problem scoping phase carried out by ULL participants in the first few meetings.

The seventh chapter explains the **IMPLEMENTATION PLAN**.

A topic that will be discussed in this chapter is the strategy to structure the ULL, and sub sequentially the possible preliminary actions to apply to obtain positive results during the learning loop process.

1. DEFINITION OF PLACE

1.1. Description of the geographical location of the living lab

1.1.1. Location

The living lab is an area located in the south of Verona, which is a part of the city that has an active group of citizens willing to solve urban issues related to air quality and noise pollution. Its borders are delimited in the north by the train station of Porta Nuova and the Adige river, on the West side by the railway line of Verona, on the south by the motorway A4 Milano Venezia and on the east side by A regional street Via Palazzina that starts on Borgo Roma on the north and goes under the motorway on the south.



Figure 1 City of Verona. The living lab area is bordered with a yellow line.

Verona Sud is the south area of Verona, a city located to the north east of Italy. It is divided from the historical city by the railway park and the Adige river that configure it as a distinguished urban area.

Circumscription	Description	number of dwellings
3 - Ovest	Empty housing and housing occupied only by non-residents for the west Circumscription	1401
	Occupied Housing	25399
	Other type of occupied housing	108
5 - Sud	Empty housing and housing occupied only by non-residents for the south Circumscription	1233
	Occupied Housing	15324

	Other type of occupied housing	45
4 Sud-Ovest	Empty housing and housing occupied only by non-residents for the South-west Circumscription	910
	Occupied Housing	11305
	Other type of occupied housing	32

Table 1: South Verona number of dwellings



Figure 2 Living Lab area

1.1.2. Descriptive Characteristics

Institutions in the area

- Fiera di Verona Fair
- Hospital Borgo Roma ULSS 9
- University of Verona (Medicine and Surgery, Informatics, Biotechnology)
- Schools of different degrees (from nursery to high school)

Morphological details of the neighborhood

Verona Sud is a large urbanization of approximately 1,300 hectares crossed by a linear road axis (Viale Piave on the north and Viale del Lavoro on the south) that connects the center of the ancient city (Piazza Bra) with the motorway Milano Venezia.

The area is physically separated from the historic Verona by a bundle of road and rail infrastructure 100m wide.

In the north, departing from an area commonly known as “ex Magazzini Generali”, viale Piave has two opposite branch lines that form the main axes of the two districts of Borgo Roma and Of Golosine-Santa Lucia (see **Error! Reference source not found.**).

The central part, between the two neighbors is characterized by spaces and settlements destined for predominantly public functions.

Many areas are in use while others are abandoned or near disposal. In the following figure the different land uses are depicted.



Figure 3 Land use

Historical insights

The south area of Verona started to develop at the end of the XIX century.

In the early twentieth century, the first meridional neighbor was formed. From the 1924 and 1296 the plans for expansion were drawn up for Borgo Roma and Golosine.

From the 1924 to 1940 in the first part of Viale del Lavoro street, Magazzini Generali was built; it is the general Warehouse used for Collection retention sorting of fruit vegetables and cereals.

In the first half of the century the fair was established (1948). It was built in the north part of Verona Sud in an area of 300000 square meters on the side of Viale del Lavoro opposite to the Magazzini Generali warehouses. In that period, the industry grew up and in the 1949 the Z.A.I. (Industrial Agricultural Zone) was established. The industrial area was circumscribed in a large triangular area between Borgo Roma and Santa Lucia and as it expanded towards the south. Consequently, also Viale del Lavoro has been prolonged to the south.

In the 1958 the Fruit and vegetable market was moved alongside the Magazzini Generali warehouses.

From 1950 to 1970 the two residential neighbors Borgo Roma e Golosine-Santa Lucia rapidly grew up.

1.2. Description of Statistical Sources

The living lab area is constituted by several Circumscription, Neighborhood and Homogeneous Territorial Areas (ZTO). All the statistical data, when available, are referred to the following ZTO otherwise they are referred to the entire municipal territory.

Circumscription	Neighborhoods	ZTO
3 Quartiere Ovest	16 Borgo Milano	36 Porta Nuova
4 Quartiere Sud-Ovest	15 Santa Lucia	33 Santa Lucia Centro 77 ZAI di Santa Lucia
	17 Golosine	31 Golosine Nord 32 Golosine Sud
5 Quartiere Sud	14 Borgo Roma	24 Polidore 25 Tombetta 26 Primo Maggio 27 Tomba 28 ZAI di Borgo Roma



Table 2: Names of the neighbourhoods within the area of South Verona

1.3. More information

1.3.1. Statistics

Inhabitants

The Number of Inhabitants in the entire municipal area of Verona as of December 31, 2016: 257.353. The number of the inhabitants in the living lab area is ≈ 49.846 .

Population density in the entire municipal area of Verona: $257.353 / 198,958 \approx 1.293,504$ inhabitants/km²; in the living lab area, the population density is 3265.022 inhabitants/km².

Age Structure

In the last decade (2007-2016) in the entire municipal area, the average annual growth of the population was negative (-0.10%) while the average household size remained stable around 2.1 family members.

Resident foreign nationals are 35,245 (16,711 males and 18,534 females), in a decrease compared to 2015, by -3.5%.

Population Age Structure in the living lab area is summarized in the following table

Age	0-4	5-10	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	> 90
M	1170	1140	1106	1122	1267	1403	1510	1679	1952	2017	1861	1649	1277	1210	1213	1075	741	397	171
F	1023	1061	1093	1098	1240	1426	1478	1647	1820	1989	1981	1650	1427	1473	1446	1484	1142	870	508

Total	2193	2201	2199	2220	2507	2829	2988	3326	3802	4006	3842	3299	2704	2683	2659	2559	1883	1267	679
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Table 3: South Verona population age structure

Households

Resident households at 31 December 2016 are 254,086 (120,516 males and 133,570 females). Family households are 122,000. Residents living in homes (houses of Rest, nursing homes, barracks, convents, etc.) are 3,267 (1,219 males and 2,048 females). Total cohabitation is 179.

The following table shows the number of the component per family referred to the living lab area.

Number of component per family					
1	2	3	4	5	>5
8469	6086	3733	2622	769	303

Table 4: South Verona number of components per family

Multiculturalism ad Diversity

Nationalities/Ethnicities: as of December 31, 2016, the number of foreign inhabitants in the city is 35.245, equal to 13,7% of the total.

In the following table, the different ethnic groups and their development over the past decade are depicted. (The data are referred to the entire municipal area).

	Europe	% change over the previous decade	Africa	% change over the previous decade	America	% change over the previous decade	Asia	% change over the previous decade	Oceania	% change over the previous decade	stateless Persons	% change over the previous decade	Total
M	6993		3211		769		5730		7		1		16711
F	9731		2776		1160		4857		9		1		18534
Total	16724	76.0%	5987	-11.5%	1929	-22.6%	10587	50.6%	16	23.1%	2	-50.0%	35245

Table 5: South Verona ethnic groups

Socio-Economics

The following table shows the employment and unemployment rate of the entire province in comparison with the regional and the national data.

Age	Employment rate							Unemployment rate			
	15-24	25-34	35-44	45-54	> 55	15-64	Tot	15-24	25-34	> 35	tot
Verona (province)	19,6	72,3	82,6	83,0	45,7	67,5	50,4	23,5	9,0	4,1	6,2
Regione	20,8	72,5	80,9	79,3	46,8	63,7	48,9	24,7	9,9	5,0	7,1
Italia	15,6	59,7	72,1	70,6	48,2	55,7	43,1	40,3	17,8	8,0	11,9

Table 6: South Verona employment and unemployment rates

Housing

The number of housing in the living lab area referred to the three circumscription 3,4,5 (west, South – west South) are reported in the following table.

Circumscription	Description	number of dwelling
3 - Ovest	Empty housing and housing occupied only by non-residents for the west Circumscription	1401
	Occupied Housing	25399
	Other type of occupied housing	108
5 - Sud	Empty housing and housing occupied only by non-residents for the south Circumscription	1233
	Occupied Housing	15324
	Other type of occupied housing	45
4 Sud-Ovest	Empty housing and housing occupied only by non-residents for the South-west Circumscription	910
	Occupied Housing	11305
	Other type of occupied housing	32

Table 7: South Verona number of housing

1.3.2. Additional Analysis

General

By 2016 in the municipal area there are roads and pedestrian areas for a surface of 41,552 square meters. Public green areas in the municipal area are indicated at the following link: [Public green spaces 2016](#)

Public Transit

The area is served by urban buses of ATV. The lines of the bus lines are available at the link [Bus lines](#)

Safety

The number of street light points on municipal territory as at 31/12/2011 is 37,072

Street Traffic

Car park with about 2160 car seats within the area of the Ex-Market Fruit and Vegetable Market managed by VeronaFiere [[link: http://portale.comune.verona.it/nqcontent.cfm?a_id=3174](http://portale.comune.verona.it/nqcontent.cfm?a_id=3174)]

Parking lots in some city streets after payment of the hourly rate by tickets issued by parking meter

The following table shows the length of the cycling routes in the circumscription of the living lab.

Circumscription	3 West	4 South West	5 South	Total
-----------------	--------	--------------	---------	-------

Cycle paths	5.24 km	0.17 km	1.67 km	7.08 km
Cycle paths adjacent to the sidewalk	3.75 km	2.94 km	5.19 km	11.88 km
Cyclopedonal paths	7.36 km	7.27 km	7.12 km	21.75 km
Preferential bicycle lane	-	0.37 km	0.09 km	0.46 km
Total	16.35 km	10.75 km	14.07 km	41.17 km

Table 8: South Verona length of cycling routes

Walkability

The living lab area is peripheral and there are no exceptionally pedestrian areas. There are sidewalks along the streets.

2. DEFINITION OF PEOPLE (STAKEHOLDERS)

2.1. Identification of stakeholders

In the writing of the proposal a set of stakeholders have been contacted and they have been added to the list of partners of the project under the “implementation partner” caption. These neighbourhood associations have been called as they are active about Verona’s issues and they accepted to collaborate to the project. These partners are the:

- Beghelli;
- Comitato VR sud.

After the beginning of the project some other possible stakeholders have been contacted by the partners:

- Health department;
- Schools;
- Professionals associations (architects, engineers, acoustic technicians, etc.);
- Local authorities (including Environment office, Streets and Gardens office and Transport and Mobility office);
- general confederation of Italian commerce and tourism;
- Parents associations;
- Citizens;
- Other neighborhood associations.

2.2. Identification of hard-to-reach groups

From deliverable D3.2:

“[...]

The Verona Living Lab has attracted a diverse group of participants. The participants have different ages, genders, family statuses and health. However, many participants are Caucasian Italians, live in the neighbourhood, already were engaged with the topic of air quality, have a medium to high level of education, and own a car.

Groups identified as missing in the Verona Living Lab are people with non-Italian nationalities, representative of religious institutions in the neighbourhood, and those on low incomes. Reasons behind their lack of participation are believed to be low interest, lack of information, and difficulties in understanding the goal of the project.

[...]”

With the survey that was made for the deliverable D3.2 it was possible to see that there is a gap in between what citizens want and their ability of activating small actions to start to solve air quality related problems (i.e. using one car for each person).

For what it concerns the difficulties they had to understand the goal of the project, it was mostly due to their preconceptions on what have to be done to solve bad air quality in the city.

2.3. Engagement strategy for the stakeholder

2.3.1. Planning for stakeholders’ involvement

Before the official start of the Verona LOOPER Living Lab the Italian project partners meet to discuss about the situation of the area and to make a list of all possible stakeholders to be contacted and how to contact them.

After two meetings (one in July and one in October), it was decided that a first presentation meeting of the project, open to the whole city, with the alderman was needed to gain interest before the start of the Verona LLL. To prepare this meeting it was decided to directly contact all the citizens committee and associations, and in addition a press conference was called by the Comune di Verona to reach the majority of the population (which is not always involved in citizens committee or associations).

The partners Comune di Verona and Legambiente were in charge of contacting all the associations, such as: citizens committee; citizens associations; merchants of the area affected by the project; Chamber of Commerce; professional associations (engineer, architects, etc.); professional firms; parishes; single citizens who live and/or work in the area; schools; parent's associations; health department; etc.

2.3.2. First approach with implementation partners

The first approach with the implementation partners took place the 19th of July and both the Beghelli and the Verona Sud associations participated.

During this meeting it was possible to better explain to the associations how would the LOOPER project work and what each stage would be completed. It was also possible to start to understand which are the possible issues that can be found in the area.

Figure 4 here shows an example of the offline work we would later do during the Verona LOOPER Living Lab meeting, which was supposed to be a scoping using post-its to be attached on a printed satellite photo of the area to help citizens have a more complete view of what are the criticalities from their point of view.



Figure 4 Example of scoping of problems with citizens

2.3.3. How to engage stakeholders

The engagement of stakeholders was carried forward using different types of communication channels, as it is known that it would be difficult to reach everyone. That included:

1. press conference to introduce the LOOPER project organized by the Comune di Verona, which turned out into articles and interviews on local newspapers;
2. posters distributed in the commercial shops in the interested neighbourhoods, in the circumscription, in public areas and parishes of the area;
3. distribution of leaflets;
4. Legambiente and Comune di Verona mailing lists;
5. word of mouth.

What has been seen later is that articles on local newspapers, the distribution of leaflets and the word of mouth are the most successful types of communication to bring citizens to participate at the LOOPER Living Lab meetings. This might be linked to the preference stakeholders have for offline tools which we saw during the scoping of issues.

3. DEFINITION OF PRIORITIES

3.1. Summary of the general priorities

The area of South Verona has been chosen due to the presence of multiple problems related to air quality and noise pollution, which will be the main topic for this living lab.

These main issues are generated by various factors such as:

- Presence of the ZAI (agricultural and industrial area) which brings heavy traffic in the neighbourhood and produces pollution with factories;
- Presence of the building for exhibitions that occasionally creates traffic jams;
- Old heating plants which produce high levels of pollution;
- Confluence from two highways and the ring road;
- Particular climatic area because Verona is in the inland of the Po Valley;
- Etc.

Due to this variability, the area exceeds limit values imposed by EU laws, even if little, and for this it's needed to find solutions to keep the situation under control.

The scope of the living lab will be that of reducing air and noise pollution with small interventions in the neighbourhood that can be used as pilot project to be replicated.

3.2. Process to identify key issues

3.2.1. Issues diagram

The LOOPER Living Lab of Verona will focus on urban challenges related to environmental pollution caused by traffic and absence of natural mitigation measures (such as for example green areas). Some presence of industrial air pollution might be present in the area, but nowadays the industrial area is not active as a decade ago meaning that the pollution is mostly from traffic and buildings heating. We here separate pollutants linked to traffic as can be seen in Figure 5.

To evaluate these issues the parameters that will be analysed and measured will be air and noise pollution.

These parameters will be monitored using different methodologies and different tools.

Regarding methodologies, data will be acquired both by the national agency ARPA (Regional Agency for the environmental protection of Veneto) and by participatory data collection.

Tools used to collect this data are therefore different: both official instruments, such as, the mobile station of ARPAV, and portable devices operated by ULL members will be used.

In the following diagram (Figure 5), it is possible to see which are the main issues that can be found in the area. Please notice that: "Issue 3 – TRAFFIC" causes air and noise pollution but is also an independent issue; "Issue 4 – URBAN GREEN SPACES" is meant as lack of these.

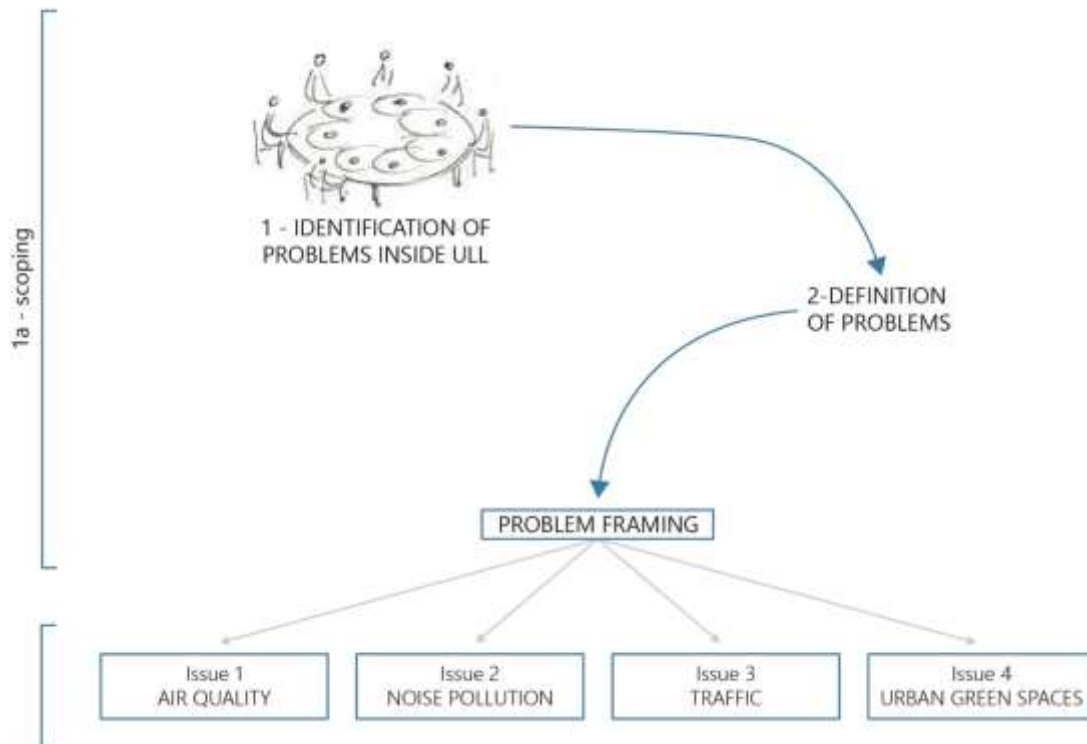


Figure 5 Problem framing of Verona ULL

3.2.2. Places of the issues

After all the preliminary meetings, the official start of the Verona LOOPER Living Lab meetings has been the 12th of December. After the meeting of December there have been other two meetings (24th of January and 7th of February) during which the first phase of scoping was successfully done.

To give some information, at the meeting of the 12th of December 2017 we had around 30 people actively participating and willing to learn more on pollutants and use of sensors. This first meeting produced useful results, in fact criticalities and measuring spots where actually found during this meeting.

With the second meeting of the 24th of January 2018 we had around 20 people participating. It was possible to show them some data about the acoustic planning of the City of Verona, and they better decided where to do the monitoring campaign considering both the criticalities they found during the previous meeting, and the possibility to apply mitigating solutions which the project can implement.

The third meeting on the 7th of February 2018 had less participants, around 15 people, but on later thought it might have been because the place of the meeting was in a more peripheric area which was of minor interest for people living closer to the industrial area and the Fair. Here citizens could have a lecture on how to use the geotagging web app and they could choose where to position some extra NO₂ passive sensors.

All the three meeting took place during weekdays after dinner (at 20:45) and in three different places to allow as many people as possible to participate.

To conclude, the three meetings where actually enough, and also useful, to produce a map of issues on the area with which it was possible to choose where to place the sensors for the phase of data collection.

The important aspect of choosing where to monitor was that citizens discussed and thought carefully on the identification of points in which to make the surveys but taking into account the fact that subsequently they will have to be able to propose mitigation solutions, and therefore physical places on which it is possible to intervene.



Figure 6 Verona LLL scoping map

4. DATA COLLECTION PLAN AND MONITORING TEMPLATE

4.1. What to monitor

The area of South Verona has a complex situation both from an urban planning point of view and from the environmental pollution point of view. The area is closed in-between two major highways (south and west), the train station (north) and a canal (east) which makes it difficult to connect it with the services and structures of the rest of the city which lies beyond the train station. The number of infrastructures and the presence of the industrial area make it possible to find higher levels of noise and air pollution. Also, the geographical position of the area makes the accumulation of air pollution easier.

The data that will be collected for the project are therefore: PM2.5, PM10, NOX, NO, NO₂, CO and CH₃ for air pollution; dB for noise pollution; and citizen “qualitative” feedbacks and reports via geotagging tools.

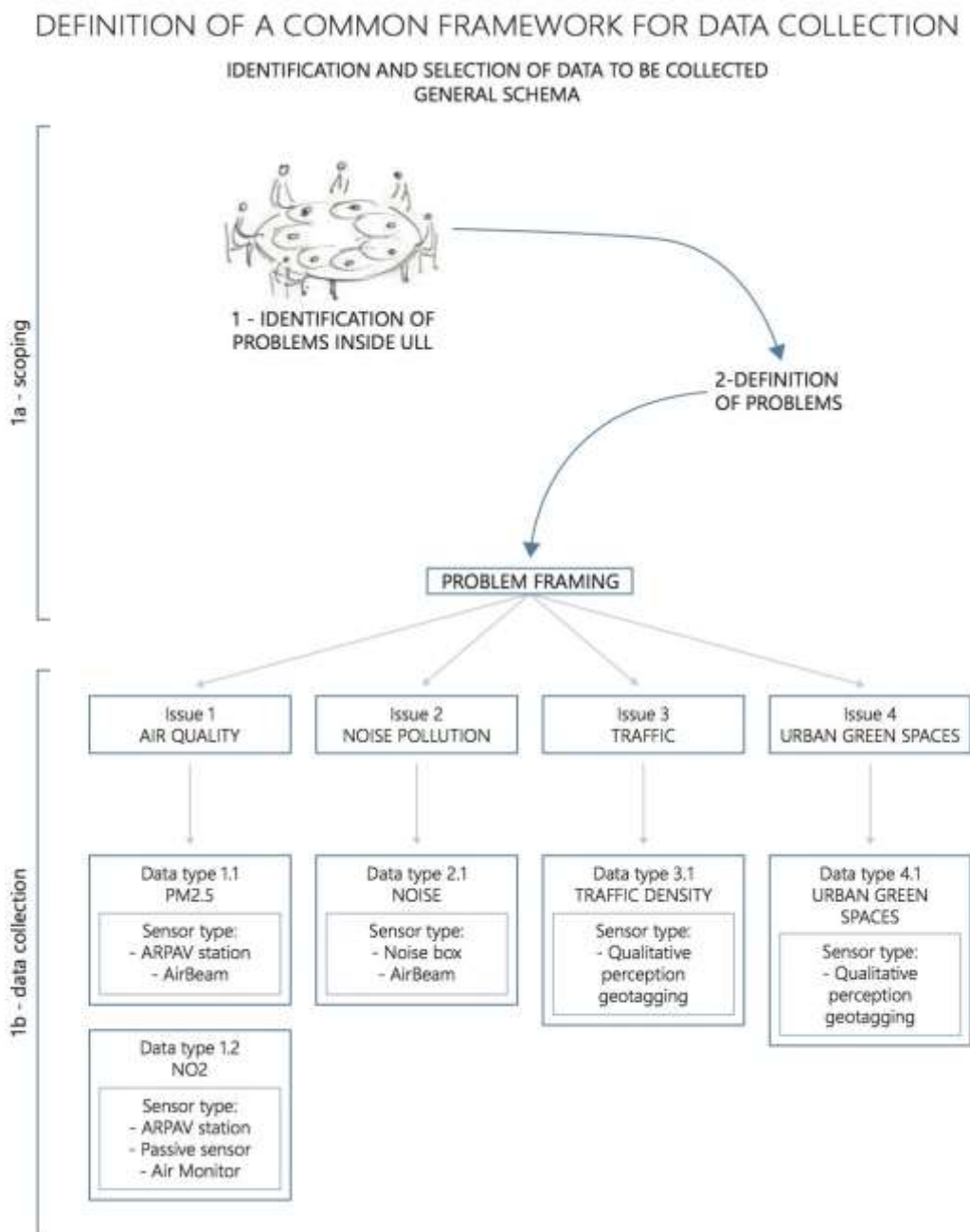


Figure 7 Problem framing of Verona LLL

ISSUE 1	AIR QUALITY
	Data 1.1: PM 10 (ARPAV)
	Data 1.2: PM 2,5 (AirBeam)
	Data 1.3: NO ₂ (Passive sensors ARPAV)
	Data 1.4: NO ₂ (Air Monitor)
	Data 1.5: NO (ARPAV)
	Data 1.6: NOX (ARPAV)
ISSUE 2	NOISE POLLUTION
	Data 2.1: dB(A) (OpeNoise)
ISSUE 3	TRAFFIC
	Data 3.1: Qualitative data
ISSUE 4	URBAN GREEN SPACES
	Data 4.1: Qualitative data

Table 9: Verona issue data tables

4.2.How to monitor

The first loop monitoring process has been done between February and April 2018 and to gain data have been used:

- Geotagging tool. People where given the instructions and knowledge on how to use it to collect qualitative data moving around the project area;
- 2 AirBeam PM2.5 sensors given to citizens, they were allowed to decide in between them who and for how long would use them. They created some common accounts to register data to incentivise people to use them;
- 2 noise boxes (the plan is to increase the number to 6). The noise boxes have been given, by turns, to 4 participants of the project whom positioned them in their houses (first floors);
- 64 passive sensors kits to monitor NO₂. The spots where 16 around the area of South Verona, the passive sensors where mainly positioned inside participants houses (ground and first floor). 2 kits where positioned also in schools, and others where positioned in front of two parishes, squares and public spaces. Every one of the 16 spots found by participants hosted two kits to have a comparison of data. The monitoring has been done twice: in February and in April, during the Vinitaly fair, for one week each;
- 2 ARPAV mobile stations used to monitor air pollutants (PM10, NO₂, total dust) and kept active continuously for 40 days;

- 1 ARPAV Skypost used to monitor PM2.5 and PM10.

4.3. Where to monitor

Following to the three meetings (12th of December 2017, 24th of January 2018 and 7th of February 2018) with the Verona LLL a monitoring plan was carried out. Monitoring places have been chosen with citizens, but they were asked to consider a set of characteristics of the place, and not only where criticalities could be found:

- Heavily used roads;
- Availability of space;
- Height from streets;
- Availability of electricity;
- Protection of the spot from potential vandalism.

During the decision process it was included also the area of Ca' di David with the positioning of 2 kits of passive sensors. The request of including Ca' di David came directly from members of the Comitato Verona Sud and of the Comitato Ca' di David, because the neighbourhood of Ca' di David is affected by high levels of pollution produced by the highway and from the main road of access to the city. In this area there is no monitoring done by the official agency, because of this the project wants to compensate this lack.



Figure 8 Data obtained from the first Verona LLL the 12/12/2017



Figure 9 Overlap of data from the LLL of the 12/12/2017 and from the Comune of VR

4.4. When to monitor

The monitoring campaign covers most of the winter period, when the levels of pollution are higher compared to the summer period, but it also covers until April, when there is the most important fair event (*Vinitaly*) which brings into Verona around 130.000 people in only 5 days. The *Vinitaly* event rises noticeably road traffic and air and noise pollution, while increasing the already present traffic discomforts.

5. DEFINE PLATFORMS

5.1. Define what online and offline tools will be used for data collection

The Verona LOOPER Living Lab is using the following tools:

- Tools for stationary surveys:
 - ARPAV fixed and mobile station;
 - Passive sensors;
 - Android Sound Level Meter;
 - iOS Sound Meter APP;
- Tools for mobile measurements:
 - GPS NO₂ CO logger;
 - GPS PM2.5 logger;
- Tools for qualitative data collection (feedback and report).

A better description of these tools can be found in deliverable D2.1 within 4. TOOLS FOR DATA COLLECTION.

As can be seen the tools for stationary surveys and mobile measurements are offline tools, on the other hand the tools for qualitative data collection are online tools.

5.2. Preliminary plan on which online and offline tools will be used for the co-design of options

It is important to understand that, as seen during the scoping stage, offline tools are the most suitable for the Verona LLL despite the effort the project puts in implementing user-friendly online tools. This because people find more feasible to work with face-to-face methods other than with online tools.

From deliverable D3.1 it is possible to find some online tools which can be helpful for the co-design stage (i.e. Transformcity), but for the needs of the Verona LLL it is also possible to implement the tools that are already used, a combination of the <http://www.loopertagging.eu/verona> tool and of the LOOPER website, to enhance the same result and keep the use of online tools as easier as possible considering whom are the participants. What will be done is to use online tools to collect also offline proposed solutions to have a general database which can be used during offline LOOPER Living Lab meetings.

6. IMPLEMENTATION PLAN

6.1. Situation of the area and the presence of citizens associations

In the area of South Verona there are two main residential neighbourhoods located on the sides of the main industrial area. The West part is under the district called “Circoscrizione Quarta”, and the East part is under the district called “Circoscrizione Quinta”. Both are extremely populated residential areas.

South Verona, as above-mentioned, is characterized by the presence of the industrial area of the City (ZAI – Industrial and Agricultural Zone), which includes the Verona Fair (Veronafiere). Moreover, other important traffic attractors can be found in the area, for instance shopping centres, supermarkets, Borgo Roma Hospital and the University of Verona (schools of Medicine and Surgery, Informatics, Biotechnology), and some of these opened recently (i.e. Adigeo shopping center, Esselunga supermarket, Bricoman).

With regard to the road network, there are other major traffic road besides the near motorway and ring road. Some of these are via Golino, viale Delle Nazioni/viale del Lavoro, via Dell’Alpo/via Roveggia, and Strada Statale 12, which are the main entry points to the city centre and to the industrial area.

The presence of these main roads induces cases of major traffic within the residential areas, where there is only a network of minor streets. This explains why the area frequently suffers from traffic congestion, particularly during important fair events.

Furthermore, the area only has few green spaces, which are both located in the East neighbourhood (San Giacomo Park and Santa Teresa Park), and there is a general absence of community spaces, cycle lanes and public transport.

In the area there is the presence of many citizens associations, including: Comitato Verona sud; Comitato Ca’ di David; Associazione Interzona; Centro Anziani in Borgo Roma. Furthermore, there are many associations which are involved in social care and support for patients (which we were not be able to involve in the first loop).

Citizens associations involved in the project mostly work on the themes of environment (age range 45-70 with heterogeneous educational level) or of recreational activities (age range 25-40 and/or senior citizens). It is important to notice that these citizens associations are raised as citizens feels that there is the need to fill some gaps created by the Public Administration.

This lack of trust between citizens and policymakers is mostly due to the decision of the previous Administrations to allow the construction of many commercial areas, but from the other side policymakers did not trust citizens to structure a dialogue as they were too centred on their ideas and they were not willing to build a dialogue on nothing different from what they wanted.

From the LOOPER project point of view it was possible to gain much participation from stakeholders as we are working on urban issues which are of their interest, but we were also able to use each possible communication channel in order to spread the word about milestones and future meetings.

6.2. Strategy about ULL structure

People involved in the Verona LOOPER Living Lab were divided into sub-groups of no more than 10 people (see fig. 10) and, thanks to the use of paper supports (such as maps of the area), it was asked to them to identify the criticalities of the area of South Verona: streets; crossroads; persistent problems of traffic jam; big traffic attractors; green spaces or absence of it. It was also possible to map participants places of living and/or working, according to the features of buildings, to check where it was possible to place sensors during the co-monitoring phase.

Every citizen/stakeholder that participated was able to give his/her suggestion on the problems of the area and was able to make suggestions on the monitoring to be carried out.

DEFINITION OF THE LIVING LABS

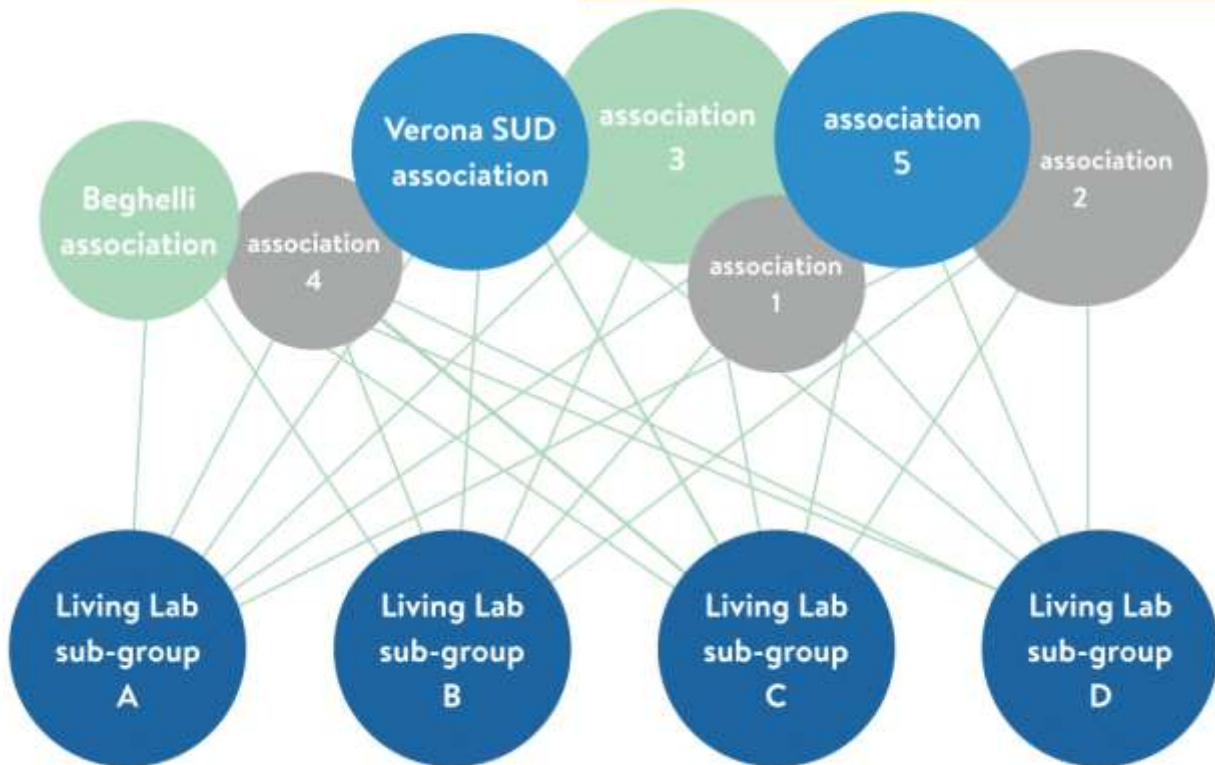


Figure 10 schema that exemplifies the division of ULL participants into sub-groups

6.3. Preliminary action plan

Before the official beginning and inception of the Verona ULL some preparatory meetings have been done.

During the preparatory meetings, some of the citizens associations participated, and it was explained to them the scientific aspects of some problematics that have been found in their area during the drafting of the project.

More specifically some lectures, made by Iuav professors, on the topics of air pollution, noise pollution, measurements methods and sample laboratory analysis were given. This was useful to explain to citizens the technical aspects that usually they don't know.

Another important aspect of the preliminary actions was that of making citizens feel as they are part of the project since even before the start of it, making them feel more willing to participate actively on the project.

6.4. First meeting with stakeholders

During the first meeting with stakeholders the project was presented by University Iuav, Comune di Verona represented by the Environment alderman Ilaria Segala, and Legambiente. The presentation meeting was held in the Sports Hall (AGSM Forum), which is located not too far from the area of the project, this has been done to facilitate the participation of citizens to the meeting.

During this meeting it has been explained the goals of the LOOPER project, the methods that will be used and the timing, and it was asked to those present to join the project by filling a questionnaire. The

questionnaire collected data on single participants, such as adhesion to a citizens committee and availability to participate to the project by keeping a sensor in their houses. During the meeting also emerged that the main issues to be found in the area where the ones already hypothesized: traffic related issues which cause bad air quality and low quality of life for people living in the area.

The alderman received some criticisms on the topic of the planning of the area of South Verona, as it was representing the Comune di Verona; it has to be noticed that the current Administration is of recent installation. The alderman gave availability to discuss on the issues emerged to try to improve the conditions of the area of the project.

6.4.1. Presentation of LOOPER project

During the meeting, after a brief introduction made by the alderman, the University Iuav started presenting the project in all its aspects: from the relationship with the other cities participating in the project to all the technical aspects, included the timetable to be followed for every step that has to be done.

Later the Comune di Verona analysed the aspects related to the pollution situation of South Verona and the urban planning problems that can be found, renewing the availability to interject with the project partners and with citizens for the proposal of mitigation solutions.

Legambiente moderate the speeches and collected participants doubts and questions.



Figure 11 Verona LLL preliminary meeting



Figure 12 Verona LLL preliminary meeting

6.4.2. Request for participation

The questionnaire to be filled in for participation, which was handed to citizens during the presentation meeting of the 22nd of November 2017, requested the following information:

- Name and Surname;
- email address;
- age (<15, 16<28, 29<50, >50);
- if they live/work in the area, if yes in which part (they could also choose the option "i do not live or work in Verona Sud");
- if they are part of a citizen association (or to a group), if yes to which;
- if they would be available to keep a sensor in their house, if yes which is their address;
- acceptance of use of data (privacy standard formula).

During the meeting of the 22nd of November there was a good level of participation, as around 60 people participated and gave their willingness to participate to the Verona LLL meetings and to participate actively to the project.

More than half of the people who gave the availability are over 50 years old, and have different genders, family statuses, etc.



Figure 13 Participation questionnaire handed to citizens

6.5. Verona LOOPER Living Lab timeline

As said in the beginning the Verona LLL works as a tester for the other LLLs. This can be seen in the timeline as the data collection period goes from February to April, while the other LLLs monitoring period goes from May to August.

In the timeline that can be seen below the Verona LLL will realign with the other LLLs with the co-design phase but will keep the data collection stage ahead of time.

The first co-design stage will last from October to November 2018, as the period from July to September 2018 is used for a preliminary data visualisation. Next to it the first action (implementation) period might not end in January 2019, but it might continue also in February/March 2019 in order to activate a second co-monitoring phase while mitigation solutions are still active in order to gain more reliable data on what works and can be furthermore implemented.

TIMETABLE

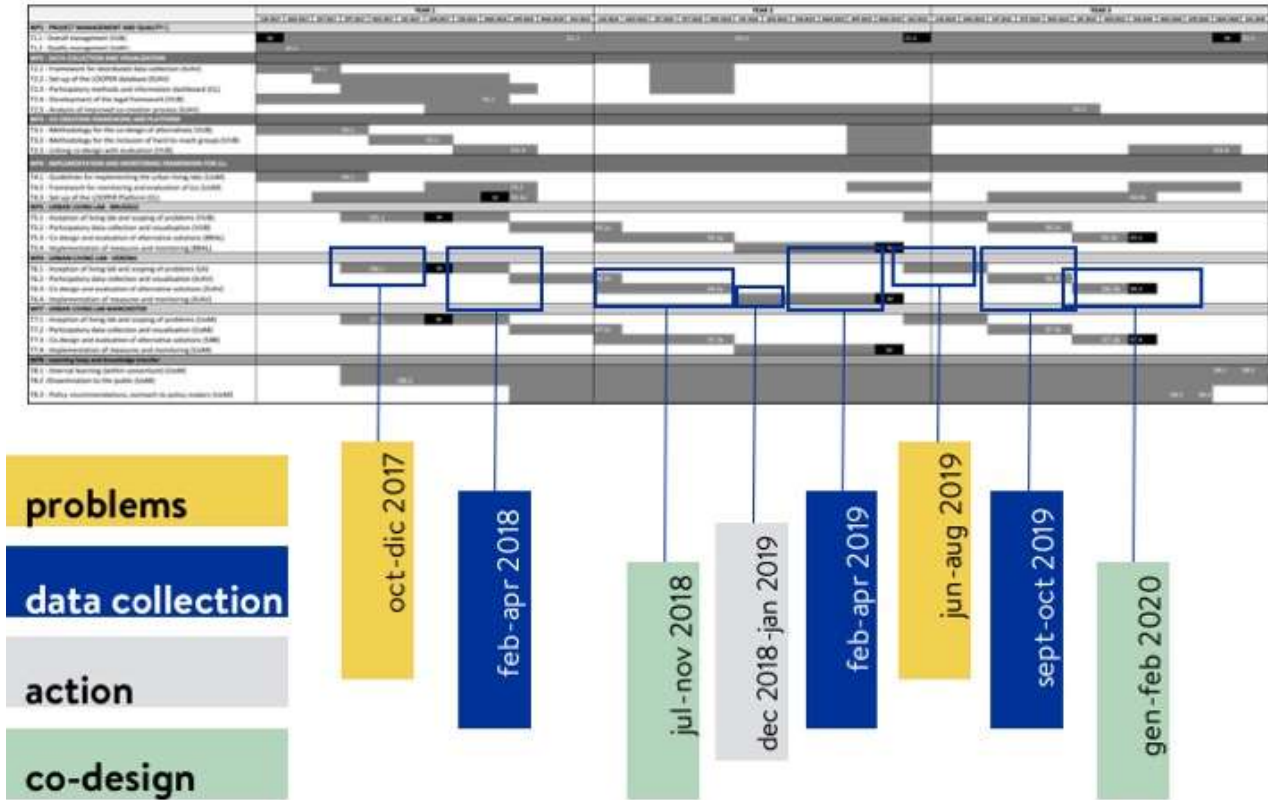


Figure 14 Verona LLL implementation plan timeline

7. ACKNOWLEDGEMENTS

The support of Brussels Capital Region – Innoviris (Belgium), Ministero dell'Istruzione dell'Università e della Ricerca (MIUR) (Italy), the Economic and Social Research Council (UK) and the European Union is gratefully acknowledged.

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