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LOOPER

LEARNING LOOPS IN THE PUBLIC REALM

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Authors: Joe Ravetz (UoM), Massimiliano Condotta (IUAV), Chiara Scanagatta (IUAV), Fabio Peron (IUAV), Jesse Pappers (VUB-MOBI), Sara Tori (VUB-MOBI), Imre Keseru (VUB-MOBI), Cathy Macharis (VUB-MOBI)

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Colophon:

This report version 1.0 is a final working version (subject to further amendments as necessary).

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1 INTRODUCTION & OVERVIEW

1.1 Summary of the Looper

In cities all over the world, local people face similar problems: How can our kids get to school in safety? Where are all the buses? Why does local government seem to not care about us?

Meanwhile, local governments also face similar problems, from the other side of the table: How to mobilize the resources of the community? How to find out more about what they want or need? How to use this to provide better services at lower cost?

*The **Looper Model** starts to bridge this gap. It shows how community-based visioning and design can lead to better neighbourhoods. We call this **'co-creation'** – active involvement and empowerment of citizens, to collect data, design solutions and monitor the outcomes.*

*The Looper Model is a set of methods and tools to support local co-creation. It works with 'learning loops,' which bring together local knowledge with local decision-making. The **Looper Toolkit** comprises online and offline tools to support the learning loops.*

*Three **Looper Living Labs** in Brussels, Manchester and Verona, each developed and tested the Looper Model and Looper Toolkit.*

All this helps to keep people 'in the loop', and to 'close the loop', so that local knowledge can lead to local action. The Looper Model in any city can help with practical solutions for air quality, noise, traffic safety, security, greenspace and other challenges in the public realm.

1.1.1 About this document

This document is the Synthesis Report on the Looper project and the Looper Model which it has developed.

Policymakers, community groups, local government, and providers of housing, transport, security or open space can all use the report and try the methods and tools. The report also should be useful for professional bodies, civic society, consultants, students, and researchers.

The report is structured as follows:

- *Introduction*
- *Case studies*
- *Toolkit and Platform*
- *Evaluation and learning*
- *Conclusions and recommendations*
- *Review of project objectives*
- *Annex: literature review, references and summary tables.*

Text in italics in the green boxes are the summary/overview for each section.

Further information is on the project website – www.looperproject.eu

1.2 What is the Looper model?

The **Looper Model** is a new way of improving neighbourhoods and cities. It includes not only data for technical problem-solving, but also the human side of co-creation, via the 'learning loops'.

A **learning loop** first sets up a collective debate on priorities, with participatory citizen monitoring. A community-based visioning, and design and evaluation process follows, and then real improvements are made, with feedback on the outcomes.

A **Looper Living Lab** can be set up with the structure of the '6-P': people, place, priorities, policies, platform and process.

The **Looper Toolkit** includes monitoring kits for pollutants and/or urban issues, tools for visualisation, evaluation and decision-making, online or offline tools for citizens to explore ideas and designs.

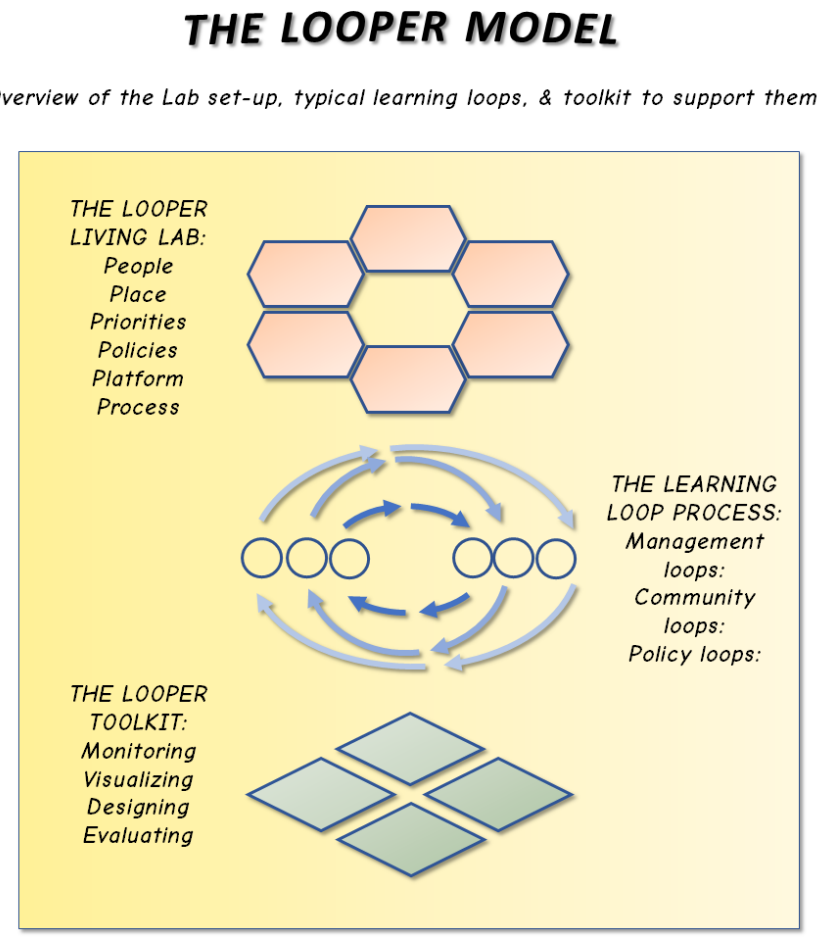

Figure 1 Looper model

Overall, the Looper Model can help to:

- Build detailed knowledge (online and offline) of problems and ideas.
- Increase community empowerment and self-reliance.
- Make local governance more effective, which is more responsive to local needs.
- Bridge the 'democratic deficit', the 'trust gap', and the challenge for government and public services to do 'more with less'.

By linking with community issues and ideas, policymakers can focus plans and investments more effectively on the real problems, building trust between citizens and public bodies (i.e. a 'policy loop'). For communities, monitoring problems and co-creating solutions, helps to build empowerment (i.e. the 'community loop').

1.3 Who can use the Looper Model?

- Citizens who want to improve the places where they live and work.
- Urban planners who are open to new ideas from the community.
- Local policymakers ready to build trust and co-create solutions with local people.
- Other public bodies who aim to transform the neighbourhood and city around them.

What are the Looper living labs?

The Looper Living Lab is where the Looper Model is put into action. It is an experimental zone where new ideas can be tried, and new ways of co-creation can be tested. Inside the lab, there can be any number of loops for different problems, from purely technical issues, to wider social challenges.

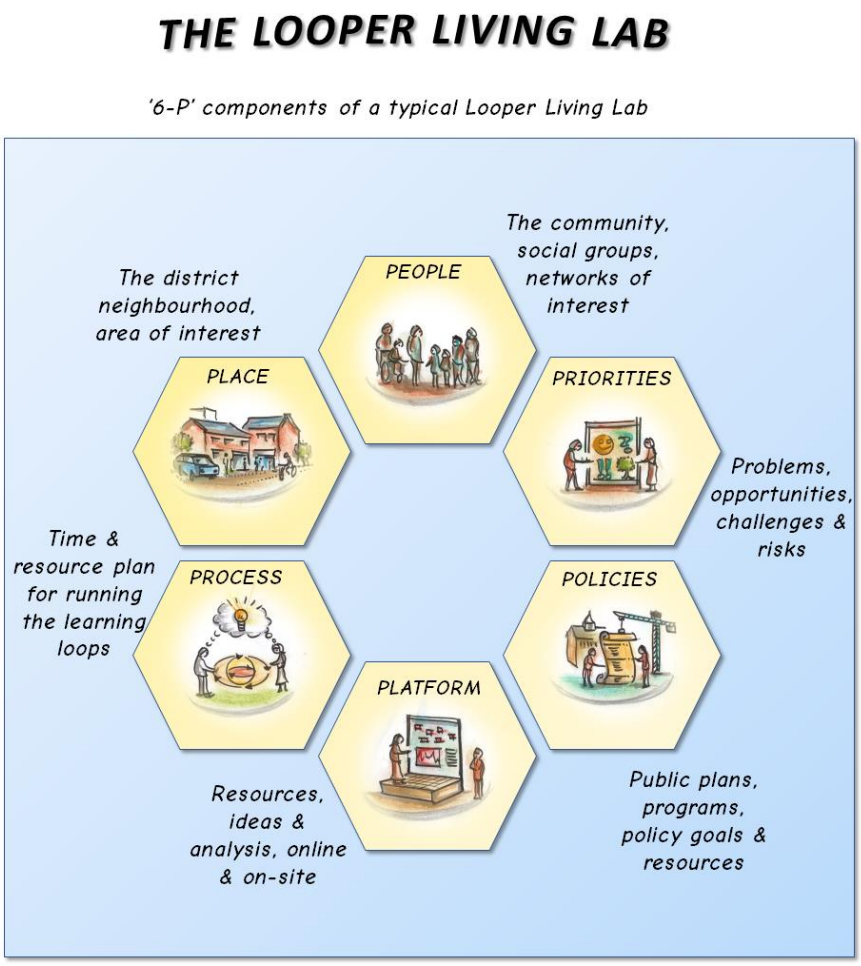

Figure 2 Looper Living Labs and the ' 6-P' model

Each Lab includes six main components, the so-called '6-P'.

- **Place**: we (i.e. the Lab organizers) define the place (a local neighbourhood, district, landscape, or other area on the ground), where the lab is to be based.
- **People**: we gather the people to be involved (networks, organizations, groups or communities). We need ways to mobilize their energy and commitment, to mediate conflict, and find ways to turn problems into opportunities.
- **Priorities**: we work with the *people* in the *place*, to explore their *priorities* (problems, issues, challenges, risks, hopes or fears, ideas or opportunities). This includes both negatives and the positives which can inspire and motivate.
- **Policies**: we set the scope of problems and possible solutions towards the policies (local, regional, national) for that area, and aim to engage with the policy process, which can be long and complex.
- **Platform**: we develop a system for the exchange of information, learning, debate, analysis and insight. Such online platforms see new and exciting technology every day, but the real purpose of the platform is about improving human interactions.
- **Process**: we look for the overall insights, from the whole experiment from start to finish, in order to improve and transfer the learning to other places, or other applications such as public services.

The Looper Model and Toolkit were developed and tested in three living labs in Brussels, Manchester and Verona, with very different conditions.

1.4 Learning loops

A learning loop is about building the community-based knowledge and creative thinking, which can turn problems into solutions. Each learning loop has three main stages:

- **Problem identification**: we identify the issue, set up citizen monitoring, visualize and analyse.
- **Co-design**: we create options and decide which should go forward.
- **Action and feedback**: we make real improvements (physical or social) and monitor impact.

The Looper project ran a complete first loop, and then started a second loop, building on the results of the first. In an ideal model of community development, these loops would continue as a regular part of local governance. The time needed for each loop can be weeks, months or years, depending on local conditions.

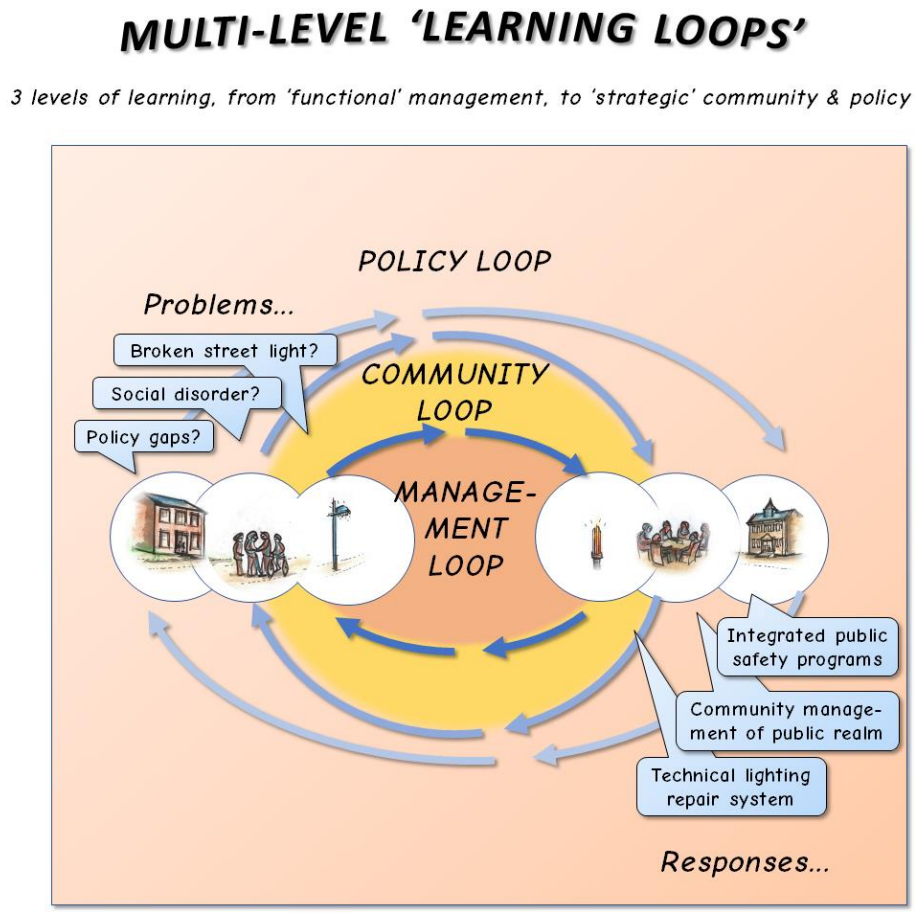

Figure 3 Three levels of 'learning loops'

Three main types of learning loops emerged in the Looper project. These are illustrated here with the typical example of a broken streetlight, which seems to attract social disorder and crime:

Management loop

This 'functional' learning loop works with detailed information on practical or technical problems and solutions. It can use both online and offline platforms *(for example, to locate the streetlight and get it fixed).*

Community loop

Here the citizens are 'in the loop', via local empowerment, social enterprise and self-reliance. We work with 'deep engagement' methods such as active outreach and community visioning, with networks and communities of interest (e.g. to debate the wider issues of public security and how community action can help).

Governance loop

Local government and other bodies can enhance their organizational learning and 'strategic policy intelligence' (capacity for thinking ahead). This loop helps overcome the 'trust gap' and enables government and public services to 'do more with less', (for example to develop better policies on public safety and social inclusion).

Successful local development will bring these loops together, each with its different ways of 'know-what, who, how or why':

- **information ('know-what')**: what causes the streetlight problem?
- **networks ('know-who')**: who to ask for advice?
- **skills ('know-how')**: how to set up a neighbourhood security project?
- **norms/goals ('know-why')**: why is this a priority?

1.5 Looper toolkit

The Looper Model includes the use of digital tools and methods to support the learning loop process. Such tools and methods are used for monitoring, visualisation of data, co-design and evaluation. The toolkit includes: (see details in Section 3)

Environmental monitoring:

- Air quality, with mobile low-cost handheld devices,
- Noise monitoring, with smartphone, the OpeNoise (or similar) app and a calibrated microphone.
- Traffic monitoring, which can be manually measured or with automatic devices such as Telraam.
- Other urban conditions such as crime and security, greenspace, and urban pollution.

Visualisation and analysis:

- Spatial data platform: the visualisation dashboard needs to be as user-friendly as possible, and various platforms are available.
- Multi-criteria analysis and evaluation of co-designed ideas, where possible with Multi-Actor Multi-Criteria Analysis (MAMCA), or a non-technical equivalent.

Co-design and engagement:

- Co-design tools and methods: both offline methods and online platforms are analysed in the Looper library of tools. Based on our experience, these tools and methods can be integrated with basic participation methods, such as large printed aerial views of the neighbourhood.
- Co-design platform: online idea-generation tools provide the opportunity for citizens who would otherwise not attend workshops, to propose solutions and discuss them online.
- Community engagement: including 'active outreach', where researchers are involved in local activities and networks, with an open door to all local problems and ideas.

1.6 Looper process and method

Each learning loop is a process in time, with 3 main stages. Each of the loops has a 'problem/opportunity' phase, a 'co-design/evaluation' and 'action/feedback' phase:

1) ***problem identification stage****:* including scoping, data gathering, visualization, analysis and evaluation; this should include not only 'problems' but also 'opportunities';
2) ***co-design and evaluation stage,*** of responses and options and their evaluation; and
3) ***action and learning stage*** (i.e. 'implementation'): including co-design of options, evaluation of options, implementation/construction on the ground, monitoring and feedback.

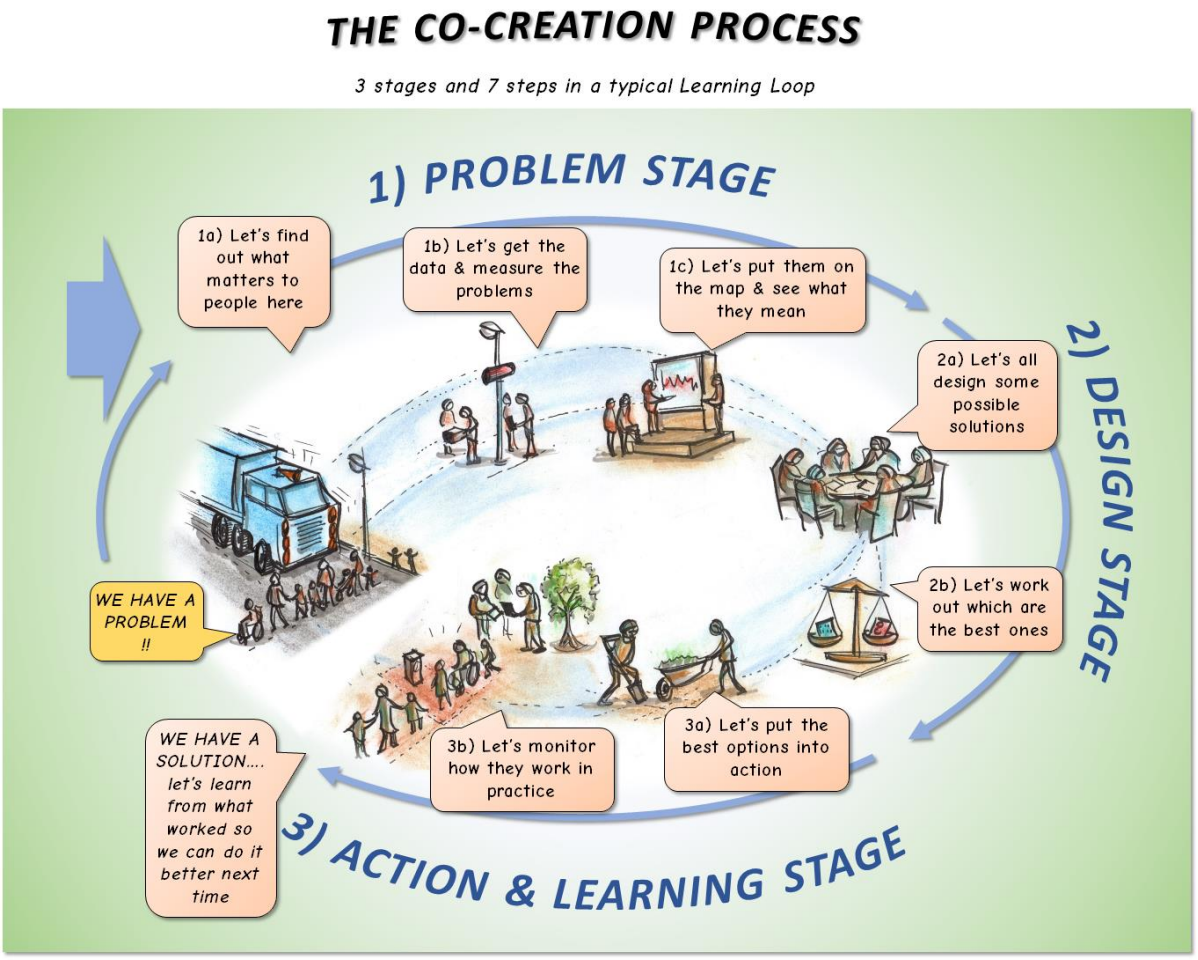

Figure 4 Looper co-creation process: stages and activities

When the Lab is set up, the participants can work on any number of interventions, each with its own learning loops (e.g. air quality, noise, street crime, greenspace). Each intervention will follow a more or less similar process, with the typical steps including. In practice the steps and methods are very flexible, to fit the local situation, and the needs and ideas of local communities.

The Learning Loop can repeat, if there is time and resources, for further improvements. Within the Looper project, we took time to set up the structure and guidelines and Living Labs: then we completed one cycle with monitoring and feedback, and then started the second cycle, up to the co-design stage.

1.6.1 Problem identification phase

1a) SCOPING

Citizens explore and debate on what matters to them in the neighbourhood. This covers both problems and possible opportunities; and physical or social issues. We aim to engage with all parts of the community, particularly those who are excluded in some way.

1b) DATA COLLECTION

Low-cost digital monitoring tools can be used by residents for practical issues such as air and noise pollution, traffic, safety or greenspace. The results are then uploaded to an online platform, which can be checked with official monitoring stations.

1c) VISUALISATION

The results are visualised with online maps, to show the nature of the problem over space and time. For participants who prefer non-digital, we provide physical resources for workshop discussions, on what the collected data means, and how we can respond.

1.6.2 Co-design phase

2a) CO-DESIGN

Residents and other stakeholders come up with ideas to solve the problem. These can include interventions in public spaces, social actions or special events. We generate a range of design concepts, from initial ideas to sketches of how they would look on the ground.

2b) EVALUATION

Before going ahead, we evaluate the co-designed options, with a multi-actor multi-criteria analysis (MAMCA[1]), or the off-line equivalent. This evaluation helps to form the shortlist for action by checking for possible conflicts and synergies between the people and stakeholders affected. (Note: some kind of evaluation may also be needed at other points in the cycle).

1.6.3 Action and feedback phase

3a) ACTIONS

Actions and 'interventions' are put into practice. These can be physical improvements (traffic calming and green spaces) or social actions (e.g. walking plan for schoolkids; a health plan for those vulnerable to pollution). Some of these may take time to get budgets and permissions.

3b) MONITOR and FEEDBACK

We monitor closely the effects of the interventions. Where possible, we use the same method used to measure the problem. Then we discuss the results with residents and policymakers. We aim for all stakeholders to learn from the experience, so that the next loop can be improved.

1.7 Problem structuring and framing

Experience from Looper and similar projects shows the importance of 'problem framing and structuring'. Much recent citizen-based research work demonstrates the multiple levels of priority, which are often confused, especially by more deprived/excluded communities who suffer a wide range of problems in everyday life.

[1] www.mamca.be

The simplest way of framing is with simple definitions of 'functional' and 'strategic' levels of analysis and action. This is demonstrated here with a traffic/air quality example:

a) Functional issues with directly functional solutions: e.g. localized traffic risk which requires a local sign or crossing; (this can be done if funding is available);
b) Functional issues with strategic responses: e.g. localized traffic problem which requires a city-wide plan; (this has to fit with longer regional cycle);
c) Strategic issues with strategic responses: e.g. area traffic problems, calling for a national transport plan; (has to connect with national political cycle);
d) Strategic issues with structural challenges: e.g. area traffic problems as a result of inequality and exclusion, calling for a rethink of societal structures (has to connect with transformation potential).

Too often public participation confuses these different layers, causing frustration and alienation. The three types of learning loops above are based on the 'functional/strategic' differences: but on the ground they are often mixed up with conflicting views. For example, with (a) '*Functional issues with feasible solutions*', local citizens may decide a high priority for a particular location, but the City Council may have other views which are balanced across the area.

For future Living Labs we need to explore further ways to map and visualize these different kinds of boundaries/layers, and to explore the different levels of analysis and action which are most relevant.

These questions also highlight the importance of the public policy cycle in spatial planning, housing, transport, health, security, education and public services of all kinds. These cycles typically work over 5-10 years, and each faces similar questions on consultation / participation / engagement with grassroots initiatives. The success of any future Looper Living Lab depends on working closely with policymakers (and also where possible to involve them as partners from the very beginning), and adding value to these policy cycles (but also to put up challenges and confrontation where necessary).

1.8 Context: what are we aiming for?

Generally, the Looper Living Lab is an experiment to test how far we can improve neighbourhoods and whole cities, to be more liveable, prosperous, equal and empowered. What does this mean in practice?

The 'syndromes' ('endemic problems') are all around – polluted and unsafe urban environments; communities displaced by profit-seeking development which serves international finance; under-funded and under-performing local government; distrust and alienation in the excluded and 'left behind' communities.

The synergies (visions and opportunities for collaboration and co-production) are there to be explored. We can enable the empowerment of communities by active co-production in housing, social enterprise, public realm and public services. We can design the public space in a city for humans and social communities, not always for private cars and financial profit. We can improve public services by involving users and clients, along the principles of 'co-production'. Such ideas are visualized in Figure 5, with 'syndromes' (problems) on the left, and 'synergies' (solutions/opportunities) on the right.

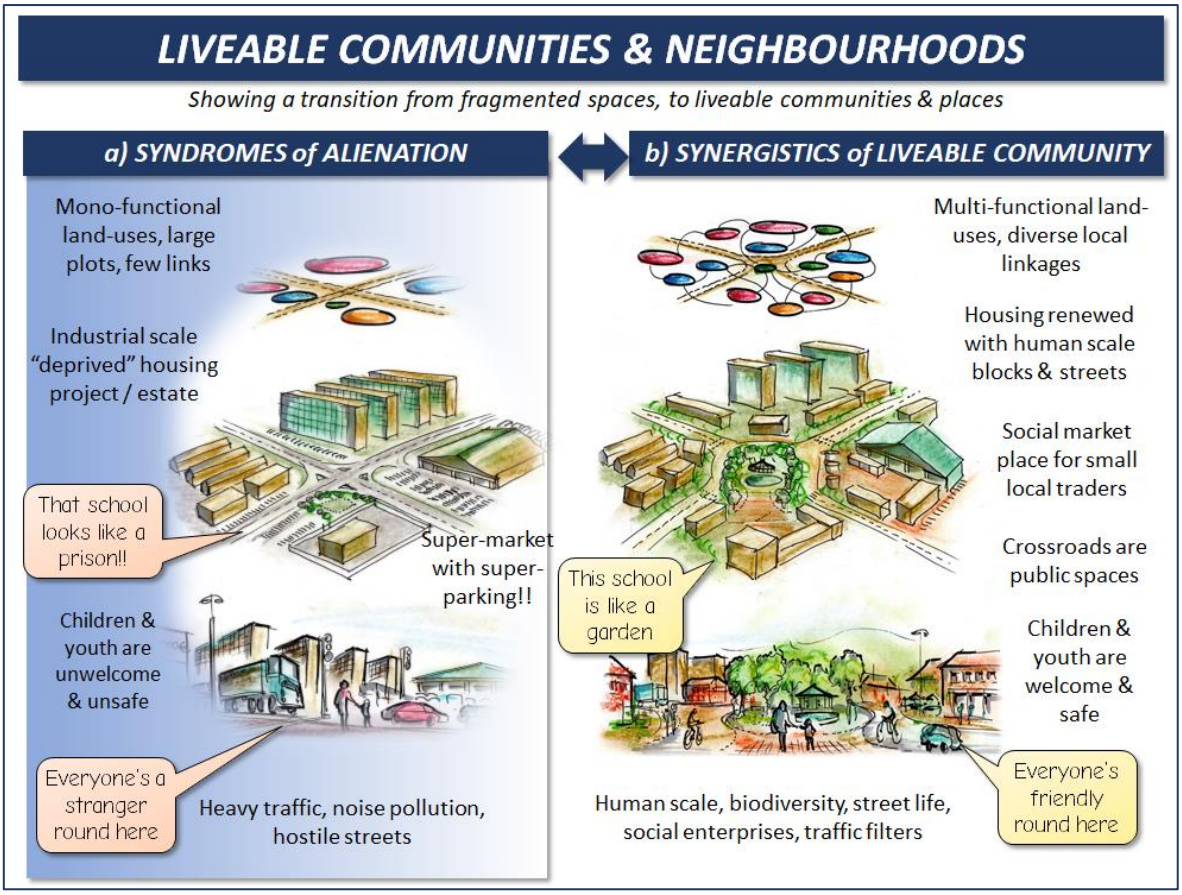

Figure 5: Liveable Communities and Cities

This is not all a new agenda. Actually, improving neighbourhoods has been a challenge, for local government, urban planning and community development professions, for over 50 years. But the Looper project now brings some new and powerful insights:

- Insights on the 'learning capacity' of the system: here framed as 'management loops', 'community loops' and 'governance loops.'
- New digital tools for monitoring and visualization, with digital platforms to help with information/knowledge management.
- New methods for social engagement, participation, elicitation, alignment.
- New methods for policy innovation, social innovation, organization innovation.
- The Living Lab approach to urban experimentation and transition.

These various processes are summed up in the graphic as comparison:

- Linear-adaptive civic design (on the left): narrow problem solving, driven by power and money.
- 'Synergistic' civic design (on the right): holistic, integrated, participative, inclusive, with methods such as Planning for Real, and new digital equivalents.

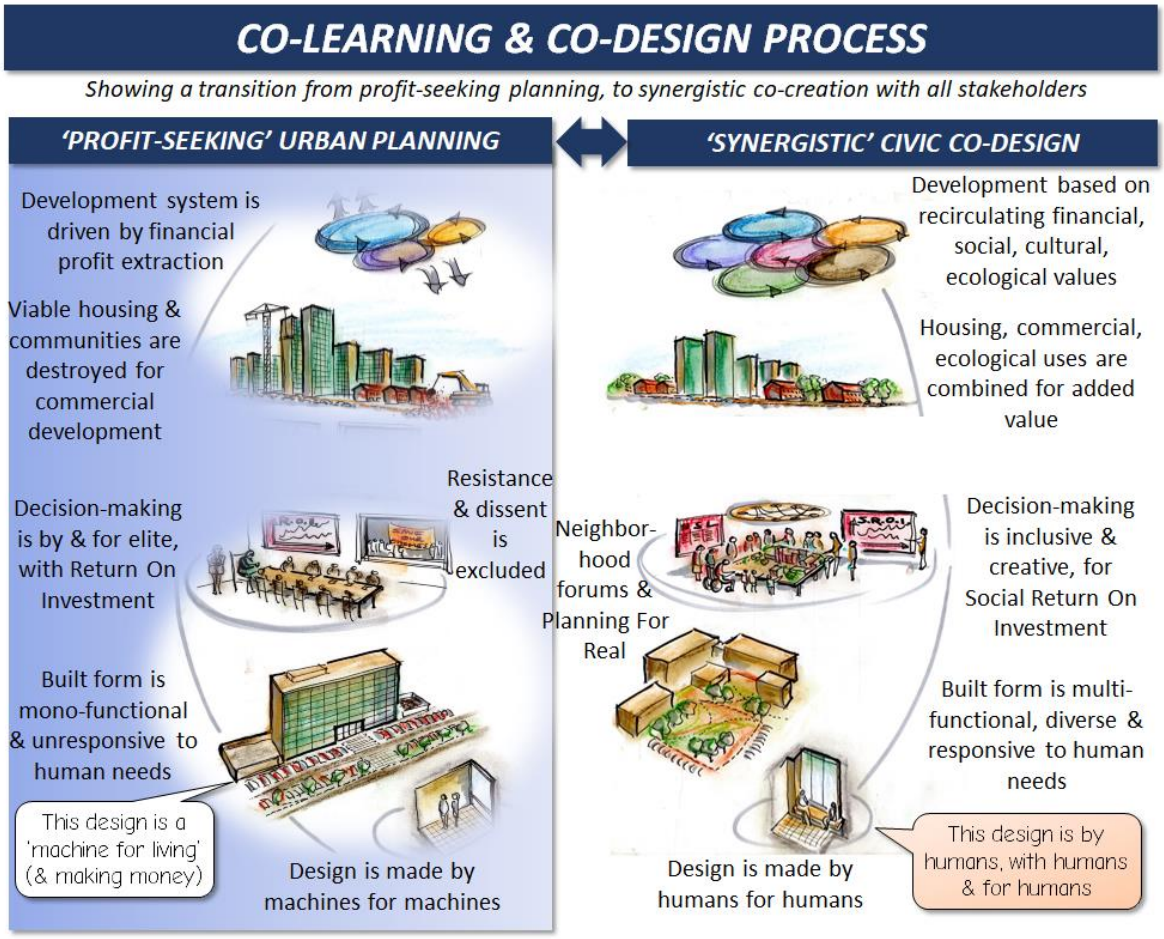

Figure 6: Co-learning and co-design process

1.9 What are typical Looper issues and interventions?

Looper worked with a range of interventions and 'use-cases', i.e. common examples of practical problems and responses in urban communities. Each issue has a different set of problems, opportunities, design issues, political pressures etc. Each issue has some combination of 'functional' loops for technical considerations, and 'strategic' loops for social/political considerations. Here are some brief notes:

a) **Air quality:** to analyse the problem, citizens can use hand-held monitors, compare their data with official measurements, and analyse with mapping and visualization. For the co-design of responses, there are some local actions (planting trees, retrofitting of buildings to reduce heat loss), and social innovations (public health info, travel adaptation). But major progress would require city-wide policies for industry and transport. This points to a 'strategic' learning loop: getting information into the hands of the community enables and empowers them to argue their case.

b) **Road safety and parking:** the community can map the problem with technical data and other media and compare with official data. For the co-design of actions, the options include technical responses (e.g. traffic calming), policy responses (regulation, enforcement), or social responses (a 'walking bus' or helping kids to cross the road). There are also strategic issues raised by parking by outsiders, in the context of gentrification. Here, a strategic learning loop should help to empower the community, mediate conflict and guide policy.

c) **Noise pollution:** this may be a local issue, which calls for local data and participative debate. The co-design process will look at social innovation for collaboration between neighbours or different parts of the community. Also, it may be an issue coming from outside the community, from roads, industry, sports or leisure. This might call for physical solutions (e.g. barriers, traffic calming, which can be expensive), and/or policy solutions (e.g. regulation, enforcement).

d) **Crime and security:** this involves several kinds of problems and responses: perceived insecurity, harassment, and anti-social behaviour which calls for social mediation and/or enforcement; property and personal crime which needs physical action and/or law enforcement; organized crime/terrorism needs higher-level intelligence and enforcement (generally outside the Looper scope). In each case, the technical data (e.g. crime incidents) needs to go alongside social deliberation and co-design for possible solutions.

e) **Greenspace**: this often shows problems of anti-social behaviour, conflict between users, or local pollution, for which data can be gathered and mapped. Greenspace also brings many creative opportunities, not only for physical works, but including nature conservation, education, health, local food, cultural events and festivals. For community participation in co-design of the built environment, greenspace is a good place to start.

f) **Technical services**: this covers a range of activities or functional services in the public realm, such as streetlights, holes in the road, and broken fences. Each has a clear definition of problem and solution, with a functional learning loop. Such loops are suitable for 'smart' technologies which can greatly improve monitoring and technical decision making.

1.10 Reality checks

In an ideal world everything in the Looper Living Lab runs just as planned:

- ***Place***: a suitable neighbourhood is identified with clear boundaries.
- ***People***: residents and stakeholders are easily mobilized and are happy to work with researchers.
- ***Priorities***: problems and opportunities are identified, which are suitable to work on.
- ***Platforms:*** are set up as planned, with a steady flow of information and exchange of participants.
- ***Process***: an experiment is set up, problems are monitored, options are designed, and results are evaluated.

Then we can compare the ideal model with the typical realities:

- ***Place***: local problems are caused by external forces, such as inequality or austerity.
- ***People***: there is tension or conflict between different groups and communities.
- ***Priorities***: problems and responses don't match the available resources.
- ***Platforms***: the information is patchy, technology isn't understood or doesn't work as promised, participants are not satisfied.
- ***Process***: the stages get all mixed up, there are many barriers and gaps, expectations are disappointed.

Many community issues do not fit easily into the templates and loops shown above. Practical functional problems such as parking, may be the result of gentrification and lack of public transport: and functional problems in housing may be the result of structural privatization and inequality. As for policy responses, these are often under-resourced, under-informed, patchy, and local government often gets the blame for problems it cannot solve. Behind many efforts at community participation is a power relation, between community and policy, or between experts and citizens (these are reviewed in the co-design section below, and in the Annex).

All these are then the challenges for the Looper Model and Looper Toolkit to address.

2 THE LOOPER LIVING LABS

2.1 Looper Living Labs in three cities: overview

The three Living Labs in the Looper project had very different spatial, cultural and thematic contexts.

The Brussels Looper Living Lab is situated in Helmet, a neighbourhood with many traffic safety problems, within the municipality of Schaerbeek in the north of the Brussels Capital Region. Its location was selected after consulting local and regional governments as well as NGOs in the area. The living lab was set up in February 2018 and is run by the Mobility, Logistics and Automotive Technology Research Centre (MOBI) at the Vrije Universiteit Brussel and BRAL, a Brussels citizen NGO.

The Verona Looper Living Lab is located in the south of the city of Verona. The borders of Verona South are delimited by train tracks, roads, and a river. Air pollution in the area is a problem as it exceeds limit values imposed by EU laws. This problem is partly caused by the city's location in the Po Valley but is exacerbated by the emissions of old heating plants as well as mobility related emissions. The Verona Looper Living Lab officially started in December of 2017. The lab is run by Iuav University of Venice with the cooperation of environmental NGO Legambiente and the City of Verona.

The Manchester Looper Living Lab is situated in the Brunswick neighbourhood, a former social housing estate close to the city centre that is undergoing regeneration. The neighbourhood has a diverse population and is bordered by major roads on three sides. The Manchester Living Lab explores five interconnected issues: air quality, traffic safety, security, community spaces and greening. The University of Manchester is the coordinator of the Living Lab but works in cooperation with the social housing organisation S4B.

Figure 7 The three Looper Living Labs

2.2 Brussels Living Lab

2.1.1 6-P Summary of the Brussels Looper Living Lab

	OUTLINE
PEOPLE	Residents of the Living Lab neighbourhoods and parents of children who attend school in the neighbourhood.
PLACE	Two residential districts in the Schaerbeek municipality.
PRIORITIES	Traffic safety
POLICIES	Residents feel unsafe on the streets and the municipality is trying to figure out a policy response.
PLATFORM	Offline: workshops, visits, street presence. Online: local platforms.
PROCESS	Ambivalent attitude of municipality towards the project frustrated the implementation.

Table *1 6-P Summary of the Brussels Looper Living Lab*

2.1.2 First loop

2.1.2.1 Overview of the area

Helmet is a neighbourhood within the municipality of Schaerbeek, which is located in the Brussels Capital Region (see Figure 8 and Figure 9). Helmet is a diverse neighbourhood with an individual character and many independent well-established shops along its central high street, the "Helmetsesteenweg/Chaussee de Helmet". The Helmet district urbanised in the early twentieth century. Together with surrounding areas, the layout of the district was redesigned to include wide avenues that depart from squares or roundabouts.

The neighbourhood had over 12,500 inhabitants in 2016, 24% more than in 2006. Almost a third of the population in Helmet does not have the Belgian nationality, which is less than the average in Brussels. The population is young compared to the Brussels average and has a high share of children and an average amount of couples with children. Helmet is above the Brussels average with an unemployment rate of 27.2%. With €17 000 in median annual income in tax declarations it is also far below Brussels average.

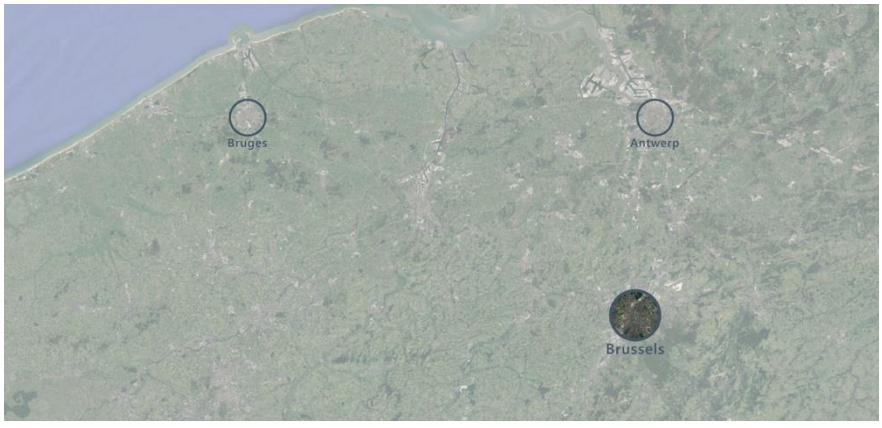

Figure 8 Location of Brussels with comparison to Antwerp (North) and Bruges (West).

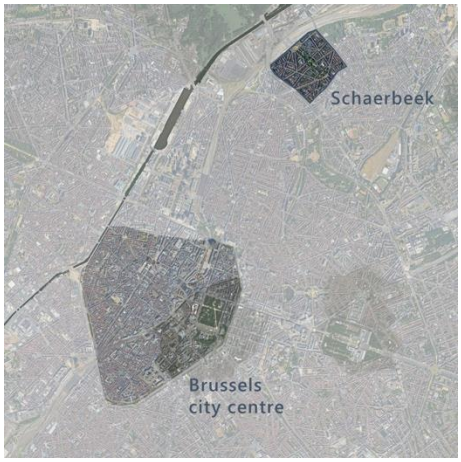

Figure 9 Boundaries of the area of Schaerbeek with comparison to the city centre.

2.1.2.2 Identification of problems

The Brussels Looper Living Lab is located in the municipality of Schaerbeek in the north of the Brussels Capital Region. This municipality has many issues regarding mobility and is therefore an interesting testing ground for the Looper co-creation methodology. VUB-MOBI has partnered with citizen NGO BRAL to identify and address issues of concern in the Helmet district in Schaerbeek.

The problem identification phase began in February 2018 with a blank page, i.e. open to all sorts of suggestions in terms of problems experienced by the citizens. The process started with a public meeting and ended with a data collection campaign in September 2018. During two meetings in the spring of 2018, citizens identified traffic safety as an urgent problem in the neighbourhood. Input from these meetings was supplemented with input from encounters with citizens at local markets.

Once traffic safety became the topic of the Living Lab, the discussion continued to which data should be collected to prove there is a problem with traffic safety in the area. A third citizen meeting was organised the find out what exactly citizens wanted to measure about traffic safety. Three themes were identified: speed of cars, use of the road and public space, and car pressure.

A data collection campaign was set up by BRAL and VUB-MOBI to collect data on traffic safety. This campaign included a survey about the mobility preferences of residents, a geotagging application through which citizens could identify traffic safety hotspots, and pop-up field research to count traffic and measure the speed of cars. This data collection campaign was quite successful: the survey was completed by over 100 citizens, around 20 citizens attended in the pop-up field research, and ten people used the geotagging tool despite difficulties with registering and adding data.

The data collected during this stage of the Looper co-creation process was used to inform citizens and the municipality of the problems in the area, as well as a base from which solutions can be co-designed. The traffic count showed that small vehicles such as passenger cars and pedestrians account for most traffic in the area; large vehicles and cyclists are only a minority. During the speed measurement, one-third of all measured vehicles was driving over the speed limit of 30 km/h.

Although traffic safety was a very hot topic in Schaerbeek, the Living Lab organisers encountered difficulties in setting up a Living Lab that was truly carried by local citizens. One of the explanations of this could be that a few weeks before the Brussels Living Lab kicked off, a traffic

safety initiative called 1030/0 was founded by Schaerbeek citizens that were concerned about traffic safety. The participants of the Looper Living Lab overlapped with the citizens in 1030/0, and citizens seemed to prefer to deal with the topic in their own organisation rather than in the external Looper project. Moreover, citizens may also have been sceptical about Looper since the organisers could not guarantee that the efforts from citizens would result in concrete actions by the local government.

2.1.2.3 Co-design and evaluation of alternative solutions

The co-creation approach in the Brussels Looper Living Lab resulted in the submission via the online Looper platform of over forty ideas to improve traffic safety. During the first co-design workshop, citizens selected five ideas whose sustainability impacts and stakeholder support would be evaluated by the Living Lab coordinators. The following ideas were selected:

1. **Improve signalisation** at a dangerous intersection.
2. Indicate **alternative cycling routes** to avoid busy high street.
3. Set up an **awareness campaign** to inform road users of children in the streets.
4. **Reduce road width** using temporary installations.
5. **Speed meters** that visualise the speed of road users using smileys.

A multi-criteria analysis (MCA) was used to find out the impacts of the five co-designed ideas on the sustainability of the Helmet neighbourhood in which the Brussels Living Lab is located. Here, sustainability impacts include the environmental, economic, and social impacts of an idea. The analysis revealed that all of the five co-created ideas is expected to have an overall positive effect on the sustainability of the Helmet neighbourhood. As shown in Figure 10, the awareness campaign for children in the streets has the highest sustainability score, followed closely by the narrowing of roads using temporary installations. The alternative cycling routes have the lowest sustainability score.

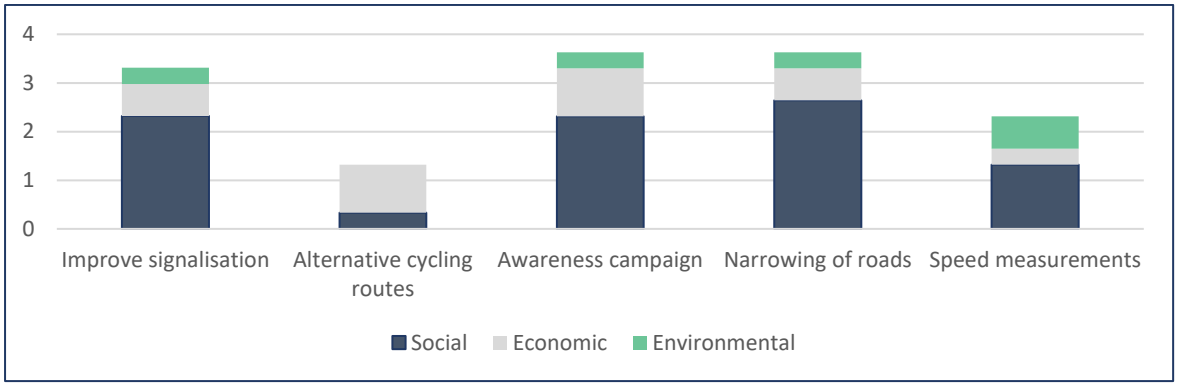

Figure 10 The sustainability impacts of the co-designed ideas in Brussels

Multi-actor multi-criteria analysis (MAMCA) was used to asses stakeholder preferences by evaluating the impact of ideas on criteria of stakeholders. For this we determined the main stakeholders – the municipality, a cycling association, citizens, the public transport operator, and the regional ministry of mobility – that would be involved in or affected by the interventions, identified their objectives and how important they find these objectives (weighting). For each co-designed idea, experts evaluated the impact on the stakeholders' criteria by using a seven-point scale from very positive to very negative. As shown in the image below, the two co-designed ideas with the highest evaluation scores in the Brussels Looper Living Lab were the improvement of

the signalisation at a dangerous intersection and an awareness campaign about the presence of children in the streets. Improving the signalisation at the dangerous intersection will have the most positive impact on the criteria of all stakeholders. It is therefore expected that the implementation of this alternative will gain the most support from stakeholders.

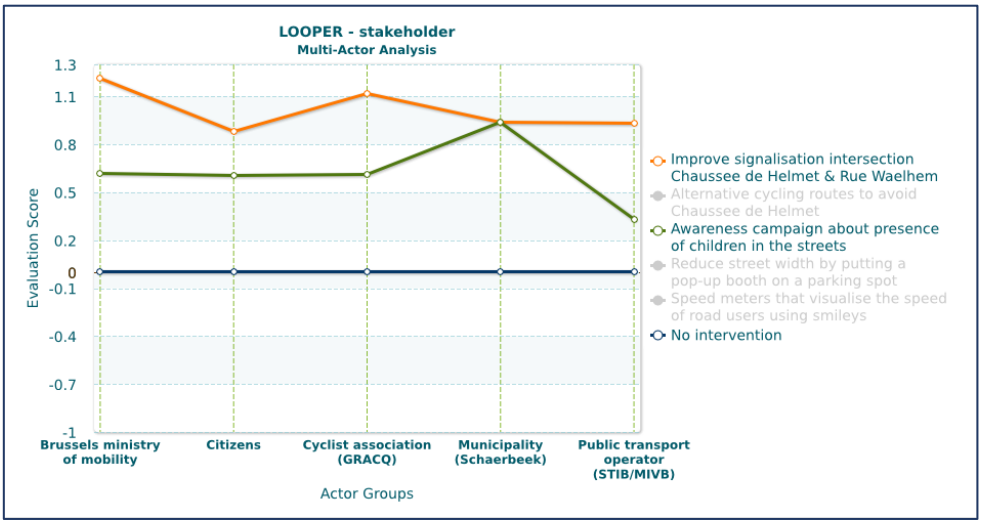

Figure 11 The co-designed solutions with the highest evaluation scores versus the 'no intervention' scenario

During the second co-design workshop, citizens decided to implement the two alternatives with the highest expected stakeholder support. However, the feasibility of the implementation of the idea with the highest evaluation score – the redesign of the intersection – within the timeframe of the Looper project was found to be low as it needs to go through an administrative process for approval. Nevertheless, the municipality stated to look into executing this alternative. This is not the case for the idea with the second highest evaluation score, the awareness campaign, which was implemented in June 2019.

The stakeholders that were involved in the Brussels Looper Living Lab during the co-design and evaluation phase were generally interested in involving the public in finding solutions to urban problems and were curious about the project. Sustained involvement of citizens remains an issue within the Lab, however. The co-design process gave citizens the possibility to suggest solutions to urban problems, whereas the evaluation process provided insights on the sustainability impacts of these ideas and the expected stakeholder support.

2.1.2.4 Implementation and monitoring of co-designed alternatives

The idea implemented in the final phase of the first loop was the awareness campaign about the presence of children in the streets in the form of a mandala created at an intersection. This idea was chosen by citizens because it was relatively easy to implement. In practice, this involved the designing and colouring of a large mandala at the intersection in front of La Gerbe AMO. The mandala was roughly 25 square meters and created by local artists and coloured in using chalk by residents. The creation of the mandala was done during La Gerbe AMO's annual street party on June 22; the road was closed off and a multitude of events were organized for locals. The Looper project oversaw the creation of the mandala alongside other planned activities to draw the attention of residents.

Figure 12 *Implementation of a co-designed idea in Brussels*

Alongside the physical implementation of the mandala, the police set up a speed measurement device on the street to monitor speeds from 17-27 June 2019. This allowed the Living Lab coordinators to analyse before and after speed measurements to deduce if any change was made to the speed of vehicles travelling on the road after having seen the mandala.

A total of 29 480 vehicles were recorded on one axis of the intersection. The analysis looked at those travelling towards Rue du Tilleul (24 418 vehicles) – as these vehicles speeds where taken after having passed the location of the mandala. Of these vehicles during the whole monitoring period, 75% travelled over the speed limit (>30km/h), with 48% at speeds at which they could be fined (>36km/h). There was a small drop in excessive speed (>36km/h) after the implementation of the mandala when comparing data from before and after the implementation. This entails that there are still over three quarters drivers not respecting the speed limit. The highest speeds were recorded during the evening, between 0.00 and 06.00, however excessive speeds were recorded at all times of the day.

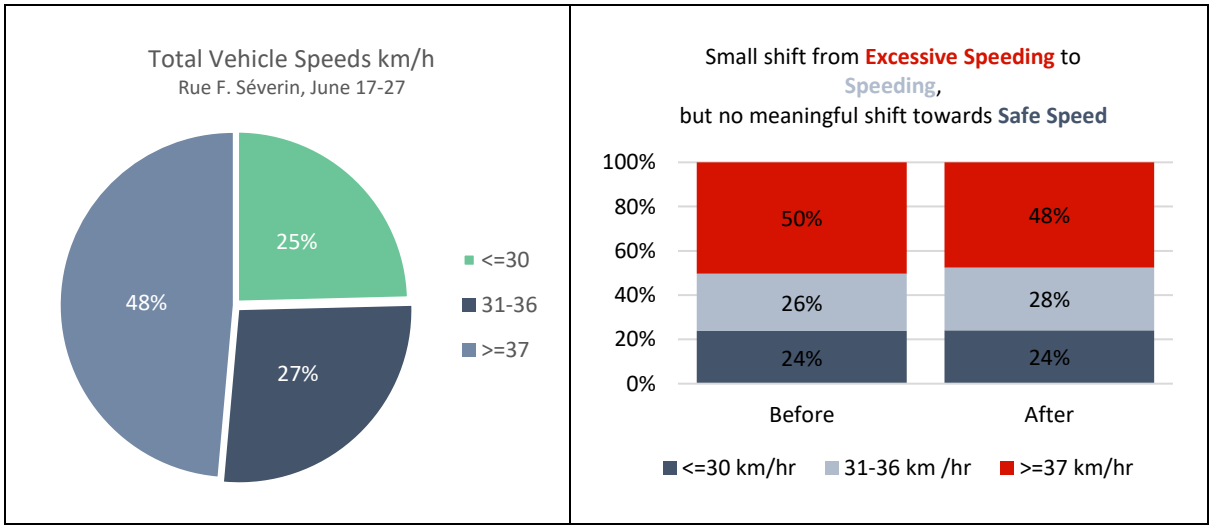

Figure *13 Results of monitoring effects co-designed solution Brussels*

As such, a mandala did not significantly affect traffic speeds, and speeds on rue Fernand Séverin were too high, further corroborating the findings of the initial speed measurements taken at other

locations. Concrete infrastructural changes are better suited to reduce speeds, as was raised by the police contact in charge of the speed measurements and what is found in the literature on traffic calming.Second Loop

2.1.2.5 Overview of the area

The Brussels living lab in Loop 2 focuses on the Dailly neighbourhood of the municipality of Schaerbeek (Dutch: Schaarbeek) in the Brussels Capital Region. After contacting different elementary schools via Schaerbeek municipality, the school *École No. 10* replied positively to our call and wished to work together with Looper to implement a school street.

Between 1998 and 2018, the total population in Dailly grew by 25.6% to 18,008. Almost 40% of the population in Dailly does not have the Belgian nationality, which is higher than the average in Brussels (34.6%) and in Helmet (28.9%), where the living lab was located in the first loop. Looking at both overall unemployment and youth unemployment (18-24-year olds), Dailly is above the Brussels average with an unemployment rate of 23.2%. With €17 411 in median income in tax declarations in 2013, it is below Schaerbeek and Brussels averages.

The family size in Dailly is on par with the Brussels average, and slightly lower than in Helmet. Rents in Dailly are lower than the Brussels and Helmet averages. Dailly is, based on the percentage of buildings built before 1961, an older neighbourhood than Helmet with notably taller buildings and a higher construction rate.

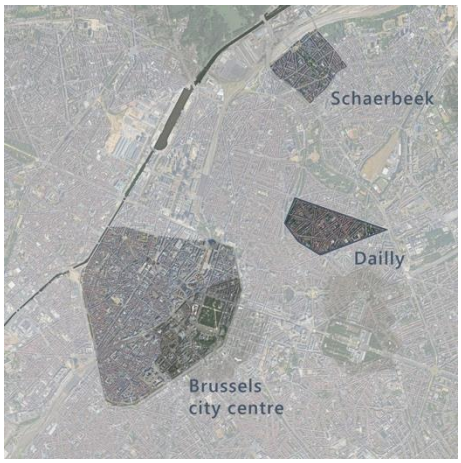

Figure 14 Boundaries of the area of Dailly with comparison to the city centre and Schaerbeek.

2.1.2.6 Identification of problems

The priority of the second loop in the Brussels Living Lab was selected after a discussion between the Living Lab coordinators and the Schaerbeek alderwoman of mobility. The experiences in the first loop – in particular the lack of engagement of residents with the project – led us to try another approach. In the second loop, we therefore tried to tackle an existing problem using the Looper methodology. Whereas the theme of both loops is the same – traffic safety – the application of the methodology is slightly different since we focused on problems that can occur when *implementing* a school street.

In Helmet, a part of the traffic safety concerns was located on the Helmetsesteenweg, where there were four elementary schools located. Many parents actively pushed for more street safety measures to ensure safety for the kids. While Dailly represents a new location with a new set of characteristics at play, it is also host to schools and areas with a high concentration of children.

There are three schools in Dailly: Ecole 10, De Kriek, and Lycée Emile Max. They are all located in the same area of the neighbourhood.

A **school street** (in French: *Rue Scolaire,* in Dutch: *Schoolstraat*) is a temporary closure of a street adjacent to a school entrance to minimize vehicular traffic during the pick-up and drop-off of pupils. This means during the morning before school starts and, in the afternoon, when school lets out the street is only accessible to pedestrians and cyclists. The street is blocked with barriers and a "do not enter" sign, which can be monitored by school staff, parents, residents, or neighbourhood agents. For those living on the street, or who may have parked their car there, exceptions can be granted. For example, any vehicle already on the street when the school street takes effect is allowed to exit the street – provided they drive slowly. For residents, exceptions can be granted to both enter and exit the street with a vehicle during the school street implementation timeframe and emergency services are always allowed access to the street.

2.1.2.7 Co-design and evaluation of alternative solutions

The co-design stage was on-going when the outbreak of COVID-19 caused the school and the school street to close. Before the closure, the living lab organisers had gone to the school and different days and hours to talk to as many parents about the school street. Any complaint, compliment or idea from parents (or residents that were passing by) was written down. The online platform was also active but has not been used by parents or residents, most likely because the co-design stage had not really been reached and/or actively promoted.

Criteria and weights from parents and residents were collected via surveys. The criteria and weights from other stakeholders (i.e. the regional ministry of mobility and the neighbouring school De Kriek) were collected using interviews.

2.1.2.8 Implementation and monitoring of co-designed alternatives

The stage of implementation and monitoring of co-designed alternatives was not yet reached when the outbreak of COVID-19 caused the school and the school street to close. Before the summer holidays of 2020, the living lab coordinators and the principal of the school reiterated their desire to the municipality to reinstall the school street after the summer holidays. In September 2020, the municipality decided to no longer support the school street because the construction of the new school building opposite to the current school would cause many trucks to drive through the street. Despite arguing that blocking the street for trucks for 30 minutes during drop-off would increase the safety of pupils and that during a pandemic it is important for parents and pupils to be able to keep distance, the municipality was not willing to support the reinstallation of the school street.

2.1.3 Key questions and issues

- ***Clear objectives or open questions?***

  The objective of the second loop was clear: the implementation of a school street. This made communicating the goal of the co-creation process much easier. In the first loop, there was no clear objective, which made it much more difficult to easily explain the purpose of the Looper project and the co-creation process.

- ***Online versus offline?***

  When setting up a living lab or a co-creation process, the organisers should investigate what type of participation is required: online, offline, or both. Combining both online and offline participation may result in more participation, but focusing on offline participation is an option, if the living lab organisers are inexperienced or uncomfortable using online

tools. Whether online or offline participation should be used depends on the goal of the living lab.

- ***Evaluation – technical versus social process?***

  Formal evaluation methods such as Cost-Benefit Analysis (CBA) and Multi Criteria Analysis (MCA) are often done in a top-down manner, without input from citizens. If urban and transport planners want to really embrace co-creation, the evaluation of the co-design ideas should also be done with the participation of citizens as well as other stakeholders. One method to do so is Multi Actor Multi Criteria Analysis (MAMCA), which has been tested in the Looper project. MAMCA shows how different stakeholder groups will be affected by the co-designed ideas using criteria and weights – a rather technical approach. However, MAMCA also gives the stakeholder groups a good view of their own position towards the co-designed ideas as well as the position of other stakeholder groups. These results can be used to reach a consensus between stakeholder groups on which idea(s) will be implemented and monitored. Learning about the positions of other stakeholder groups can facilitate the consensus-making, which is a social process. Executing a MAMCA does require quite some work from both living lab organisers as well as the stakeholder groups.

- ***Interventions – spontaneous versus planned?***

  The Looper co-creation process is divided into three stages: problem identification; co-design and evaluation of alternative solutions; and the implementation of these solutions. On paper, this allows for little spontaneity. However, we learned during our research that sometimes it is better to be flexible in order to proceed with the research.

- ***Involvement of decision makers***

  The decision maker power lies with policy makers. If the policy makers are not engaged in the project, they can disregard the outcome. If they are engaged, but do not like the outcome, they can also disregard it.

  While the Looper co-creation process tried to overcome power differences (e.g. using the MAMCA evaluation method to reach consensus on co-designed ideas), experiences in Brussels have shown that policy makers have the final say. In the first loop, the engagement of the municipality was rather limited, causing the co-designed ideas to be largely disregarded. The municipality was a strong supporter in the second loop but withdrew support before the project end.

2.2 Verona Living Lab

Hereafter is a short summary of the first and second loop from the Verona Looper Living Lab (LLL). A more detailed description can be found in deliverables 'D6.1 Verona Living Lab Implementation Plan including data collection plan and template for monitoring', 'D6.2b Report on the outcomes of the problem identification phase', 'D6.3b Report on the co-creation and evaluation outcomes ' and 'D6.4 Verona Living Lab evaluation report including learning outcomes and policy transfer'.

2.2.1 6-P Summary of the Verona Looper Living Lab

	OUTLINE
PEOPLE	A diverse and heterogeneous group of stakeholders
PLACE	A wide area south of the city centre of Verona
PRIORITIES	Air quality, noise, greening
POLICIES	Masterplan for new sustainable mobility still not implemented due to budget reasons
PLATFORM	Online and offline methods were used in the LLL
PROCESS	Lab was set up with the support of Comune di Verona and an ONG (Legambiente). Existing citizens' associations were involved and active throughout the whole process

Table 2 6-P Summary of the Verona Looper Living Lab

2.2.2 Overview of the area

The Verona Looper Living Lab is located in the South area of the city (Figure 15 and Figure *16*). The area is comprised between the former freight yard (North), the A4 highway (South), the A22 highway (West) and Via Palazzina (East). The Verona Sud area started to develop at the end of the XIX century, and in the late '40s the Z.A.I. (Industrial Agricultural Zone) was established. Right before the establishment of the Z.A.I. the Exhibit (Verona Fiere) was opened.

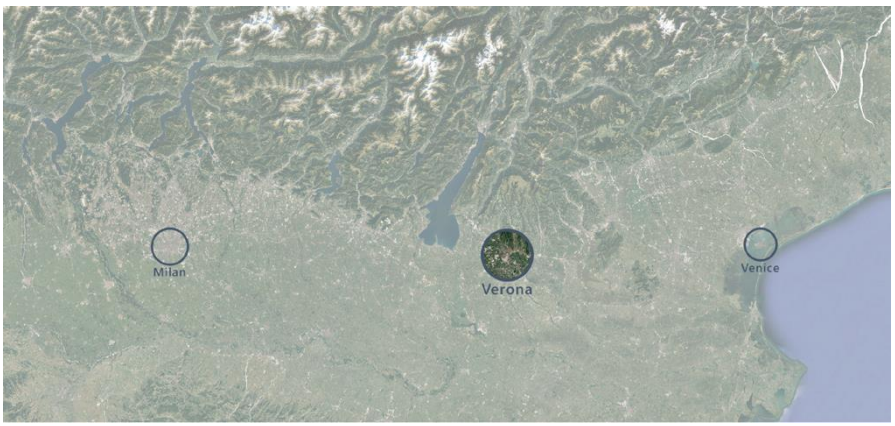

Figure 15 Location of Verona with comparison to Venice (East) and Milan (West).

Figure 16 *Boundaries of the area of Verona Sud with comparison to the city centre.*

The Verona LLL explores four interconnected issues: air quality, noise pollution, traffic and urban greenspaces. The Università Iuav di Venezia is the LLL coordinator with Legambiente (an NGO active in environmental related issues). The other main partner of the Verona LLL is the Comune di Verona, this meant that the City Council was an active member of the project since the beginning.

2.2.3 First loop

2.2.3.1 Identification of problems

The first phase of the Verona LLL engaged with residents to identify problems in the public realm (Figure 17).

Figure 17 Scoping of issues activity done with a printed map.

The priority since the beginning was to focus on air quality related issues, traffic and lack of greenspaces. To monitor these issues the Verona LLL used the following sensors: mobile units by ARPAV (Environmental Prevention and Protection Agency of the Veneto Region) to collect data about PM2.5, PM10, NO_x, NO, NO_2, O_3 (Figure 18); passive sensors for NO_2 (Figure 18); Air Monitor to collect NO_2 with participatory sensing (Figure 19); AirBeam to collect PM2.5 with participatory sensing (Figure 19); Luftdaten to collect PM2.5 and PM10 with participatory sensing (Figure 20); Noise Boxes to collect dB(A) data with participatory sensing (Figure 20); geotagging tool to collect qualitative data (Figure *21*). Some of the low-cost sensors - i.e. Luftdaten and noise boxes - were

self-made by the Verona LLL, others had been bought as already made - i.e. passive sensors, Air Monitor, AirBeam.

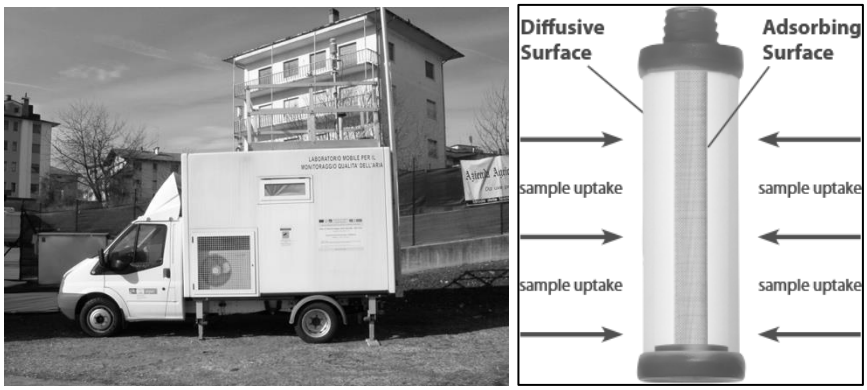

Figure 18 Mobile station by the official body (left), and schema of the functioning of a passive sensor (right).

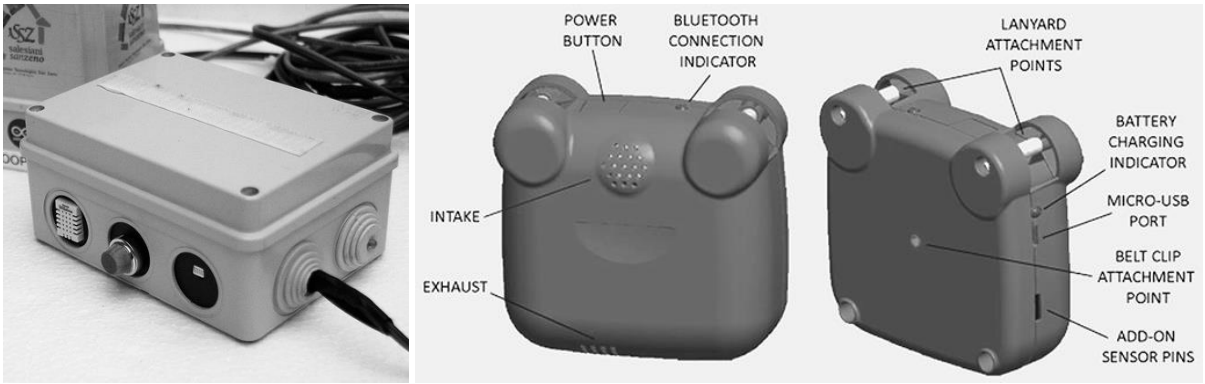

Figure 19 Air Monitor with its waterproof case (left), and schema of an AirBeam (right).

Figure 20 Components from a Luftdaten sensor (left, and a noise box with its waterproof case (right).

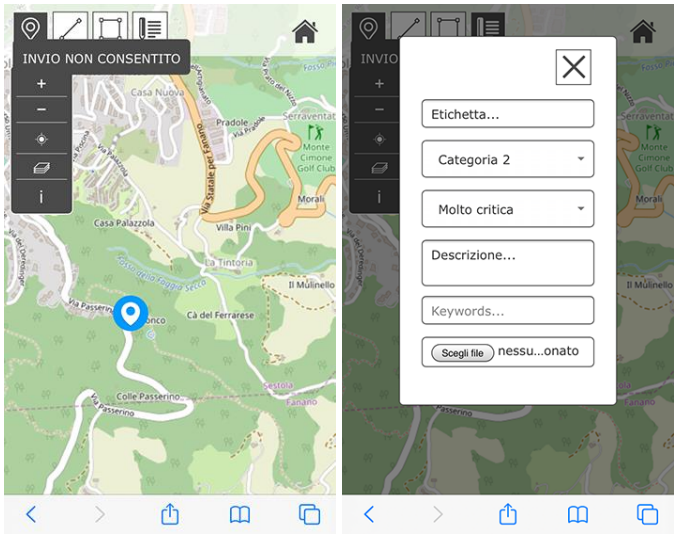

Figure 21 *Interface example from the geotagging tool.*

Participants were very engaged during the data collection phase. They were able to decide where to position the mobile units by the Environmental Prevention and Protection Agency of the Veneto Region, always considering what was needed to allow the correct functioning of the mobile units. This was something of extreme innovation and importance, since usually is the official body that chooses were to position their mobile stations. Participants also had enough technological skills to be able to use different digital tools for the participatory data collection, but they also had the chance to use an offline qualitative data collection e.g. comments drawn on printed maps during LLL meetings that were later uploaded online by organisers.

2.2.3.2 Co-design and evaluation of possible solutions

The co-design activity was based on knowledge given by the previous stage of scoping, data collection and data visualisation. With the data visualisation it was possible to consider if the data collected confirmed - or not - the issues in the project area.

Three co-design offline workshops were organised (Figure *22*), and during the workshop's areas were the co-design confirmed criticalities were analysed to find possible implementations to mitigate pollutants. The ideas were also proposed through an online tool.

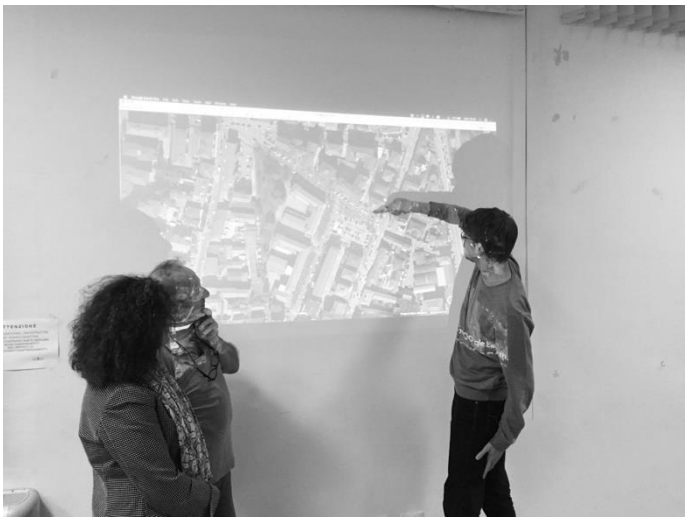

Figure 22 *Co-design activity with participants discussing about possible monitoring solutions using a projected map.*

Out of the 38 proposed ideas - both offline and online - (Figure 23 and Figure 24), and after a first feasibility analysis, 14 were selected (Figure 25 and Table 3) by all stakeholders to be evaluated with the MAMCA tool, and 3 were actually chosen to be implemented.

2.2.3.3 Implementation and monitoring

The 3 proposed solutions chosen after the evaluation – considered to be feasible from all stakeholders groups – were: street closure to create aggregation spaces in the project area; crosswalk island to make a safer crossing for children; create a 30 km/h zone with closing of the street during entering and exiting hours to stop traffic and create a safer space

Figure 23 Example of the online list of proposed ideas

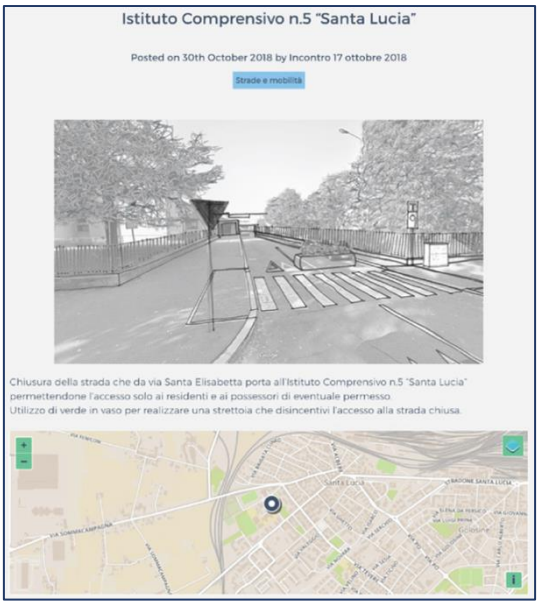

Figure 24 Example of an online proposed idea

Figure 25 Location of the fourteen selected ideas

PROPOSAL	LOCATION	WHAT	ALTERNATIVE
1	Via Scopoli	As via Scopoli is a quite wide street, and as drivers here speed up making it unsafe for pedestrians and cyclist, citizens here ask to create a 30km/h zone with urban elements to oblige drivers to slow down to make the street safer.	**30 km/h zone**
2	Via Scopoli	Implement the number of trees in the parking area in via Scopoli.	**Trees implementation**
3	Via Scopoli	Transform in a public greenspace the small green area that can be found at the crossing between via Scopoli and Viale Fiera.	**Greenspaces**
4	Via Ottavio Caccia	Close via Ottavio Caccia from the via Golosine side in order to create a safe pedestrian area where citizens can aggregate. The street will remain suitable for residents vehicles only.	**Street closure**
5	Via Santa Elisabetta	Via Santa Elisabetta is already a 30km/h zone. The proposal is to paint the street's asphalt in order to make more visible the already existing limit.	**Painting the streets**
6	Via Monsignor Bellomi	Closing of the dead end road to allow a more safe entrance/exit from the schools for children. Residents will still be allowed to pass by with vehicles at reduced speed.	**Street closure**
7	Via Colonnello Fasoli	Implementation of crosswalk islands outside the school with some urban furniture to slower passing cars and allowing children to have a safer crossing outside the school.	**Islands for crosswalks**
8	Via Vigasio	Implementation of crosswalk islands to avoid dangerous overtaking and speeding as via Vigasio is a quite large and long straight road.	**Islands for crosswalks**
9	Via Udine/Via Redipuglia	Implementation of the cycle lanes, where missing, in order to create a complete and continuous path for cyclists.	**Cycle lanes**
10	Via Udine	Closure of via Udine at entrance/exit hours of schools. An extra would be to make via Udine a 30km/h zone.	**Street closure**
11	Via Redipuglia	Implement the existing trees to create a more concrete barrier between the street and the school courtyard.	**Trees implementation**
12	Highway	Realise a complete green barrier on both sides of the A4 highway in the part which cuts through the area of South Verona.	**Green barriers**
13	South Verona	Street closures in different parts of South Verona on weekend days to create aggregation spaces, which are missing and wanted by citizens. This could be implemented in the framework of the Mobility Days promoted also with the Mobility Week by EU.	**Street closure**
14	Former freight yard	Persuade logistic businesses in moving their activity to the area called Quadrante Europa, realised by the Municipality for this purpose. This would help to alleviate the heavy traffic that clogs the area nowadays.	**Business relocation**

Table 3 List and description of the fourteen selected ideas

The street closure, to create aggregation spaces, was not implemented in the proper way and it resulted in some misunderstanding between citizens and policymakers. In fact, this idea was implemented during only one day that concurred with a mobility day organised by the municipality, and because of it the implementation done by Looper was wrongly interpreted. The public did not understand that the event was from the Looper project, and later criticised the

Mobility Day event for it. This criticism was because they said that a single street closure, with no linked activities, in that area for such a big event would not bring any benefits. Nevertheless, the idea was found to be still appreciated by participants since it was considered again for the second loop, to allow a better planning based on the mistakes done during the first loop.

The crosswalk island was implemented in a temporary way (Figure 26) to monitor if the positioning was feasible and useful for users, this to allow the best final implementation after the trial. It was found that the initial positioning was not correct, and it was decided to improve its positioning during the second loop to make it permanent. The technical issue linked to the crosswalk positioning was mainly linked to the close-by school bus stop. The new positioning of the bus stop did not have a safe space for children to wait for the bus, and because of this it was asked to improve the final positioning of the crosswalk island.

Figure 26 Temporary crosswalk island implemented in front of a Primary School.

The 30 km/h zone was unfortunately not implemented due to issues linked to the need of having someone controlling during closure times i.e. there were not enough resources to have someone (e.g. volunteers, policemen, etc.) fixed in the street to control vehicles speed.

2.2.4 Second Loop

2.2.4.1 Identification of problems

The 'Identification of problems' stage did not took place for the second loop in Verona because, as planned, the LLL worked on the same area of the first loop and citizens decided to continue on working with problems identified during the first loop.

2.2.4.2 Co-design and evaluation of alternative solutions

Following the results of the first loop, citizens decided to focus on longer term – and larger scale – solutions. The 30 km/h solution was abandoned, but the street closure and crosswalk island were kept to be further implemented during the second loop.

Thanks to the knowledge gained with the implementation of the temporary crosswalk island from the first loop, the further development done during the second loop was a moment of great self-evaluation for the Verona LLL. Participants were able to openly discuss were to position it during

the second loop, and why it did not work during the first loop. This then resulted in a re-position of the crosswalk island in its temporary feature, to be transformed into a permanent one after the end of the project.

The street closure implementation was once again chosen for implementation but, due to the issues raised during the first loop, more time was taken to design its implementation for the second loop. The main question raised for its implementation was about which streets to close to traffic - since there were several that could be of interest for closure - and which activities to have during the closure. The need to have activities organised during the street closure was due to citizens involvement. Participants involved in the Verona LLL evaluated that to involve other residents in the streets closure - this to create aggregation spaces - there was the need to give others something to do in the closed streets. Due to the Codiv-19 outbreak it was not possible to implement street closures with events, but the Comune di Verona accepted to integrate such idea within their agenda. The goal will be to keep a participatory approach by organising such events thanks to a collaboration between citizens – who will find activities that can be proposed and that will disseminate to raise participation – and policymakers – who will take care of the practicalities needed to close some streets and to make permissions for events.

The monitoring results from the first loop showed to the Verona LLL that air quality does not change if citizens only focus on their neighbourhood rather than on a larger geographical scale. Therefore, thanks to the knowledge gained throughout the first loop, the other main idea to be followed during the second loop was that of implementing longer term – and larger scale – solutions.

2.2.4.3 Implementation and monitoring

Following this longer-term strategy, the main idea chosen to be followed with the second loop was that of expanding the existing Santa Teresa park (Figure 27 and Figure 28). The existing Santa Teresa park is located in the northern part of Verona Sud and has three other possible development plots on the other side of the street. The co-design activity done by the Verona LLL for this idea was about proposing the extension and deciding the design of the new area of the park - i.e. deciding where to position urban forests, type of trees and bushes to be used (Figure 29), how large it needs to be and if some playground spaces are wanted.

Figure 27 Proposal for the future urban forests implementation in Parco Santa Teresa (option A)

Figure 28 Proposal for the future urban forests implementation in Parco Santa Teresa (option B)

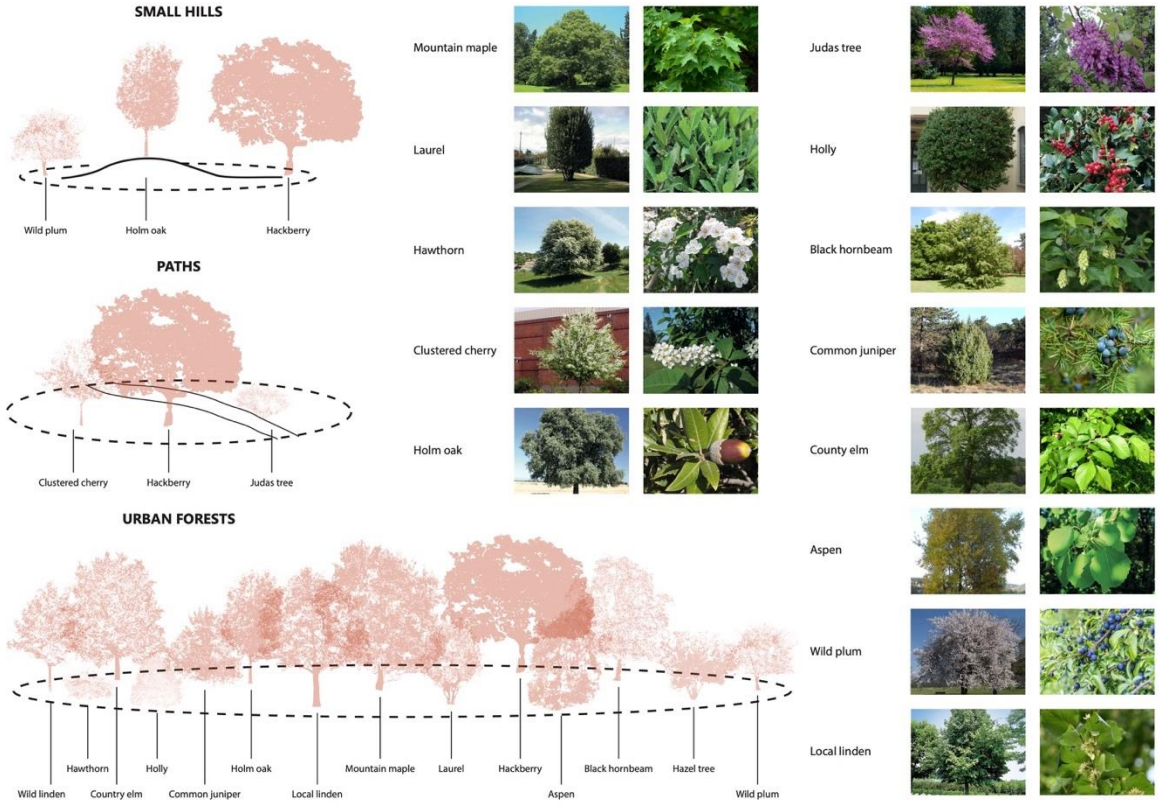

Figure 29 Possible trees and bushes to be used in urban forests

The Comune di Verona endorsed the Looper proposal of park expansion and decided to accept the design options that the LLL proposed.

Moreover, another long-term solution that will keep going after the end of the Looper project is the one concerning a possible dialogue with Autostrade per l'Italia to reduce the impact of the A4 highway that crosses the area of Verona Sud.

In conclusion, it is possible to see how participants, thanks to the knowledge gained during the first loop, decided that they wanted to improve more spread solutions – e.g. better planned street closures – to improve citizens' behaviours and to have longer term solutions since they learned that short term ones do not improve air quality.

2.2.5 Key questions and issues

Generally, the Verona Looper Living Lab experience was positive, but it raised similar questions as the Manchester one:

- ***Clear objectives or open questions?*** The Verona Looper Living Lab showed how focusing on issues of interest of citizens is the best way to have the higher rate of engagement. One tip if working on a large area e.g. a neighbourhood instead of a street, might be to focus on stakeholders that are effectively and directly interested in the topic instead of trying to involve everyone. This is due to both the impossibility of contacting all users – given the enormous amount – and to the higher chances of having people not interested in the addressed topic - that would not bring benefits to the LLL. That is why an initial analysis on the socio-cultural context before the beginning of the process is necessary.

- ***Online versus offline?*** The Verona Looper Living Lab saw how it is best to use both offline and online tools to allow a more inclusive process. The usage of offline tools allows a more direct knowledge sharing, and a more open discussion between stakeholders. Furthermore, the usage of online tools allows both a wider participation for those who cannot participate to offline meetings, and the visualisation/comprehension of phenomena measured with sensors that would otherwise being difficult to comprehend and communicate.
- ***Physical change versus social-economic change?*** Improvements to the built environment are considered to be important, but this is just one aspect. Participants during the process learned how a change in their behaviour is as important as physical changes of the environment. Furthermore, behavioural changes can then contribute in improving procedures of actuation of physical processes – influenced by the citizens and policymaker's relationship.
- ***Evaluation – technical versus social process?*** From the Verona Looper Living Lab experience, considering its wider area of project compared to Brussels and Manchester, it was possible to see how the MAMCA evaluation needed some adjustments to be feasible for the LLL needs. Participants were more willing to evaluate during offline meetings, since every stakeholders' group was there, rather than answering to fixed questions.
- ***Interventions – spontaneous versus planned?*** In the Verona Looper Living Lab it was possible to see how some of the asked interventions were already in the City Council agenda without citizens to know it i.e. crosswalk islands. This showed how an open and inclusive dialogue can help overtake some of the misunderstandings that are common between certain stakeholders' groups. What is important is that inputs given by LLLs can contribute in improving the design of interventions already programmed by the City Council, this to allow better final results and a wider approval by stakeholders.

2.3 Manchester Living Lab

2.3.1 6-P Summary of the Manchester Looper Living Lab

	OUTLINE
PEOPLE	Multi-cultural mix, with many long-term local residents, various minority groups, some gentrification. Strong local associations
PLACE	Deprived area close to city centre. High levels of traffic congestion, pollution and noise.
PRIORITIES	(urban environment): Traffic safety, greening, anti-social behaviour: (socio-economic) – welfare system stress, declining services, social change & gentrification
POLICIES	Large regeneration program with much disruption. Local Council has zero spare budget.
PLATFORM	Offline methods were found to be more suitable for most residents
PROCESS	Lab was set up with the benefit of working with existing agency S4B on the ground. However, some residents were in conflict with this.

Table 4 6-P summary of the Manchester Looper Living Lab

2.3.2 Overview of the area

The Looper Manchester study area is in the Brunswick neighbourhood (Ardwick ward) on the southern edge of Manchester city centre, and adjacent to the University of Manchester (UoM) campus. Brunswick is a former social housing estate with around 4000 people, previously owned and managed by Manchester City Council (MCC). It is now nearly at the end of a large regeneration program under a Private Finance Initiative (PFI) led by the consortium agency Solutions for Brunswick (S4B). The neighbourhood has a diverse population with high levels of deprivation, and is bordered by major roads on three sides, with high levels of noise and pollution. There are strong community networks and local organizations, but these are divided into different areas and socio-cultural groups.

The Manchester Living Lab explored five interconnected issues: air quality, traffic safety, security, community spaces and greening. The University of Manchester is the coordinator of the Living Lab here but works in cooperation with the social housing organisation S4B, along with the University-Ardwick Partnership.

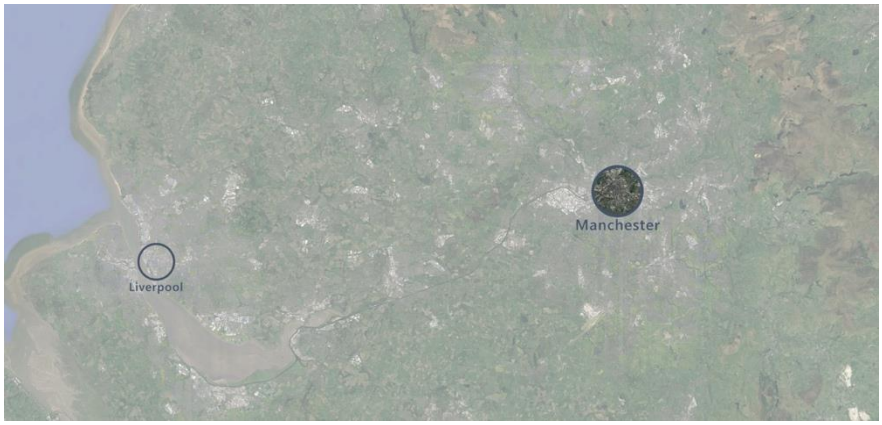

Figure 30 Location of Manchester with comparison to Liverpool.

Figure 31 Boundaries of the area of Brunswick with comparison to the city centre.

2.3.3 First loop

2.3.3.1 Identification of problems

The first phase of the Looper Manchester engaged with residents to identify problems in the public realm. Clear priorities emerged in relation to air quality, traffic volume and safety, greening the neighbourhood and improving community spaces. We then collected data with residents on air quality using mobile Airbeam sensors, and data from the fixed government air quality sensing station. Primary data was also collected on existing green infrastructure in target intervention areas using observation and GIS mapping. Resident preferences and notes on the local area were collected using the online geotagging application and, where residents were either unable or unwilling to use the app, through offline consultation using maps and photos that were then uploaded to the online platform.

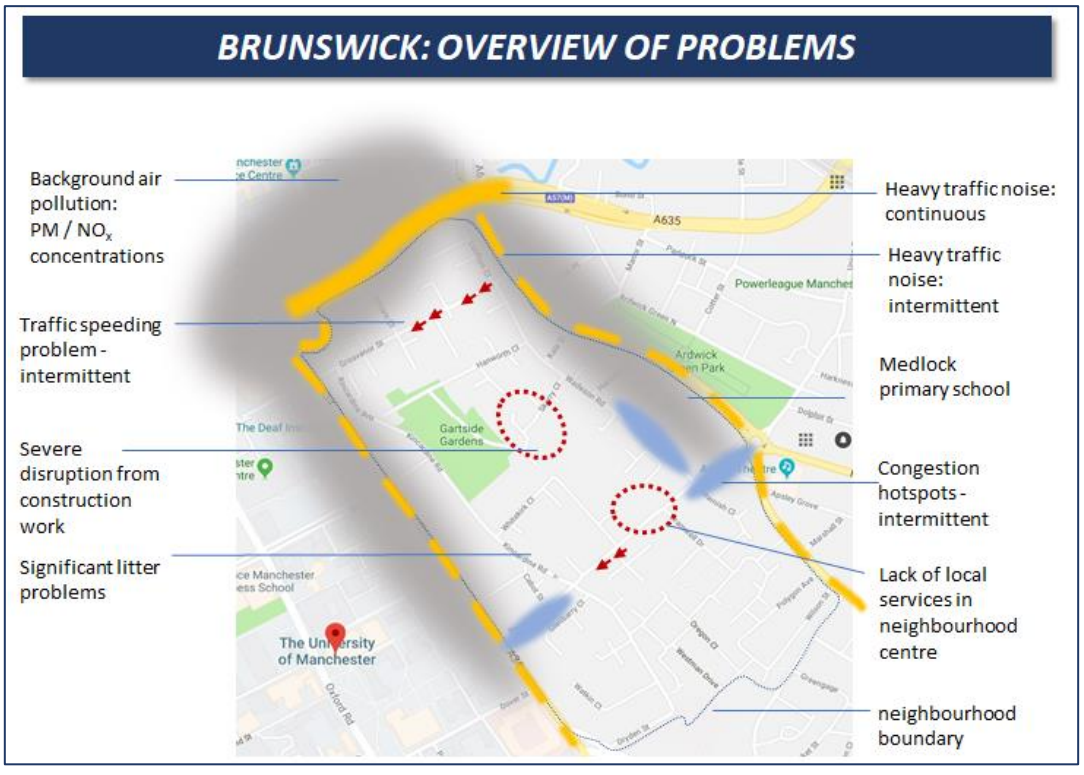

Figure 32 Brunswick: overview of problems

2.3.3.2 Co-design and evaluation of alternative solutions

The co-design activities were able to build on what we had learned during the problem identification phase. In particular, we tried to (a) integrate our co-creation process with existing activities; (b) not depend too much on online participation; and (c) make the most of compelling visual representations. We organised three co-design workshops with different community groups as well as an interactive stall at a community fair. In parallel we encouraged residents to map and describe their ideas for Brunswick on our online Ideas page or on a paper version of this that we distributed in the community. These activities resulted in 13 proposed solutions to the problems identified in Brunswick. These proposals were carried forward for evaluation by key stakeholders (including residents).

Figure 33 Brunswick: overview of solutions

We aimed to use the full Multi-Actor Multi-Criteria Analysis (MAMCA) toolkit, but the process seemed too technical for the stakeholders. Instead, we took a MAMCA inspired approach, centred on a workshop with 28 participants, who selected an array of interventions. The priority was the neighbourhood high street, (a) reducing the speed and volume of traffic on this busy street; (b) making it a nicer, greener place to be enjoyed by local residents; and (c) setting the tone for the rest of the neighbourhood and encouraging similar initiatives elsewhere.

2.3.3.3 Implementation and monitoring

The process combined an overview of the options, with a paper-based MCA evaluation, which then combined different levels of information: technical, spatial maps, visual thinking, text comments, as illustrated in Figure 34.

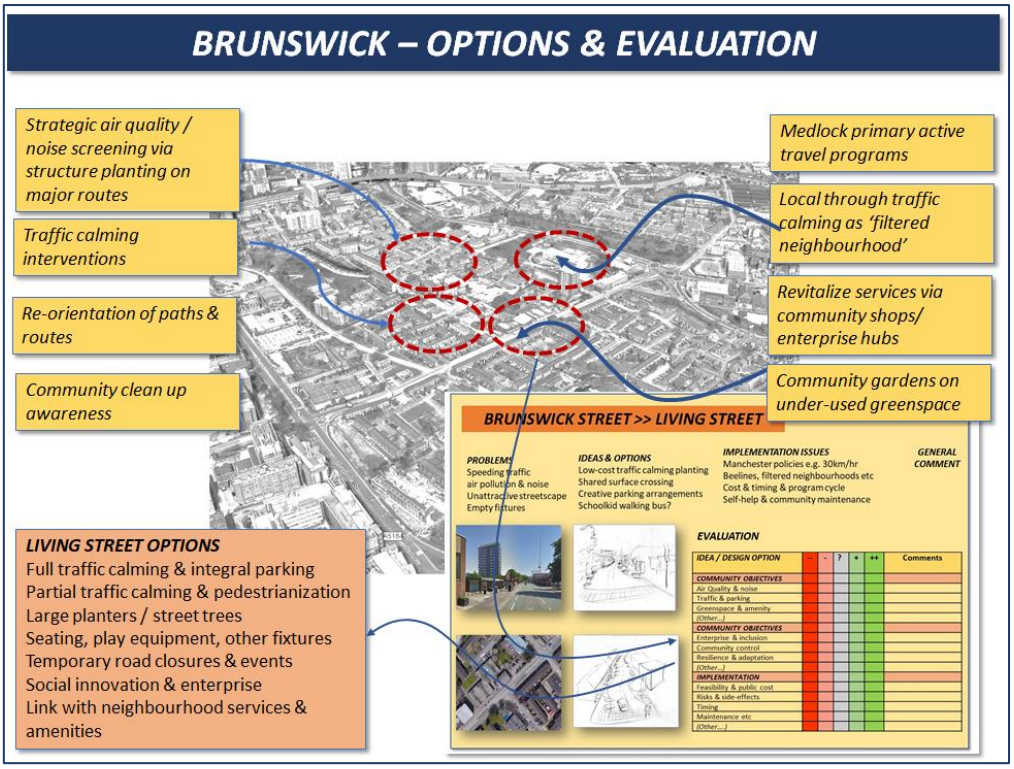

Figure 34 Brunswick – options and evaluation

The selected group of options were then detailed up into sketch design drawings, suitable for permissions and funding requests, along with further resident consultation.

Then came a long process of seeking regulatory approval for traffic calming, seeking funding or other resources, and changing the specification to suit the very small amount of public funding which came through. An effort for large planting boxes on the pavement was also challenging, resulting in 5 planters. There was also a subsidized 'green basket' scheme which was very popular, providing around 200 baskets with planting for residents to maintain.

At the same time, a set of real-time speed monitors were mounted on the lighting columns on Brunswick (funded by the Manchester Urban Observatory[2]), with data on 'before and after' the traffic calming signs went up. This coincided with a strategic 'Looper Lunch' with policymakers, where we began in-depth dialogue on the policy implications of the learning loop principles and practice so far.

[2] https://www.urbanobservatory.manchester.ac.uk/

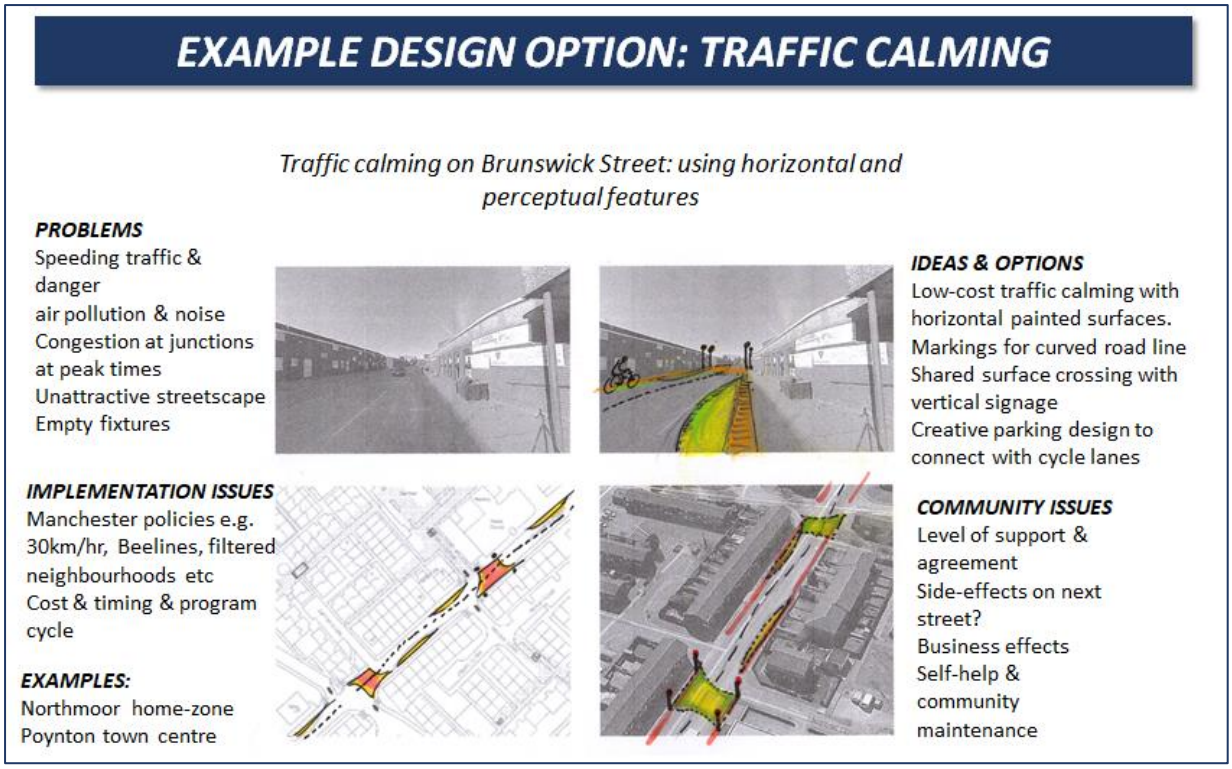

Figure 35 *Example design option: traffic calming*

2.3.4 Second loop

2.3.4.1 Identification of problems

Following these interventions, a series of interviews, public meetings and household surveys were carried out, on (a) public perceptions of the actions and results so far, and (b) priorities for the next stage. In parallel there were further studies from UoM masters students, on traffic data analysis and school transport. A final resident's workshop was planned to look at all the data and analysis so far and review a series of 'blue-sky' solutions to selected problem areas (e.g. the road crossing near the school: this had to be cancelled due to the Covid-19.

Also, a final strategy/research workshop is planned at the end of the project, to review the Looper Model and Toolkit, implications for policy development, and next steps for application.

2.3.4.2 Co-design and evaluation of alternative solutions

With the Covid-19 having shut down most normal channels of public participation, these 'alternative solutions' have been discussed more at the strategic level of the local City Council and its agencies (see also Section 4.4). Ongoing discussions have raised alternatives such as:

- New organizational collaboration such as 'Bringing Services Together' and 'Community Resilience Hubs'.
- New levels of systematic technical monitoring, provided by or through the Manchester Urban Observatory platform.
- New creative combinations such as the LINKS concept ('learning, information, knowledge, insight, strategy')

2.3.5 Key questions and issues

Generally, the experiences in the Manchester Living Lab were positive, but also raised many questions:

- ***Clear objectives or open questions?*** Looper Manchester showed ways to do 'deep engagement' and active outreach with residents, taking the Looper desk into the neighbourhood, making relations and dialogues over a period of time.
- ***Online versus offline?*** It was difficult to persuade the residents to engage with digital monitoring and data visualization. Their view was, generally, *"we pay the City Council experts to do this so why spend our valuable time to do the same thing?"* While there is much attention on 'smart' IOT monitoring, or digital co-design tools and platforms, Looper Manchester found off-line methods more suitable and useful for the residents of such deprived areas.
- ***Physical change versus social-economic change?*** Improvements to the built environment are important, but these may be just the surface level of social and economic problems. Improvements to these are generally more difficult to monitor or analyse, but more rewarding to bring into the loop.
- ***Evaluation – technical versus social process?*** For typical community problems, these are open questions and solution spaces (in contrast to a focused question, how to do transport from A to B). The most useful approach seems to be a combination of a technical tool (e.g. 'MAMCA') with practical hands-on social learning and deliberation.
- ***Interventions – spontaneous versus planned?*** A Living Lab might find opportunities outside/between municipal plans for creative community initiatives. Or, it would work closely with these plans, aiming to enhance them, and connect them to community ideas and initiatives. A third option would be to confront the authorities with problems such as air quality, which call for more radical solutions.

These issues are discussed further in the Section 5: Recommendations and next steps.

3 LOOPER TOOLKIT AND PLATFORM

3.1 Overview of Looper toolkit and platform

The Looper living lab worked with a range of possible interventions for practical problems in urban communities and uses different methods and tools during the co-creation process.

Environmental monitoring

- ***Air quality.*** *Mobile low-cost handheld devices, such as AirBeam and Luftdaten, are interesting to understand the general situation of air quality through participatory sensing. Nevertheless, we must be aware that their data collection method is not always precise. It is still better to cross-check these values with official data.*
- ***Noise monitoring.*** *Noise monitoring can be done by using a smartphone, the OpeNoise (or similar) app and a calibrated microphone. Always consider the need to further calibrate the device due to the background noise reduction software in smartphones.*
- ***Traffic monitoring.*** *Flows and speeds can be manually measured by citizens as well as with low cost, automatic devices such as Telraam. Fixed installations are more accurate but costly.*
- ***Other urban conditions*** *such as crime and security, greenspace, and urban pollution. Information can be collected with citizen photos or media clips, uploaded to the online platforms or using collaborative geotagging tools.*

Visualisation and analysis

- ***Spatial data dashboard.*** *It is crucial to show data collected with participatory sensing, but the visualisation dashboard needs to be as easy and user-friendly as possible, and with no need of registration. Where relevant, interesting data from external database should be uploaded.*
- ***Multi-criteria analysis.*** *Evaluation of the impacts of co-designed ideas on sustainability and stakeholders, when the different co-designed ideas are distinct, can be done using Multi-Criteria Analysis (MCA) and Multi-Actor Multi-Criteria Analysis (MAMCA)[3].*

Co-design and engagement

- ***Co-design tools and methods.*** *Different offline methods and online platforms for co-design are analysed in the Looper library of tools[4]. Based on our experience, these tools and methods can be integrated with use of large printed aerial views of the neighbourhood.*
- ***Co-design platform.*** *Online idea-generation tools provide the opportunity for citizens who would otherwise not attend workshops to propose solutions and discuss them online.*
- ***Community engagement.*** *One of the most successful approach is 'active outreach', where researchers are involved in local activities and networks, with an open door to all local problems and ideas.*

[3] www.mamca.be
[4] www.looperproject.eu/tools/

The Looper Toolkit comprises online and offline tools to support the learning loops. Such tools include monitoring kits for air or noise, tools for visualisation, evaluation and decision-making, as well as online or offline tools for citizens to explore ideas and designs.

The Looper platform is part of the Looper Toolkit as well. The platform puts together existing tools based on the initial analysis of the context. Using existing tools allows easier replications of the platform itself that can be adapted to different socio-cultural contexts. The platform schema and functionalities are described in D2.1.

3.2 Monitoring – Tools, Methods and Experience

Within the framework of the Looper project different tools were used, such as air pollution sensors, noise pollution sensors, traffic radar sensors, qualitative data collection. This document contains a summary about the tools used, while in deliverable 'D2.1 Report on data collection procedure framework' a more complete description is presented.

3.2.1 Air pollution sensors

- Official body's fixed and mobile stations for NOx, NO, NO2, PM2.5 and PM10 - used by the Verona LLLL. The fixed station by the official body was used as baseline for the data collected with other sensors, since it was not possible to change its position. Mobile sensors were positioned based on the needs of the LLL, and it was used to monitor some criticalities found during the scoping of issues. Mobile units, in the Looper framework, collected data for 30 days during the data collection, did another 30 days during the monitoring and were used for an extra 15 days of data collection for the second loop.
- Passive sensors for NO2 - used by the Verona LLL. This type of sensors is a low-cost stationary one used by the official body to have a wider idea of the level of NO2 in a certain area. Participants again were able to decide where to position them. Passive sensors need to stay in place for at least seven days to give a reliable data, and it is better to pair them to have a comparison within collected data. This sensor uses a diffusive surface to absorb NO2 particles, and later the membrane is analysed by a laboratory to have one single data for each passive sensor.
- GPS PM2.5 logger (AirBeam) - used by the Verona and Manchester LLL. This is a mobile type of sensor that works on a continuous base. Participants were engaged in its usage since it was necessary to walk around the project area to collect data with it. This sensor collects PM data by using the light scattering method.
- GPS PM2.5 and PM10 logger (Luftdaten) - used by the Verona LLL. This type of low-cost sensors is a stationary one. Participants from the Verona LLL decided to switch from the AirBeam to the Luftdaten during the monitoring activity because it was easier to have multiple stationary sensors, rather than going around the project area with mobile ones. Both sensors work with the light scattering method, meaning that the difference between the two is their mobile/stationary usage.

3.2.2 Noise pollution sensors

- Android sound level meter (Noise box) - used by the Verona LLL. This sensor is a low-cost one made by assembling an Android smartphone, a lavalier microphone and a waterproof case. The data collection is done by using an app developed by ARPA Piemonte (official body from the Piemonte region) that is able to calibrate a smartphone to collect data while disabling the software that reduces background noises. This is done because the pre-installed background noise reduction software alters noise data usually

collected with smartphones and tablets. This sensor needs to collect data in a stationary way for at least seven days to have a reliable representation of the noise condition.

3.2.3 Traffic radar sensors

- Black Cat Radar - used by the Manchester and Brussels LLL. This sensor collects data about: number of vehicles passing on a road; type of vehicle – e.g. bike, car, truck; vehicles' speed while passing close-by to the radar. This sensor works on a continuous basis and it is a stationary one. It can be supplied by solar panels or it can be plugged in to the municipal electricity supply.
- Telraam – used by the Brussels LLL. This low-cost sensor counts vehicles and registers their speed by capturing and analysing images. It has four categories: large vehicles, small vehicles, cyclists and pedestrians. This sensor needs to be mounted inside an upper-floor window with a view on the street. It uses a Wi-Fi connection to send the collected data to a central database every hour and to allow for the visualisation and analysis of such data on the Telraam website[5].

3.2.4 Qualitative data collection

- Geotagging web app - used by the Brussels, Verona and Manchester LLL. This web app was developed to have a user-friendly interface and it allows the collection of qualitative data with the possibility to locate them within the project area. This web app gives the option to locate using points, lines or defining area to allow a better description of the input that the participant is giving. This is meant to give more info that a traditional survey, and thanks to the ranking option it is possible to upload both good practices and not only criticalities.
- Online and face-to-face surveys - used by all LLL. These types of surveys were implemented during all the stages of the process and were also used to compare the before and after situation for the type of data that could not be expressed by quantitative data – e.g. linking of the starting situation or appreciation of the implementations.

All the tools, and more in general the monitoring, has been done in a participatory way. This meant that the usage and positioning of "official" was decided with participants, based on the needs that were raised during the scoping of issues activity.

With low-cost sensors, participants were actively engaged in the data collection, and this was done differently depending on the LLL. In Verona, participants used low-cost sensors by themselves, or allowed their positioning inside their houses, because they lacked the required technical skills. In Manchester, some participants were digitally illiterate, but organisers arranged some meetings to use low-cost sensors together with participants to help them. In Brussels, the living lab organisers helped citizens set up the Telraam devices.

3.3 Visualisation Dashboard

The aim of the Looper visualisation dashboard was to further enhance a co-creation process by visualising the data collected during the data collection campaign. Given the different socio-cultural context of the three living labs it was decided to make the dashboard as user-friendly as possible, with only few options for users to select.

[5] www.telraam.net

While designing the Looper visualisation dashboard, some decisions were made regarding the data model definition. Furthermore, other decisions were made relating to visualization and interaction, and concerning map layers structure, data processing, interactive tools and maps symbology.

In terms of map layers structure, the choices were two: (i) the separation of all data into simple layers by type of measured phenomenon (only one type of information for each map layer) (ii) the layers grouping by source. The separation of different sources helped in perceiving the difference in data accuracy implicitly related to the collecting methods, and it allowed to simplify the symbology as much as possible to reduce the cognitive effort endured by the user.

The separation of layers resulted in the differentiation between four groups of data: official (Figure 36); participatory sensing (Figure 37); participatory qualitative (Figure 38); public databases (Figure 39). By having different layers based on the type of data it was possible to better adapt the way of visualising to the kind of information that that type of data wanted to give. For official data and some of participatory sensing data - i.e. Luftdaten and noise boxes - it was possible to see data by clicking on the location pin and then by selecting the campaign period. Data were then shown as a list – e.g. bottom right side of Figure 36. For other participatory sensing data – i.e. AirBeam, participatory qualitative data and public database data it was possible to investigate the measurements and/or the comments by directly clicking on the pin/line/area since there was no need to select the campaign period.

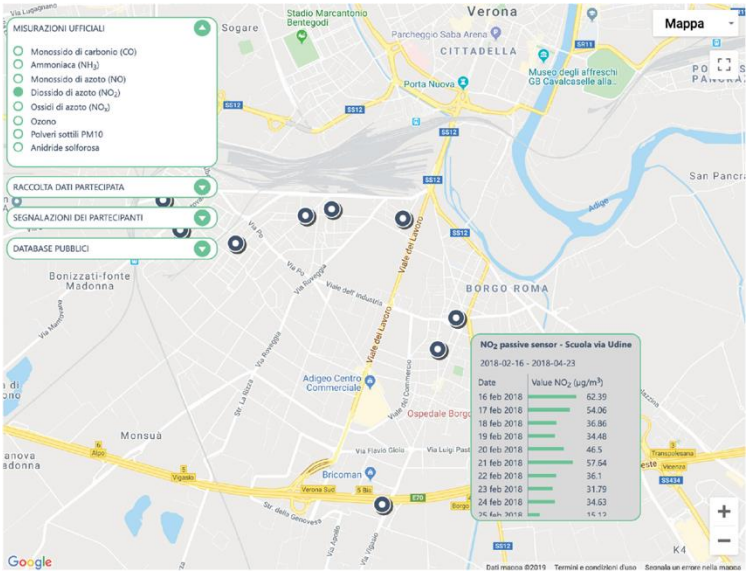

Figure 36 Example of official data visualisation

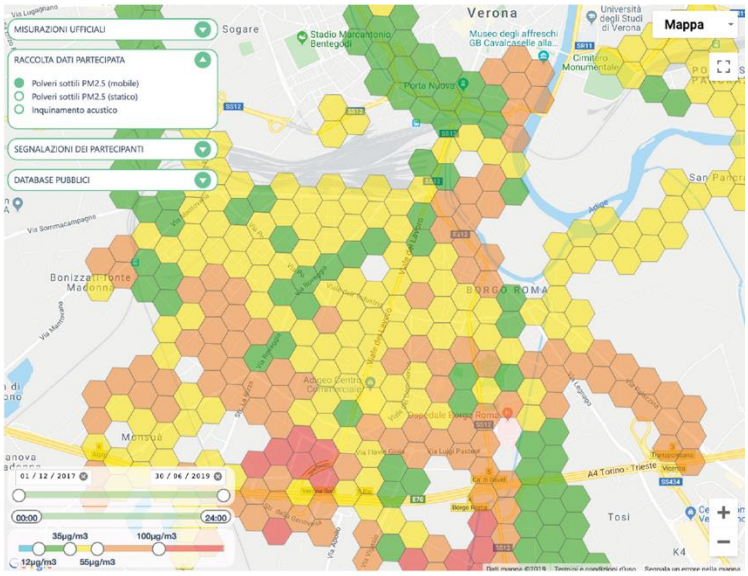

Figure 37 Example of participatory sensing data visualisation

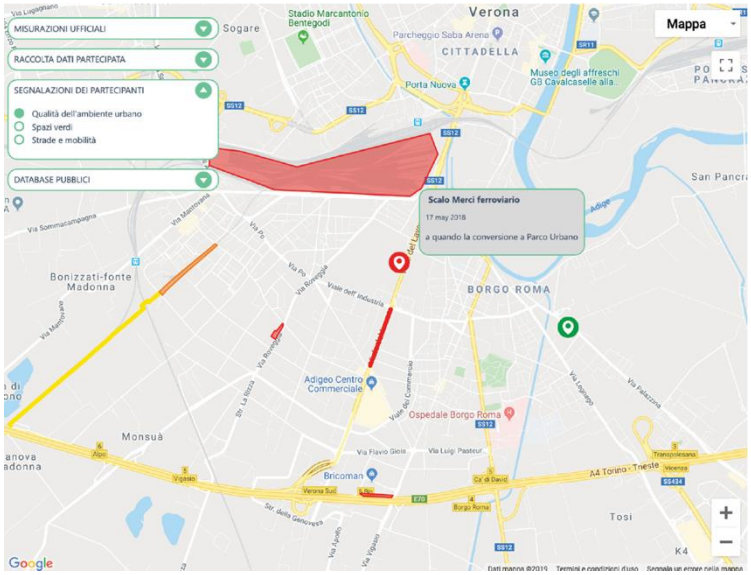

Figure 38 Example of participatory qualitative data visualisation

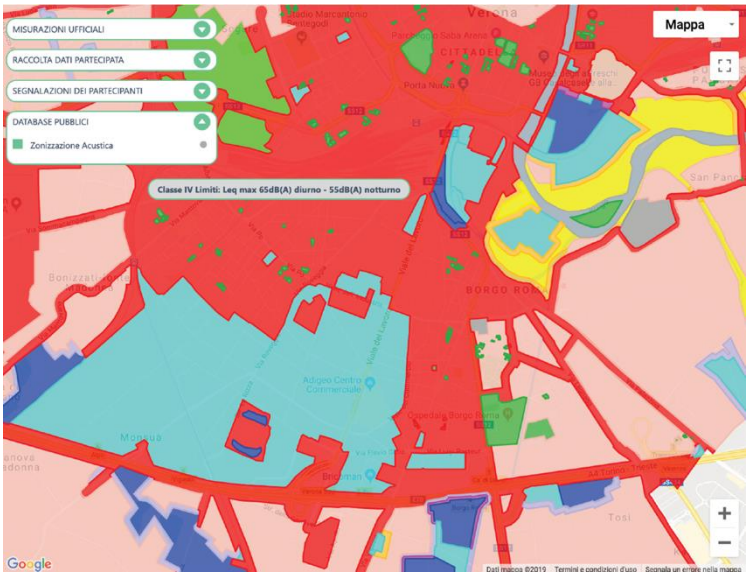

Figure 39 Example of public database visualisation

The choice not to process and integrate datasets, providing simple and direct - uninterpreted – layers, was intentionally aimed at increasing credibility of the source and trust in the end user-provider relationship. It also eases to apply quantitative symbols, which maximizes the effectiveness of visual communication of measured phenomena.

As regards to interaction, the goal was to “reduce the complexity of choice” in the perception of how to explore data and better understand map content. Furthermore, to reduce the usability gap between more and less digital skilled users, map based interaction was limited to the two basic actions: "click to get info" and "drag to pan", leaving out other typical functions such as "drag to select", "drag to zoom-in" etc.

In some cases, it was necessary to make some data pre-processing because of visual and technical ineffectiveness of displaying raw datasets. This is the case of all distributed monitoring campaigns - done with the AirBeam - resulting in millions of point data that had to be interpolated upon a fishnet layer (Figure 40) and styled using the colour carrier. In this particular case, a special tool - that can be seen in the bottom left part of Figure 40 - has been developed in order to enable users to customize styles in real time - mitigating the perception of viewing already interpreted data.

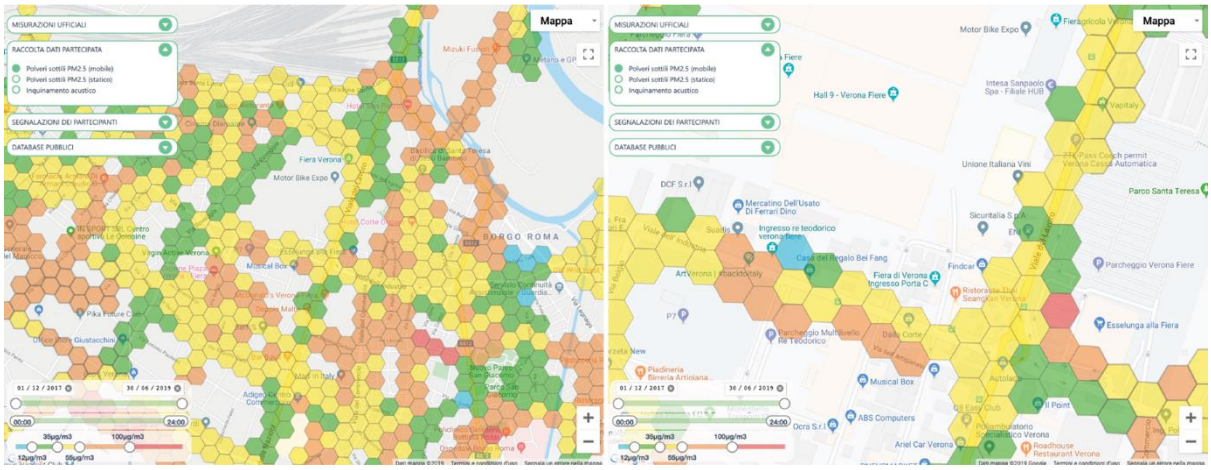

Figure 40 Example of adaptive zoom levels for the AirBeam data visualisation with the scroller in the bottom left side

3.4 Methods and tools for offline co-design: 'reaching the hard to reach'

This section starts with a quote from a resident of Brunswick: "*it's not us who are hard to reach, it's you researchers*". This demonstrates the potential divisions and differences of language, culture and expectations. Some residents don't like the idea of being inside an experiment designed by unknown experts, for the extraction of their knowledge (as they see it). In Manchester the Brunswick neighbourhood is across the road from the university, and there are many tensions around gentrification, access to jobs, and simple inequality.

In response, the key points and recommendations below have all helped in some way to make the Looper co-design process work, and to extend it to all parts of the community. This builds on a long history of community development and public participation in planning, with many methods and tools available, e.g. Wates 1991: Ravetz 1995: http://www.planningforreal.org.uk/

3.4.1.1 Deeper and wider engagement:

It seems crucial to find ways through the typical distrust and alienation of citizens from public authorities, especially for areas of high deprivation, minority social groups, ethnic or cultural groups, and particularly for young people (note – social research with people under 18 has ethical questions).

In Manchester the Looper made a special effort on the 'people' side, with focused outreach works, participation within community groups and initiatives, with an open mind and listening ear. This program also worked closely with the community liaison officer from the housing agency S4B.

In Verona, having the City Council participating to LLL meetings from the very beginning, this to allow citizens in better understanding the boundaries that the Administration have, helps in lowering the distrust that citizens typically have.

In Brussels, some community groups were contacted in the first loop but generally their engagement was not very successful because a lot of effort already went into engaging those who usually are not hard to reach. In the second loop, we changed strategies and opted to go to people instead of expecting them to come to us. We did this by talking to all the parents waiting to pick up their children from school.

3.4.1.2 Bridging the digital divide:

While there is much attention on 'smart' IOT monitoring, or digital co-design tools and platforms, Looper Manchester found off-line methods more suitable and useful for the residents of deprived areas. The following list shows many ways in which this can work.

If participants have even a little understanding about technologies and digital tools it is of extreme empowerment for the LLL to use both online and offline tools. This is of extreme importance it the project area is bigger than a neighbourhood because it allows a wider knowledge sharing.

In Brussels, the online platform served as a repository of ideas and as a way to keep track of developments. The online platform reflected what was discussed during offline meetings and workshops, so nobody was excluded from the co-creation process.

In Verona there was no big issue of digital divide, if people were not able to use the online co-design tool organisers were available to upload their ideas on the platform. The co-design tool was used as a repository for ideas proposed during face-to-face meetings to have a more inclusive set of co-designed ideas.

3.4.1.3 Informal spaces, arenas and forums:

Where there is ongoing activity by the community in open meeting places, the Living Lab should engage with and if possible, support it. For example, the Brunswick Street 'Well-being lunch' worked with volunteer labour, providing low-cost food, with an open door twice per week. It is easier to reach possible stakeholders if organisers go meet them in their usual meeting places.

In Brussels, the workshops in the first loop take place in local businesses and schools. There was thus an expectation the residents would come to use. In the second loop, we had a mobile living lab – a table with information about the project – that we installed in front of the school so we could reach as many parents as possible.

3.4.1.4 Community noticeboard and open-door sessions:

A wall or whiteboard in a local space is essential for those without full digital access or know-how. This should run alongside an open-door office session, i.e. where the researchers/organizers are on site and available at certain times each week. This may also work well in the most popular local venues, i.e. church halls, bars, schools, marketplaces, depending on what is available. The most important task here is that the researchers can be 'ethnographers', i.e. to listen, observe and respond as part of the community. This will show the structure of the community/communities, key people and organizations, key priorities or challenges, power structures or conflicts, and so on. The Living Lab cannot solve all such problems – see the section on 'Framing' above) – but with understanding of the context it can begin to contribute, and so make meaningful relationship.

3.4.1.5 Partnership organization:

An intermediary organization is very useful to make links and open dialogue between researchers, residents, local government or other agencies. In Manchester, the University Ardwick Partnership was formed to link the Tenants and Residents Association with the university, to coordinate various schemes (however this later had internal conflict.

In Brussels, the second loop was a partnership with the municipality of Schaerbeek and a primary school.

In Verona, researchers were seen as neutral organisers that could link different stakeholders, and that could level misunderstanding by using their knowledge. It is better for the process if organisers are not directly involved as stakeholders

3.4.1.6 Hands-on toolkits:

While there are many online platforms and digital apps for participation, experience shows hands-on tools are much more likely to generate positive energy and synergies between stakeholders. One good example is the well-known Ketso toolkit, developed in Manchester, and now used in Brunswick with positive effect (www.ketso.com): this is basically a mind-mapping tool with attractive physical pieces for use on a table. However, it is not mandatory to use an existing toolkit to have a positive experience. If it is not possible to invest money on a tool it is enough to use paper, pens and a post-it notes. In that case a clear structure and process is essential: these are typical stages, which may be best done in separate sessions, or combined where needed (one version of this available in Ravetz 2020, and on https://sites.manchester.ac.uk/synergistics/toolkit/):

- Priority & problem focus
- Futures/vision orientation
- Ideas, innovations, synergies
- Planning/design/building

3.4.1.7 Aerial images & local models:

The most simple and direct resource is an aerial view of the neighbourhood, e.g. from Google Earth or other satellite images. This can be printed large (A0) size for mounting on a wall, or A3/4 size for a brochure. This is then a very useful base-map for sketching or posting of ideas and issues, problems and solutions, comments and questions. Historical maps from Google or other sources are also of great interest to longer term residents. If time and resources allow, the best solution is the participatory building of a large neighbourhood model (1:250 scale if possible), on an enlarged local map, mounted on tables in a meeting room, as the base for a structured program of problems/visions/actions (this was not done in the Looper Living Labs).

3.4.1.8 Creative co-design:

Visual thinking is essential to capture visions, ideas, and scenarios. Each team should include a person with design and visual skills and interests, who can produce rapid sketches of ideas, projects, and places as a main part of the process. Where possible the team should include an architect, urban designer, landscape designer or similar person with knowledge of design processes, regulations, standards, budgets, construction methods and so on. The team should also include a person with skills in facilitation, mediation, or community development.

3.4.1.9 Planning for Real and open design principles:

As far as possible the complexities of the planning/development/construction process should be de-mystified, with professional expertise opened up to the 'wisdom of the crowd'. The Planning for Real (PFR) toolkit proposed that 'experts should be on tap not on top'. In the typical PFR session, the chief planner or chief engineer was invited to the meeting but requested not to speak until a question was asked (Gibson 1996). This is not an easy balance to achieve, as even the smallest urban intervention requires specialist knowledge, but even the aspiration can change the typical attitude of urban professionals.

3.5 Evaluation tools

Combining evaluation methods such as multi-criteria analysis (MCA) and multi-actor multi-criteria analysis (MAMCA) with co-creation is uncharted territory. MCA can be used to define how sustainable in an economic, environmental and social sense the co-designed ideas are, the MAMCA shows the stakeholder support for the different ideas. Using evaluation techniques can make stakeholder preferences more explicit, which can positively impact reaching consensus between stakeholders and lead to the implementation of a co-designed idea with the highest level of support from the various stakeholders. Together, these two evaluation methodologies can facilitate reaching consensus between the different stakeholders on a co-created idea that is both sustainable and has support from (most) stakeholders. This allows the Looper project to proceed to the third and final stage of the learning loop: implementation and monitoring of a co-created idea.

More information on combining MAMCA and co-creation can be found in Deliverable 3.3 Integrating evaluation tools in the Looper platform.

3.6 Co-design tools

3.6.1 Co-design tool library

The Looper project provided an analysis and evaluation of online, digital and face-to-face tools that can enhance a co-creation process in Living Labs, and in particular the co-design stage. These guidelines provide both an overview on the breadth of tools available and 21 in-depth factsheets on tools that are promising for Looper. An overview of all reviewed tools can be found on the project website[6] and in Deliverable 3.1 'Methodology for the co-design of alternatives'. As the Living Labs become more concrete, resources can be chosen according to the evolving needs.

For face-to-face interaction, a wealth of handbooks has been found. A good start are the introductory chapters of the Participatory Methods Toolkit by the King Bauduin Foundation, followed by a look-over of the 23 methods in the Collective Action Toolkit by Frog Design or the bootcamp bootleg of Stanford's d-school. The urb@exp LAB kit can be employed at the inception of the Living Lab or if direction and structure is lacking during its implementation. When reaching the creative stage, Stanford's virtual crash course can be a great engaging 90-minute activity for participants to provide them with creative energy and methods to tackle their problems.

Online co-creation tools have a great variety of functionalities that can be incorporated into online co-creation platforms. As communication is of vital importance in the co-creation process, a co-creation platform should always include a messaging and spatial commenting functionality. Which other tools are most useful depends on the needs of a platform, the technical knowledge of participants and practitioners, and available financial resources. For ready-to-use co-creation solutions, take a look at TransformCity and Citizenlab.

3.6.2 Online co-design tools used in the Living Labs

The three Living Labs used two online co-design tools: Loopertagging and NextSeventeen. Loopertagging is a geotagging application that allows users to indicate places where they believe there is a problem (e.g. excessive speeds) or where they believe a solution has been provided to solve the problem (e.g. road designs that reduce speeds) (see Figure 41). The NextSeventeen application allows users to submit and comment on ideas to improve the problem identified in the Living Lab (see Figure 42 and Figure 43).

[6] https://looperproject.eu/tools-platforms/tools/

Figure 41 The Loopertagging geotagging application

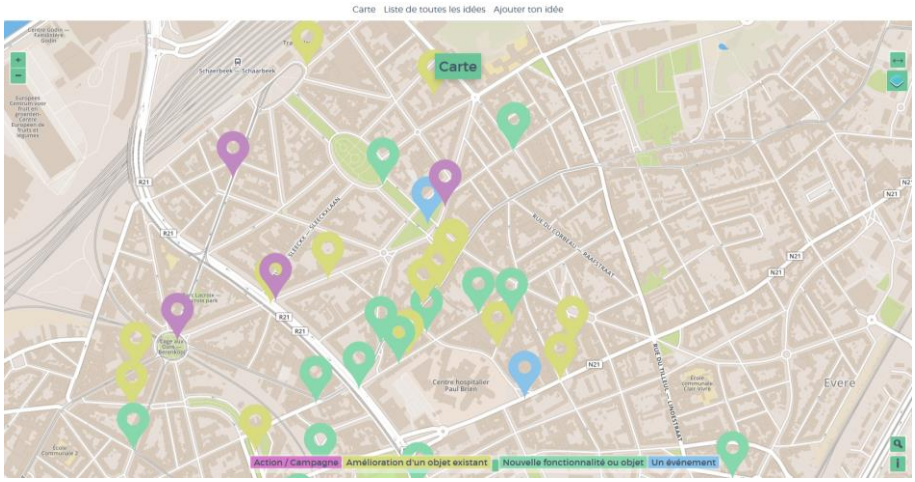

Figure 42 The NextSeventeen co-design tool – map view

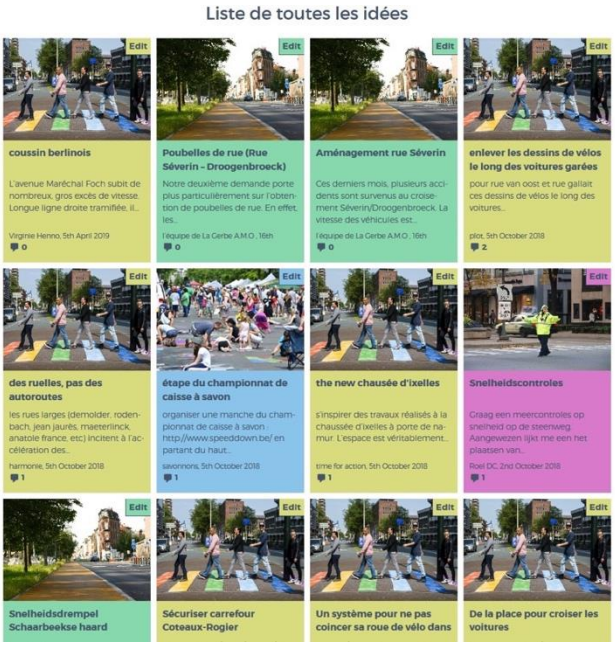

Figure 43 The Next Seventeen co-design tool – list view

4 EVALUATION AND LEARNING

This discussion chapter stands back, to review and consider the results and the implications. There are four main sections:

- *Comparative evaluation by the '6-P' framework of the Labs in 3 cities.*
- *Comparative evaluation by community and policy learning loops, of the Labs in 3 cities.*
- *Insights on deeper challenges and responses.*
- *'Key learnings' to take forward.*

4.1 '6-P' framework: comparative evaluation

This comparative evaluation works with the '6-P' framework, as in the previous section:

- **Place**: neighbourhood, district, landscape, or other area where the lab is to be based.
- **People**: networks, organizations, groups or communities
- **Priorities**: problems, issues, challenges, risks, hopes or fears, ideas or opportunities
- **Policies**: local, regional, national, for that area, with processes which can be long and complex.
- **Platform**: for exchange of information, learning, analysis and insight, both online and off-line
- **Process**: overall insights, from the whole experiment from start to finish

Note: Detailed tables on the evaluation of each Looper Living Lab are to be found in deliverables D5.4, D6.4 and D7.4

4.1.1 ***PLACES***: and what implications for place-based Labs, and area-based policies?

BRUSSELS: Involving citizens from the start made it possible to create a solution that answered their questions. Working with a school makes the location of the living lab very concrete.

VERONA: The Verona LLL showed a good combination of place with tangible problems; citizens with motivation to act; policymakers who are prepared to listen. Focusing on a wider area allows to have more participation from residents and from people having an interest on the particular area. This strengthens the sense of belonging that people usually have and helps in creating policies that actually answer to citizen's needs.

MANCHESTER: The area of Brunswick is near the end of a large regeneration project, with much physical change and disruption to the neighbourhood. The Looper ideally would have started 7 years ago at the start of this, while in reality it comes in at a late stage.

OVERALL LESSONS

Different places will respond in very different ways to a Lab or Learning Loop model. Option A is a problem-fixing approach; option B is an open co-creative transformation approach

4.1.2 ***PEOPLE*** and how did we involve (or not) hard-to-reach groups?

This focuses on the 'hard to reach' groups, but as some Labs report here, it can be a challenge to reach the general population, in complex urban areas with many different groups, and no obvious points of meeting or common interest. City Councils have the same problem, so an early consultation with the local politicians and city planners, would be a good move.

BRUSSELS: It is difficult to define who are the hard-to-reach groups, which makes it even more difficult to reach them. In general, we've had difficulties reaching the general population, so we have not had enough resources to approach further groups.

VERONA: The general population of citizens was very active in the participation. In the Verona LLL there was a wide variety of people's cultural, educational and social backgrounds. Nevertheless, some hard-to-reach groups, even if they were invited to the LLL events, did not participate in the project. This was mostly because they did not feel as part of the community or did not feel as the topic was actually affecting them. At the same time, other hard-to-reach groups where not reached by dissemination. The difficulties to involve hard-to-reach groups also happened because the dissemination of the project to possible participants was done using flyers, posters, news on websites, press conferences and by going to schools/churches to talk with their representatives to ask if they wanted to participate, but all of this was done without addressing at any specific group. This 'widespread' approach in the dissemination did not help in understanding who was actually interested in the topic, resulting in a partial waste of energies and resources. A more detailed preliminary analysis of the context would be necessary to better focus the dissemination and engagement activity to reach the interested target groups.

MANCHESTER: Deep engagement was used to reach all groups, as a major contribution in Manchester. The Lab needs to be aware of local social and political structures, in order to target its actions. On the ground there was much conflict between the different groups and agencies (making the Looper task more difficult).

OVERALL LESSONS:

The Lab needs to be aware of local social and political structures, in order to target its actions.

4.1.3 ***PRIORITIES*** and how can citizen monitoring combine with deliberation?

BRUSSELS: The co-design analysing the urgency and awareness potential of each solution started a discussion on what is most important for the neighbourhood.

Citizen monitoring is only a minor aspect of the second loop. Three residents have installed a Telraam[7] – a device that automatically counts the number of road users. In general, citizens are aware of issues regarding traffic safety and do not need to collect more data on this.

VERONA: In the Verona LLL both micro-local street improvements and area-wide policy agenda, which takes more time and money, were tested. Citizen data collection assisted in the co-designing for solutions because it helped participants to better understand the environment in which they live, and it gave them the right tools to better focus and prioritize the urban issues to be solved. By giving local stakeholders the knowledge and tools to understand the environment - and the needed data to deliberate about urban transformations - it is possible to gather more feasible solutions for implementation.

MANCHESTER: The priorities were steered towards the physical environment, which might have squeezed out other more urgent concerns on social and economic issues

OVERALL LESSONS

[7] www.telraam.net

Important for the Lab to be open about what is in or out of scope (e.g. gentrification, austerity, hierarchy). As often, the greatest priorities are the most challenging to achieve. Some of the priorities have to emerge through debate and deliberation.

4.1.4 ***POLICIES*** and governance agendas, with implications for the Looper

BRUSSELS: The city policies include for traffic calming but on a much longer timescale. School streets is a tool in the making and municipalities are still looking for best practices and concrete approaches to implement them. It is currently unclear whether school streets actually improve traffic safety.

VERONA: The city policies already included traffic calming solutions but on a much longer timescale. Innovative policies are starting to appear as citizens and policymakers have found a line of dialogue to solve urban issues together. This would make policies based only on top-down approach obsolete. With mixed top-down and bottom-up policies instead, citizens can better understand the boundaries in which public administration have to work, and in the same way policymakers can get more updated data on citizens needs and wills to focus on when planning the actions to be undertaken in a neighbourhood or in the whole city area.

MANCHESTER: The management of this large regeneration is done by a complex set of semi-public or private firms, and there is confusion and lack of trust among many residents. This adds to the potential lack of trust between residents and the large university campus on the other side of the road. Significant improvements to roads or the public realm have to go through a long process of technical development and budgeting, at a time when local government budgets are shrinking.

OVERALL LESSONS:

The Lab needs to engage with the complexity of policy, governance, and public services, and look for ways to make this open and transparent to citizens, as far as possible.

4.1.5 ***PLATFORM*** and how can data visualization/analysis enhance co-design?

BRUSSELS: The online platform made it possible for everyone to participate from home. It was a useful tool to add next to the offline workshops. The MAMCA gave a great overview of the different stakeholders involved in the interventions and what their priorities/questions are. Telraams and the online platform are the main online tools that were used in the second loop and allowed all stakeholders to share their opinion and actively participate in the loop. However, not all citizens need data visualisations in order to understand the problem. Perceptions of traffic safety is very much a subjective problem that cannot be easily quantified.

VERONA: The platform worked well for citizens who seemed to be happy to contribute their ideas and monitoring results and go online to visualize. The Verona Looper Living Lab, understood as the sum of the group of people actively participating in face-to-face meetings and any other person who heard about the project and used the online tools, was quite effective. This because participants spread the word about the project to their acquaintances, and then this got linked to the online platform as people who knew of the Looper project from others, but could not attend the face-to-face meetings, had the chance to participate in the project as online platforms allowed to collect qualitative data (while also expressing where a criticality could be found), visualise data and propose ideas. Both

face-to-face meetings and online platforms could work alone, but the project was empowered by the combination of online and offline to reach a wider audience.

MANCHESTER: The online platform was not so popular with most residents, so a range of offline methods was used – see the previous section.

OVERALL LESSONS

The digital platform can enhance working on certain kinds of problems and opportunities. The Lab needs to be aware of the digital limits, or unplanned side-effects, and provide links to the offline 'human platform'.

4.1.6 ***PROCESS:*** and the experience of setting up and running the Labs

BRUSSELS: The process showed the risks of jumping into an area without full engagement with the political forces, both top down and bottom up. The process of the school street, even if it is still improving, exists. This makes it easier to start a project and discussion in a neighbourhood. It gives us a concrete tool to talk about the larger theme of mobility.

VERONA: The learning loop methodology applied in the Looper project gave good results as it actually strengthens the co-design of mitigation solutions. This was because of the work done in the first steps with citizens (i.e. doing the scoping of issues with them, lectures on pollutants and sensors, participatory sensing activities, giving them the opportunity of positioning official sensors) empowered them by giving the right tools to face such issues. This also led to an opening towards the dialogue with policymakers as they started to explain to citizens why of some decisions, instead of simply saying yes or no.

MANCHESTER: Discussion in progress on how to extend the principles of the 3-year lab into a permanent or long-running thing.

OVERALL LESSONS

Overall, the Lab will be most successful by full engagement with all the forces and factors in the area – social, economic, environmental, political, cultural, etc.

4.2 Community and policy learning loops: comparative evaluation

This section takes an overview of the community learning loops and policy learning loops in the three Labs. We also look at the prospects for follow-up and scaling up.

The overall lessons are taken to the later sections on 'challenges' and 'key learnings'.

4.2.1 Community Learning Loops

BRUSSELS: In the second loop, we worked together with a local school, expecting more constructive results. The second loop had two communities: parents and residents. They were to learn about school streets and how school streets can contribute to traffic safety.

VERONA: The results are in line with what was expected by organisers. Citizens started to listen, and take into consideration, opinions and reasons of the public administration. This helped them into better understanding how to propose more effective and feasible ideas and solutions to solve air and noise related urban issues. Citizens also 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.

MANCHESTER: There is a push from some active residents for improved models:

- Local dialogues to be convened by local people and enabled/facilitated/recognized by MCC (there may be modest subsidies for this)
- Community organizers/mentors/convenors to be enabled and trained with MCC support (e.g. a pilot scheme 'Making a Difference Team': the cost per trainee was around £4000).
- Different round tables may be needed for different stakeholders (e.g. business, public services) but these would all attach to a general local forum.

Many such initiatives have been tried over the years, but it seems that the Looper was able to catalyse some fresh perspectives and commitment to engage, with the factors of success above.

4.2.2 Policy Learning Loops

BRUSSELS: Some of the wider lessons of Looper were fed back and discussed with policymakers in the final stage of the project. Local policymakers were looking at the Looper project to improve their way of working. The municipality of Schaerbeek had set up several school streets, but with mixed results. They wanted recommendations based on our experiences. Apart from the local policymakers, the regional policymakers also showed interest in our approach.

VERONA: 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.

MANCHESTER: There is a general push and aspiration from stakeholders, towards 'active democracy', collaborative governance, etc. Recent discussions at a large stakeholder forum in June 2019 and since, have included:

- Enhancement of existing models: ward coordination; neighbourhood forums (long history, not always successful).
- Potential of new and emerging models: citizens assemblies; participatory budgeting
- Online platform experience shows can help, with basic things, and/or advanced monitoring and data sources. It does not substitute for human interaction, however.
- Local active democracy/co-governance appears to work best with clear tangible opportunities/problems (i.e. plans and/or conflicts).
- Generally, stakeholders are looking for ways to enhance an active interface between the Manchester City Council (MCC) and its communities.

4.2.3 Follow up prospects

BRUSSELS: The municipality of Schaerbeek (where the Brussels Living Lab was located) participated in the Living Lab and showed interested in the co-created ideas to improve traffic safety. The Living Lab was also approached by the alderwoman of mobility to implement a school street using the Looper approach. The aim was to develop guidelines for other schools in Brussels that want to set up a school street. Other stakeholders have been approached for their knowledge and insights.

VERONA: It is expected that stakeholders from the Verona Looper Living Lab will remain active. The co-design phase saw a wide participation both offline and online and many ideas were proposed. Only a few ideas were implemented during the reporting period, which led to citizens demanding to proceed with the co-design and implementation of more impactful solutions. Participants proposed to the Comune di Verona to work on longer term solutions in a collaborative way, and policymakers were willing to do so. The two main long term solutions what will see a participatory approach even after the end of the project will be: implementation of the communication with the highway society to ask more substantial implementation in the noise barriers, and final design and implementation of the extension of the Santa Teresa park to increase the greenspace in the area of South Verona.

MANCHESTER: There is a general push and aspiration from stakeholders, towards 'active democracy', collaborative governance etc.

Current agendas and activities now include:

- Community resilience hubs, hosted by the City Council to respond to the post-Covid agenda, with a new program for 'Bringing Services Together': i.e. integration between all public sector providers.
- 'Community researcher' and 'community leaders' programs, where the City Council provides basic training and capacity building for mentors, inter-mediaries, grassroots organizers and social entrepreneurs, with tangible benefits (this is awaiting evaluation).
- Citizen Science approach to using bottom-up data, in combination with technical and research data, with a range of decision support tools.

Many such initiatives have been tried over the years (the first UK initiative on participation was in 1969). It seems, however, that Looper was able to catalyse some fresh perspectives and commitment to engage, with the factors of success above.

4.3 Review of challenges and responses

This section explores some deeper challenges of systems, structures, discourses, which have come to the surface through the Looper Living Labs.

Note that the Looper project did not aim to find the answer to such challenges. It seems that the community and policy innovation enabled by the Looper could help in a material way. It also seems that the success or failure of these or any future Labs.

4.3.1 Challenges of problem framing: social versus physical

It seems that improvements to the built environment are important, but these may be just the surface level of social and economic problems. Improvements to these are generally more difficult to monitor or analyse, and more controversial, but also potential more rewarding.

In Manchester, the problems of a deprived area such as Brunswick cover a wide range: unemployment or under-employment, welfare system gaps, long term illness, unhealthy diet, substance abuse linked with crime and violence, a general sense of social exclusion and alienation from the system. There are new pressures from gentrification, and the incursion of higher education (students and staff) creates negative feelings. Other practical problems come to the surface here or there, such as air pollution, noise, congestion, parking and road safety. However, a typical response from residents, was that these problems are already well known, so why should they spend time researching them? In context the large area regeneration has created much disruption but there is a generally positive attitude towards the neighbourhood and its future (there is also a counter view that the City Council and S4B are complicit in the extraction of profit by large unaccountable and tax-avoiding corporate firms).

Implications for Looper and similar living labs:

A living lab will usually be funded for some specific purpose and taking on the challenge of capitalism is probably out of scope. However, it is likely that the wider scope can bring useful insights to the problem. For instance, a problem of air pollution affects the already vulnerable population. It may be easier to learn self-help and resilience than to fix the air quality problem, at least in the short term.

Recommendations:

While a focus on tangible physical problems is a good start, it's important to keep the door open to other layers of problems, with a wider range of creative ideas, visions and opportunities.

Verona: starting from a main issue it is important to focus on solutions that can be actually implemented, even if with a long-term basis, to avoid the possible idea that nothing can be done is solutions are too unlikely.

4.3.2 Challenges where 'the system is part of the problem'

A Living Lab might find opportunities outside/between municipal plans for creative community initiatives: or, it would work closely with these plans, aiming to enhance them or connect them better to community ideas and initiatives. A third option would be to confront the authorities with problems such as air quality, which call for more radical solutions.

Experience from Manchester: while the regeneration of Brunswick is one of the largest investments of public money in the region there are many issues. Previously public housing is

now in a complex web of contractors, management and finance companies. The local shops were not viable so have been moved out of the neighbourhood. For example in Brunswick there were schemes for community gardening, creative childcare, youth clubs, and so on, generally with minimum support from the authorities: then a mural was commissioned by S4B from a professional artist, while the local youth club graffiti group was excluded.

Implications for Looper and similar living labs:

While a focus on tangible physical problems is a good start, the risk is that framing the community issues as a 'problem' to be fixed, can cut off the potential for more creative ideas, visions and opportunities.

Recommendations

The Living Lab should keep the door open to more radical ideas and aim to steer official channels towards enabling them.

4.3.3 Challenges of co-design as a socio-technical process

Experience found a particular issue with steps **(1d)** *Analysis and implications* and **(2a)** *'co-design'.* As in the literature on community architecture/planning/development, there can be many stages in a long and complex process, and many sub-loops of decision-making and evaluation. In particular this often raises tension between professional expertise and 'lay' citizen knowledge. (There is also pressure from the financial gaps in local government, to get the citizens to do survey work at zero cost, e.g. the Local Development Framework in Manchester). The Looper Manchester aimed at co-design, but from the community architecture perspective, a fully participative and collaborative co-design process was difficult to achieve. In Manchester there was open 'co-discussion' on the options: then the basic principle of traffic calming was vetoed by the chairman of highways: the 'design' was then basically a search for funding for a partial scheme, discussed by a small inner circle, and then reverting to details with technical experts. Meanwhile for the democratic 'learning loop', it was difficult to consult with the wider community on half formed ideas without a clear funding source.

Implications for Looper and similar living labs:

From the perspective of community architecture/planning/development, the process should be as transparent as possible (Ravetz 1995 and 1999). Given the tension between experts and citizens, the experts have a role in de-professionalizing and opening up decision points and multi-criteria options to democratic dialogue (the citizens have a role to play with the learning loop on how the system works).

From the perspective of community politics and the 'ladder of participation' (Arnstein 1969), we look for the steps from 'manipulation' to 'participation' and towards real 'empowerment'. Sooner or later this means taking democratic control of resources (land and finance) away from elites and into the popular domain and creating new forms of dialogue and synergy between technocrats and citizens, (a controversial and political move).

Recommendations

Community (co-) design processes should be opened up, so the many stages and decision points are transparent and open for contributions, as far as possible.

4.3.4 Challenges of co-learning, leading towards a 'collective local intelligence'

While the Learning Loop principle is positive, the reality may be messier and more unpredictable, as shown in the 3 Looper cities. The search for funding or the political process could be at the centre of the picture, more than any co-design options: for instance a road safety/traffic congestion problem may be controversial, where different groups (e.g. residents/businesses) have different views and look for different data to support them. Meanwhile there are social innovations which might be quicker and cheaper, but where the effects are difficult to monitor. However even if funding is difficult and little is achieved on the ground, there may be a positive effect on community capacity building.

What is crucial is the scope for creative innovation and collaboration. If the worldviews and opportunity spaces of actors are all fixed, then it is a zero-sum game: but if there is scope for collaborative learning, creative innovation and social intelligence, then the potential is huge. Hence this picture of urban and spatial planning as a 'contested space' – with a struggle to move beyond the adaptive style 'winner takes all' zero-sum competition, towards a more synergistic, net-positive game. This can be framed as a *collective local intelligence* - the capacity for a community or communities, to collectively learn, think, co-create and co-produce services and value added.

Implications for Looper and similar living labs:

The implication of the learning loop principle is that communities and policymakers will over time, learn and think and so extend their capacity of *'collective intelligence'.* The higher purpose of the Living Lab is to enable this process, and where possible to guide it to practical applications.

Recommendations

All policy and practice should demonstrate its effects on the *'collective local intelligence'*, meaning the capacity of a local community for learning, thinking, co-creation and co-production.

4.4 Key learnings and research insights

This section puts the results together for a set of 'key learnings' and recommendations for future implementations of the Looper model and co-creation processes. For examples/illustrations on these topics, see the Looper Brochure.

4.4.1 Keep the people on board

People are busy. Not everyone is interested in spending their evening discussing traffic safety or air pollution. Keeping the people on board can therefore be challenging.

A clear goal that comes from a bottom-up initiative can help to keep citizens motivated. A successful co-creation process often builds on a local actor or initiative which is trusted by citizens. Try to keep the co-creation process as compact in time as possible as a long process may lead to participation fatigue and people dropping off along the way. In order to go beyond the 'usual suspects' – people that you know will be interested in your topic – it is important to reach out to others. Success also depends on coordination with local programs for planning and regeneration, to avoid duplication and add value.

Citizens identified traffic safety as their main concern in the **Brussels** Looper living lab. However, the issue had already been taken up by a local citizen initiative. It was therefore difficult to attract attention to the living lab, which resulted in a low attendance of meetings. In the follow-up co-creation loop, the living lab joined an existing initiative of local schools and the municipality to

pilot school streets. This made the goal of the co-creation process very clear: co-designing, implementing, and monitoring a school street.

The co-creation process in **Verona** was partially a continuation of an already existing citizens' movement to improve air quality in the Verona Sud neighbourhood. The City of Verona was also a partner in the living lab and different employees from the city council participated, depending on the requested technical skills. The presence of researchers as neutral facilitators of the Looper living lab helped in clarifying some misunderstandings that emerged between policymakers and citizens.

In **Manchester,** the living lab took time to make relations and local links, before jumping to a definition of the 'problem'. The living lab neighbourhood was in a large regeneration program with disruption all around, which offered a wide array of possible problems to address. Then followed a period of discussion as to which problems might/ (not) be in our scope to address.

4.4.2 Co-creation means sharing knowledge

Citizens have local knowledge that decision-makers may lack and would want their ideas to be implemented as soon as possible. Decision-makers have policy and expertise knowledge that citizens lack, but the complexity of a large administration with competing demands can seem to delay or block local ideas. A co-creation process should therefore enhance the exchange of different types of knowledge between citizens and decision-makers, as well as other stakeholders.

In **Brussels**, citizens seemed unaware of possible administrative procedures that were necessary for the implementation ideas, some of which required major reconstruction of public spaces. The municipality, on the other hand, wanted ideas that could be quickly implemented. These diverging expectations led to disappointment with some citizens in the first loop. In the second loop, the living lab team up cooperated closely with the municipality in order to make sure their knowledge was transferred to citizens and have realistic expectations of what is possible.

In **Verona**, decision-makers were a project partner since the beginning, and an active citizen association was already working on the topic actively. Sharing the knowledge of the city administration with other stakeholders allowed for a better understanding of the different points of view, criticalities, and agendas. If citizens understand why decision-makers act in a certain way (and vice versa), it can result in a more constructive co-creation process.

In **Manchester**, after many experiments, the 'ladder of participation' still points upwards to the ideal of 'community empowerment'. But in practice there are complex government processes for decision making on plans and budgets, otherwise well-organized and well-funded communities tend to grab power and resources.

The experiences in the Looper project show that a focus on grassroots co-creation can be more effective than direct competition for budgets. For example, physical interventions to improve traffic safety can be very expensive and need time in planning and budgeting, but a social innovation can be low or zero cost. Clearly, there is a more optimal middle ground, which aims for positive synergies between top-down planning/development and grassroots ideas.

4.4.3 Measure stakeholder support of co-designed solutions

The co-creation process should look beyond just involving citizens and the decision-maker to allow local businesses, transport operators, employers, schools, etc. to participate. This way the process can lead to solutions that are supported by most of the stakeholders increasing the chances of implementation. Ideally, co-creation will lead to a consensus

between these stakeholders about the solution(s) that will be implemented. If this is not possible, a compromise can be found between most of the stakeholders. Formal evaluation methods can help urban and transport planners and decision-makers to evaluate the feasibility, sustainability, and stakeholder support of the co-designed ideas.

A participatory evaluation method called Multi Actor Multi Criteria Analysis (MAMCA), supported by an online software[8], was used in the Looper living labs to show how different stakeholder groups would be affected by the co-designed solutions. This gives stakeholder groups a good view of their own position towards the co-designed solutions as well as the preferences of other stakeholder groups. This participatory evaluation helps the knowledge sharing process and can be used to reach a consensus between stakeholder groups on which idea(s) will be implemented and monitored.

In **Brussels**, five co-designed ideas were evaluated using MAMCA. This evaluation showed that there was consensus between the stakeholders on the most preferred idea and that therefore no obstruction from a stakeholder was expected when the idea would be implemented.

In **Verona**, nine main groups of ideas were evaluated using MAMCA. The process was adapted to the Verona situation since different ideas were to be implemented in different places. Results from the evaluation confirmed the three ideas that already had popular support during the co-design activities.

In **Manchester**, thirteen ideas from the community visioning were evaluated with an offline non-technical version of the MAMCA. In practice, the decision of which ideas would be implemented was based on the limits of time, cost and risk.

4.4.4 Build trust between local actors, researchers and policy makers

"It's not us who are hard to reach, it's you researchers" (quote from a resident of Brunswick, Manchester). This demonstrates the potential divisions and differences of language, culture and expectations. When researchers or governments set up living labs or co-creation processes, they may be perceived by citizens as strangers and coming from the 'outside'.

While academics and policy makers may have more technical knowledge on an issue, they may not have the network or capacity to reach citizens. Building trust between citizens and the living lab organisers may therefore take time and effort. A **local anchor** – e.g. a local NGO, business, or school – may facilitate this process because citizens already trust this actor. It seems crucial to find ways through the typical distrust and alienation of citizens from public authorities, especially for minority social groups, ethnic or cultural groups, and particularly young people.

In **Brussels**, there was initially a lack of successful engagement with minority groups. Although the living lab was open to everybody, it was the 'usual suspects' – people with an interest in and knowledge on mobility – that joined most often. Throughout the project, the living lab organisers decided to visit the hard-to-reach groups instead of waiting for them to come to us. This increased the diversity of participants in the living lab.

In **Verona**, researchers played the role to link different stakeholders, and this could reduce misunderstandings. It is better for the process if organisers are not directly involved as stakeholders, since their neutral position allows a bridge-building chance for other participants and policymakers.

In **Manchester**, special effort was made on the 'people' side, with focused outreach works, participation within community groups and initiatives, with an open mind and listening ear. This program also worked closely with the community liaison officer from the housing agency S4B.

[8] www.mamca.be

4.4.5 Combine online and offline tools

New digital tools for data collection, visualisation, idea generation and monitoring can help to facilitate knowledge sharing and the learning loops, especially for larger areas. But human contact is still needed to motivate, share and discuss the results, and many communities prefer 'offline' forums and workshops.

With **low-cost sensors** to measure air pollution, noise or traffic, citizen monitoring can be very effective in the first stage of problem identification. In **Verona**, participants used low-cost sensors or hosted an installation in their houses: the digital maps of air pollution were then a 'wake-up' call for the community and policymakers. In **Manchester**, most of the monitoring was done by masters students, as most residents were offline and more solution-focused. In **Brussels** in the second loop, innovative camera equipped, low-cost minicomputers (Telraam) were installed by residents to measure traffic volume and speed.

Direct interaction can work through informal spaces and arenas, and the Lab organizers should aim to meet the community wherever they are. Community noticeboards using a wall or whiteboard in a local space are essential for those without digital know-how, as is an open-door office, where Lab organizers are on site at certain times. In **Manchester**, the Brunswick 'Well-being Lunch' worked with volunteers to provide low-cost food twice per week. In **Brussels**, there was a ready audience of school street users.

Experience shows **hands-on tools** are more likely to generate positive synergies between stakeholders. The simplest thing is a large size map or aerial view of the neighbourhood, e.g. Google Earth, as a base for sketching or posting of issues and ideas. In **Manchester**, the Ketso toolkit was the main way to gather and debate ideas[9] and the Synergistic method uses only flipcharts and sticky notes.[10] The **Looper co-design tool database**[11] provides recommendations for such tools, but other database exist[12]. Overall, **visual thinking** is essential to capture visions, ideas, and scenarios, and each team should include for design and drawing skills.

[9] www.ketso.com
[10] www.manchester.ac.uk/synergistics
[11] www.looperproject.eu/tools
[12] ccn.waag.org

5 RECOMMENDATIONS AND NEXT STEPS

This final chapter is an overview of the results and ways forward, with four main sections:

- *Looper Model principles*
- *Implications for further research*
- *Implications for further policy development*
- *Next steps*

5.1 Looper Model principles and recommendations

The development of the Looper Model has highlighted some general principles:

- **Principle of the 'loop':** all types of information/knowledge should connect between users/providers/decision-makers;
- **Principle of the 'platform'**: both online and offline for knowledge sharing;
- **Principle of the 'round table':** the basic structure of collaborative governance ('co-governance'), for participation and co-creation.

These point to recommendations for the different levels of learning loops:

- **Management loop**: addressing functional/technical problems, with online as well as offline tools, this aims to link citizens to technical systems;
- **Community loop**: addressing local social-cultural problems/opportunities, this aims to keep residents and organizations 'in the loop' so that good ideas can be realized;
- **Policy loop**: addressing more strategic policy problems/opportunities, this aims to use co-design and evaluation for complex challenges and creative solutions.

For each of the three types of learning loops, this is a summary of the recommendations:

5.1.1.1 Management loops

- Technology can be very useful for technical problems but it's not always the answer to human problems. So be aware of which is which.
- Use a combination of online and offline tools to suit all stakeholders
- Coordinate between citizen monitoring (cheap/variable) and expert technical monitoring (costly/high quality)
- Explore the knowledge pathways, i.e. not only what information but where does it go, who can use it.

5.1.1.2 Community loops

- Keep local residents and organizations 'in the loop'
- Use both digital platform/offline network/mentors
- Enable grassroots ideas and projects where possible, particularly from 'hard to reach' groups
- Create flexibility in policy and planning process, e.g. popup shops

5.1.1.3 Governance loops

- Set up digital platform to collect local problems and ideas.

- Use concept mapping systematically to understand the nature of the problem
- Use evaluation systematically for ideas and options
- Explore new ways to get the information into the policy and planning system.

5.2 Next steps

This report is a brief summary of the Looper Model, Looper Toolkit, and the Looper project which has developed and tested them. More detailed guidance is available in the project reports and online resources on the Looper website[13].

If you are working with an urban area, where community-based co-creation could bring new ideas and new synergies between all stakeholders, you can use the Looper Model and Toolkit:

- *Set up a Looper Lab, structured around the '6-P' (people, place, priorities, policies, platform and process).*
- *Set up the Looper Toolkit, with online/offline platforms and tools for monitoring, co-design and evaluation.*
- *Set up Learning Loops, for technical problems, for community empowerment, and/or policy innovation.*

And then... explore the potential for urban transformation.

5.2.1 Implications for further research

Looper brings together a very topical range of social science thinking, and the results are now being taken forward in the academic community, for further research:

- Smart technologies and their socio-technical applications: an agenda to balance the power of surveillance capitalism and government by algorithm, with a '*collective human-artificial intelligence*' (AI Institute 2017: Ravetz 2020);
- Participatory planning and collaborative governance, with new forms of localized democracy and empowerment: an agenda for a so-called '*Lo-co-gov-3.0*' (Cottam 2016);
- Organizational learning and change management: how larger public or corporate organizations can learn, adapt, innovate and evaluate, in times of turbulence and disruption;
- Social innovation and community enterprise: the dynamics of social inclusion, social capital, social renewal, social mutuality and similar, where the *Living Lab 3.0* model is both enabler and enabled;
- 'Multi-helix' university-civic-business-academic partnerships, or 'multi-versities', as sites for mutual exchange, where many can learn from and with many.
- *'Local-onomics'* and the *collective local intelligence*: calling for 'smart inclusive growth' and similar agendas for integration of social, technical, economic and cultural values (RSA 2016).

5.2.2 Implications for further policy innovation

- ***Participation in planning and design***: in general, every process of policy development, in urban planning, local planning, regeneration, housing strategy, transport strategy should be part of an in-depth citizen/community participation model.

[13] www.looperproject.eu

- ***Urban environmental policy***: citizen participation/monitoring/evaluation should be an essential part of policy development, in transport, environment, housing policy, etc.
- ***Community development***: the use of citizen-based tools for monitoring, co-design and evaluation should be an essential enabler and catalyst for community development and empowerment. Other factors are also important, e.g. networks of mentors/intermediaries, public information platforms, round table forums and assemblies.
- ***Public service improvements***: for education, health, transport, social welfare, economic development, business development, urban regeneration, and others: the active input and participation of users/clients/citizens is essential, alongside feedback channels which are effective and reaching the 'hard to reach' communities.
- ***Evaluation and appraisal***: all public policies programs and projects should include for advanced, transparent, multi-actor types of evaluation/appraisal, with both online versions and off-line equivalents.
- ***Inclusive growth agenda***: community development is not only a goal, but also a means to bigger agendas, such as that of 'smart inclusive growth': where deprived communities are enabled to define problems and turn them into practical actions, then economic productivity and competitiveness will increase, along with social capital and inclusion.

6 REVIEW OF THE PROJECT OBJECTIVES

This section is a reflection and summary of how the Looper project fulfilled its original objectives, with intensive learning by all involved.

The Looper project aimed to research and demonstrate 6 main themes. This summary of the research objectives from the proposal shows what we found.

1. ***Technology enhanced learning loops:*** *Demonstrate the 'learning loop' principle enhanced by smart technology. A participatory co-creation methodology and platform of interlinked planning tools has been developed that extends co-creation to the full planning cycle, i.e. the identification of problems, co-design of alternatives, implementation and monitoring.*

The Looper Living Labs each demonstrated in some way how the *'learning loop'* principle could be enhanced by smart technology. The direct result was in small but significant interventions: the wider implication is that the 'smart learning loop' principle is valid and useful, if the lessons from this demonstration can be applied.

Moreover, the Looper experience also showed that the technocratic approach and technical information alone is not enough, for success we have to work with the context of people, policies, places etc (as in the 6-P framework).

Looper has demonstrated various ways to achieve this:

- D2.3 Scientific publication of improvement of co-creation through participatory data
- D4.1 Implementation handbook for the urban living labs

2. ***From data to useful knowledge:*** *Produce guidelines for the translation of raw information from participatory data collection into validated and useful knowledge for stakeholders through visualisation.*

We need to map the ways in which knowledge is too often kept as exclusive expert knowledge (even within the same organization). Air quality data is one example: the science is complex, with variations by time, location, season, weather and cross-reactions: but the policy advice is quite simplistic, with red-green signals. So there is potential for some inter-mediate information targeted on social groups.

Guidelines for the translation of raw data into information and for the collection of raw data can be found in the following deliverables:

- D2.1: Report on data collection procedure framework
- D2.4: Report on the legal and regulatory frameworks applicable to data collection in living labs

These guidelines suggest a general procedure for data collection framework and also some specific tools and methods that can be used. Starting from technological suggestions of these guidelines is therefore possible to implement a process that lead to the creation of knowledge from data. Nevertheless, how we learned from the Looper project, to really produce knowledge from data is necessary to be aware that we can define the data/knowledge range as follows:

- ***'Information'*** : data from technical monitoring, or citizen-generated
- ***'Knowledge'***: cause-effect links from pollution to health, to policy responses and processes
- ***'Insight'***: deeper and wider understanding / debate on how and why such problems arise

3. ***Evaluation methods:*** *Develop a methodology to link participatory data collection and co-designed alternatives to formal quantitative evaluation methods (Multi-Criteria and Multi-Actor Multi-Criteria Analysis [MAMCA]).*

The project has demonstrated how the co-designed alternatives can be evaluated using multi-criteria analysis (MCA) for the assessment of sustainability and multi-actor multi-criteria analysis (MAMCA) for the assessment of stakeholder preferences. MCA and MAMCA have been applied in all three living labs adapting the approach to the local context and the diversity of the problems being addressed.

The Looper experience found that formal MCA/MAMCA is very useful for structured formal problems. In reality many of the problems in the community are often of a many layered *deeper complexity*, and not formally structured, as it was demonstrated in the Looper labs. So for these we need to explore more of the problems in an open evaluation/deliberation process, but some of the steps of the MCA & MAMCA can still be useful (e.g. identification of stakeholders, their objectives and criteria, assessment of criteria weights in order to assess the priorities of the stakeholders).

Looper has demonstrated various ways to achieve this:

- D3.3 Report on the specifications for integrating evaluation tools in the Looper platform

4. ***Co-creation in the local environment:*** *Demonstrate and compare how citizens and other stakeholders can gain environmental, social and economic benefits from a full-blown co-creation process in different spatial, cultural and thematic contexts.*

This raises questions on the meaning of a 'full-blown co-creation' process. Starting with the Arnstein (1969) 'ladder of participation', from political manipulation to community empowerment, we then input the contribution of organizational learning (Learning Loop) theory (Argyris and Schon 1996), and then the new potential of digital platforms, apps, monitoring, visualization and big data analysis. The 'full-blown' version can focus on each of these three dimensions, or on the inter-connections between. In practice the Looper project managed to demonstrate parts of each dimension, with some pointers to the inter-connections.

The Looper contributions here are in various deliverables:

- D3.1: Guidelines for the co-design of alternative solutions

5. ***Learning loops in local governance:*** *Produce a set of recommendations for civil organisations and local authorities to develop learning loops of co-creation to address conflicts and mobilize synergies in the public realm.*

The recommendations are listed in Section 6-1 and 6-2. In summary they include:

- Participation in planning and design
- Urban environmental policy
- Community development
- Public service improvements
- Evaluation and appraisal
- Inclusive growth agenda

Reccomendations can also be found in:

- D8.3: Synthesis for Policy Makers report.

6. ***Smart participation for urban planning and design:*** *Advance the knowledge of urban practitioners on how smart participatory processes that include multi-domain aspects and a combination of traditional and online participatory tools can improve urban planning and design processes.*

This is perhaps the most interesting and controversial outcome of the Looper project. There is much attention on the digital potential with platforms, apps, big data etc. Experience so far shows this can be very useful for problems which are framed by data, e.g. air quality in a particular location. If the problem frame is extended to ask, why are some kinds of people breathing the pollution of other kinds of people, this is a more political and/or ethical question. Here the smart monitoring data and smart participation process can be a useful input to a wider debate.

Various publications (listed in the next section) also address these questions and point towards further research.

ANNEX

7 LITERATURE REVIEW AND THEORETICAL BACKGROUND

This section is a brief outline of the key academic agendas raised and explored through the Looper project.

7.1.1 Social science context

Many insights have emerged in the later stages of the project, which are now being addressed in a set of scientific papers:

- Political science perspective on new forms of local participation and co-governance
- Operational research/cybernetic systems perspective, on the policy cycle from problem to outcome
- Organizational change perspective on social learning with single/double loops
- Socio-technical perspective on citizen monitoring and its social effects
- Urban technology perspective: the experience on the ground of various methods and tools for working with air quality, noise, traffic etc.
- Living Labs as a site for urban experimentation and trans-disciplinary innovation

Behind the Looper concept (and its methods and tools) stands a wide range of current theory and practice.

Here we review two strands of social science thinking, each relevant to the Living Lab agenda:

- Social/organizational learning, systems cybernetics and partnership working, i.e. ***'co-production'***;
- Public participation, associational/active democracy, and collaborative or ***'co-governance'***.

In each there are many links to topical issues, not covered here, with both positive and negative sides. For instance, *'co-production'* is highly relevant to the digital potential for citizen monitoring, smart city systems and services but also to the real possibilities of extractive finance and privatization. Likewise, *'co-governance'* is highly relevant to digital analytics, direct democracy and responsive public services but also to potentially negative outcomes of surveillance capitalism and government by algorithm (Zuboff 2016). We can also compare to the question of 'urban transformative capacity' (Wolfram 2016). This is typically framed with the 'city' as a distinct unit of analysis (while much urban geography argues otherwise) and with 'inclusive and multi-form' governance (which might bypass structural inequalities). However, the propositions in this paper of *co-production* and *co-governance* fit broadly into this overview. Some further directions are suggested in the conclusions, along with reality checks on the *Living Lab 3.0* model.

7.1.2 Social learning, partnership working and 'co-production' themes

Organizational learning theory is at the centre of the Living Lab model, with the concept of reflexive feedback, within and around institutions, public or private, large or small (Argyris & Schon 1996). Beyond a narrow view of learning as 'gathering facts', organization studies

identified a 'Mode 2' or 'double loop' learning cycle, looking towards a *wider* contextual knowledge, with *deeper* values and goals. Some also propose a further level of 'Mode 3' learning (Elia and Poce 2010). This wider/deeper learning agenda has also extended from the learning of information ('know-what'), towards active skills ('know-how'), social relations/networks ('know-who'), and learning of social norms and values ('know-why'). This applies to individuals in the education system, but also to organizations and institutions, and increasingly to communities and social networks. It also has a strong connection to the Looper agenda of '*learning loops in the public realm',* where the evaluation framework used this four-part scheme:

- Learning *'know-what'*: is there informational or technical content (which might be provided or signposted);
- Learning *'know-who':* can policymakers/professionals learn how the community works: and can the community learn how policy works?
- Learning *'know-how':* can the community learn how to self-organize, build capacity and mobilize: or the policy system learn how to innovate and adapt?
- Learning for *'know-why'*: how can policymakers learn that grass-roots activity can empower the community and lead toward a more harmonious society?

A cognitive approach explores the difference between 'tacit' knowledge versus 'formal' knowledge of individuals or organizations (Nonaka 1991). And for a dynamic view we refer to developmental psychology, with dual tracks of 'assimilation' and 'adaptation' (Piaget & Inhelder 1973). Scaling from the individual level to societal, it seems that social learning (i.e. 'co-learning') is more than a one-way acquisition of knowledge, more a process of finding 'adaptive fitness' between social systems and other systems, i.e. some kind of 'collective wisdom' (Landemore & Elster 2012). Learning is also framed as a co-evolutionary process for social norms and institutions, and their 'social institutional co-design' (Ostrom 2005).

Organization learning theory took a parallel track with the 'systems cybernetics' concept of reflexive feedback: this frames a policy or service cycle, which responds to conditions, makes effective decisions, evaluates the feedback and improves/adapts. It uses ideas from 'second-order cybernetics' (where the observer is part of the system) (von Foerster 2003) and 'critical systems heuristics', relevant for larger organizations with multiple and conflicting objectives (Ulrich 1994). The practical challenge is then that large organizations, public or private or civic, are continuously asked to 'learn' and 'innovate', and the agenda of a small-scale Living Lab can easily be lost in the mix. However, such organizations often focus their learning on material productivity or cost saving, and the wider/deeper agendas of participation and inclusion need to be reinforced.

Social or *collective intelligence* can then be framed as one logical outcome of social learning. Without a single definition, one starting point is with Gardner's (1983) 'multiple intelligences', which looks beyond the traditional frame of problem-solving. 'Emotional intelligence' is now essential in business and management: cultural intelligence is vital in creative arts and media, while ethical intelligence helps to manage business risks. The combination of all these is framed with the 'synergistic' framework and method for mapping/design of a *collective urban intelligence* (Ravetz & Miles 2016: Ravetz 2020), as in Section 4 below.

7.1.3 Government, participation & co-governance themes

If governance is the structural organization of society, it is then crucial to the *collective intelligence*, whether local or urban or national in scale. With a frame of social 'network governance', we look for collective action to emerge from social learning (Head 2008). Then the model of 'associational democracy' sets out the ground-rules for collaborative working between groups and networks, citizens and state, or workers and management (Baccaro 2005: Hirst 1994: Westall 2013). Such a system aims at 'co-learning' from real-time feedback, 'co-creation' of new

ideas, and ‘co-production’ of services, public or private. With online platforms, social media and genetic algorithms, new possibilities emerge for collaborative learning, strategic intelligence and horizon scanning, moving beyond linear-style ‘information’ towards a more open-source synergistic ‘wisdom’ (Duval 2010: Simon et al 2017).

For a deeper cultural approach, for complex decisions with multiple values, ‘deliberative democracy’ addresses such open-ended questions with in-depth discussion (Fishkin 2009; Gutmann & Thompson 2004). Given the many-layered complexity of society, the complexity of governance systems should match, as in the ‘law of requisite variety’ (Hoverstadt 2008: Ashby 1956). This is then a guide for the many practices of elicitation, participation, visioning, mediation, consensus building and evaluation (Geyer and Rihani 2010; Noveck 2015).

In all this citizen participation is central, with the principles of ‘direct democracy’ to mobilize the wider *collective social intelligence*. But such participation has experience of both success and failure, which can be mapped as steps on the well-known ‘ladder of participation’ (Arnstein 1969). This charts a range of processes, from ‘manipulation’ where information is rationed for specific purposes; to ‘consultation’, ‘dialogue’ and ‘legitimation’, where information is shared for collaborative agendas. Moving towards the ideal of ‘citizen power’, not only information and control of agendas, but economic resources are devolved.

In one practical application, community architecture/planning used this ‘ladder’ to restructure the collaborative or co-design process, from concept and feasibility, to construction and maintenance (Ravetz 1995). In this model of design as learning, the community ‘learns’ how development works, while architects/planners ‘learn’ how the community works, through the co-design process. A parallel approach from systems science is with community-based Operational Research, which extends decision-making to a wider set of non-experts (Midgley et al 2018). This observes how large institutions tend to centralize and remove the ‘decision point’ from the ‘impact point', thereby reinforcing patterns of exclusion and alienation.

7.1.4 Evaluation and assessment themes

There is a huge literature on evaluation and assessment, in education and learning, governance and policy analysis, and especially in sustainable development policies and programs (Ravetz et al 2004). There is also a literature on ‘valuation’ which explores the links (or conflict) between material (economic) and non-material (social-cultural) values (Ravetz 2015). Projects such as City-Keys, Eurbanlab or CASI offer project-based assessment methods, which contain various combinations of social, environmental, economic and policy-level issues. City-Keys and Eurbanlab push beyond the mainstream assessment fields to include indicators for ‘propagation’, i.e. replicability and scalability of the innovation. The Looper D4-1 ‘guidelines’ proposes the City-Keys indicators as the first choice for monitoring and priority setting for urban environmental conditions.

8 REFERENCES

8.1 Glossary

(These items are based mainly on Scanagatta, 2020)

ACTORS	PEOPLE, ORGANIZATIONS, COMMUNITIES WITHIN A SYSTEM
Co-creation/co-design/co-innovation/co-learning/co-production, etc	Collective/collaborative forms of creation, design, innovation, learning, production etc
Co-creation	Form of public participation that focuses on innovation and creativity. Participants often have a high level of influence in the process. Within Looper, the co-creation process includes a series of activities: identifying the problem, collecting data, visualising data, co-designing solutions, evaluating solutions, and implementing and monitoring solutions.
Cognitive capital	System capacity for collaborative co-learning, thinking, creating
***Collective intelligence/ Collective urban intelligence,* etc**	System level capacity for conscious-cognitive complexity, with synergies which are *deeper, wider, further*: as applied to cities, economies, technologies etc
City Council	Local government of the built environment where the co-creation process wants to trigger urban transformations.
Citizen	Inhabitant of the built environment that is considered by the co-creation process. Within the citizen group there is also the sub-category of 'residents', who are the group of people owning an estate within the actual neighbourhood targeted by the project.
Co-design	Part of a complete co-creation process which refers to the 'transparent process of value creation in ongoing productive collaboration with, and supported by, all relevant parties, with end-users playing a central role' and covers all stages of a development process
Data collection	Process of gathering and measuring information on the topics defined within the scoping activity of the co-creation process. The goal of the data collection is to capture quality evidence to allow an analysis that can lead to the formulation of convincing and credible answers to the questions that have been posed
Data visualisation	Graphical representation of information and data. By using visual elements like charts, graphs, and maps, data visualisation tools provide an accessible way to see and understand trends, outliers, and patterns in data, and thus by giving them knowledge for the following co-design activity.
Evaluation	Process of critically examining the work done during the co-design. Its purpose is to make judgements about the proposed designed ideas, to check their likeness by all stakeholders, and to check their feasibility to be implemented in a real environment.

Final user	The person (or organisation, or group of people) that uses an area or a service that is located within the project area.
Informatics	Information/communication technologies and applications
Intelligence	Capacity for 'learning, thinking, creating, producing': can be social, technical, entrepreneurial, ecological, political, cultural, etc
Living Lab	A general vehicle for co-creation that usually includes end-user involvement, open and social innovation, a form of governance (often by a public body), and a real-life setting. A Looper Living Lab is an advanced version of a living lab in which the 'learning loops' are the focus of study.
Looper Model	A structured set of methods and tools to support local co-creation. This includes the Looper Living Lab with a 6-P structure: the Looper 'learning model' of problem-idea-action: and the Looper Toolkit to enable the 'learning loops,' which bring together local knowledge with local decision-making.
Looper Toolkit	This comprises online and offline tools to support the learning loops.
Looper Living Lab	This is where the Looper Model is put into action, with a '6-P' structure. It is an experimental zone where new ideas can be tried, and new ways of co-creation can be tested. Inside the lab, there can be any number of loops for different problems, from purely technical issues, to wider social challenges
Monitoring	This term has two meanings within the Looper research, it can either mean monitoring the process or monitoring values collected with sensors and/or tools. When monitoring the process, the acquisition of knowledge is the indicator to check. When monitoring values, data collected are showing if there are changes after implementing a mitigation measure.
NGOs	A non-profit organisation that operates independently of any government, typically one whose purpose is to address a social or political issue.
Official bodies	Any other office and body linked to the city council that might be interested in the project, and that might help in the process. Official bodies might help for the data collection, for the implementation or for both depending on their abilities.
Participatory approach	Process where participants (putative, potential or future) are invited to cooperate with designers, researchers and developers during an innovation process.
Private organisations	These can be private parties, linked to neither citizens nor city councils, interested in the process if the aim of the project is that of working on development areas or something similar.

Scoping	The activity - or practice - of eyeing and examining what happens within the urban environment tackled by the co-creation process, this to evaluate possible criticalities to be investigated by the Looper Living Lab. The scoping can also find good examples, that might be interesting to replicate.
Stakeholders	People, organizations, communities within a system: A stakeholder is a party that has an interest in something – or somebody – and can either affect or be affected by it.
System	A set of inter-dependent components where the whole is different to the parts: can be human (actors), tangible or intangible entities (factors or 'actants')

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9 COMPARATIVE TABLES

This is a 'master summary' and comparison between the 3 cities. It takes relevant information from the D4-2 'Evaluation Summary' report from each of the 3 cities.

9.1 Looper Living Lab evaluation

	BRU	***VER***	***MAN***	***Overall lessons***
4a) PEOPLE				
How did we involve (or not) hard-to-reach groups?	Reaching the hard-to-reach was not a priority because it was already quite difficult to reach those who usually are not hard to reach. Nevertheless, the cooperation with a primary school with a diverse student body during the second loop did increase engagement with the "hard-to-reach".	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. 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.	Deep engagement techniques were used to reach all groups, (this was a major focus in Manchester.	*The Lab needs to be aware of local social and political structures, in order to target its actions*
4b) PRIORITIES				
How can citizen monitoring combine with deliberation, to assist in ***co-design for solutions*** *in the urban environment?*	Analysing the collected data and communicating it in an easy to understand way allows citizens to improve their understanding. This can then lead to citizens suggest solutions.	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.	The priorities were steered towards the physical environment, which might have squeezed out other more urgent concerns on social & economic issues	*Important for the Lab to be open about what is in or out of scope, (e.g. gentrification, austerity, hierarchy): as often the greatest priorities are the most challenging to achieve. Some of the priorities have to emerge through debate and deliberation.*
4c) PLACE				
what are the implications for place-based Labs, and area-based policies in general?	Place-based labs should have a strong, physical presence on the ground. Without this presence, it is difficult to connect with citizens and	The place could benefit from the Lab since it was possible to better understand how to face possible issues and criticalities.	The area of Brunswick is near the end of a large regeneration project, with much physical change and disruption to the neighbourhood. The Looper ideally would	*Different places will respond in very different ways to a Lab or Learning Loop model. Option A is a problem-fixing approach: option B is an open co-*

	stakeholders. In the Brussels Living Lab, we were mostly seen as outsiders. The scale of a lab also matters. In the first loop, we focused on a whole neighbourhood. This might have been too big of a scale when looking at the co-designed solutions, which were often very local and small in scale. In the second loop, the location of the living lab was very precise: the street in front of the elementary school.	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.	have started 7 years ago at the start of this, while in reality it comes in at a late stage.	*creative transformation approach*
4d) PLATFORM	*Was there an effective offline/social platform?*			
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. The platform produced some positive moments of confrontation because people who could not participate were able to share their point of view. 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.	The online platform was not so popular with most residents, so a range of offline methods was used.	*The digital platform can enhance working on certain kinds of problems and opportunities. The Lab needs to be aware of the digital limits, or unplanned side-effects, and provide links to the offline 'human platform'.*
4e) POLICIES				
	Having citizens collect data can be useful for governments to engage citizens as well as to develop (citizen) science-based policies. Qualitative and quantitative data are complimentary. Qualitative data (e.g. sentiments) are useful to see what citizens' opinions are on a certain problem. Quantitative data	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	The management of this large regeneration is done by a complex set of semi-public or private firms, and there is confusion and lack of trust among many residents. This adds to the potential lack of trust between residents and the large university campus on the other side of the road. Significant improvements to roads or the public realm have to go through	*The Lab needs to engage with the complexity of policy and governance and public services, and look for ways to make this open and transparent to citizens, as far as possible.*

	(e.g. speeds, traffic volumes) are useful to proof a problem exists (or not).	give a better representation of the real situation of the urban environment.	a long process of technical development and budgeting, at a time when local government budgets are shrinking.	
4f) PROCESS				
	Setting up the lab was done by setting up a website and by talking to (formal) stakeholders. Setting up the living lab could have been improved by engaging more with local initiatives and actors. This would have probably reduced the efforts needed to engage people to participate in the living lab. The continuous evaluation using the logbooks was sometimes cumbersome but has proven useful. Perhaps adding benchmarks (perhaps even co-designed by participants) could make it easier to see whether the living lab lived up to the expectations of participants.	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.	Discussion in progress on how to extend the principles of the 3 year lab into a permanent or long-running thing.	*Overall the Lab will be most successful by full engagement with all the forces and factors in the area – social, economic, environmental, political, cultural etc.*

9.2 Community and policy learning loop evaluation

	BRU	***VER***	***MAN***
GENERAL ISSUES			
COMMUNITY LEARNING	The results are in line with the expectations, as the participants engaged in open ad constructive dialogues. The participants better understood how traffic monitoring works and why it is necessary.	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.	There is a push from some active residents for improved models: Local dialogues to be convened by local people & enabled / facilitated / recognized by MCC (there may be modest subsidies for this) Community organizers /mentors / convenors / etc, to be enabled & trained with MCC support (e.g. a pilot scheme 'Making a Difference Team': the cost per trainee was around £4000. Different round tables may be needed for different stakeholders (e.g. business, public services etc) but these would all attach to a general local forum. Many such initiatives have been tried over the years, but it seems that the LOOPER was able to catalyse some fresh perspectives and commitment to engage, with the factors of success above.
POLICY LEARNING	The results are in line with the expectations. The open discussion between policymakers and citizens led to a mutual understanding, and to an understanding by policymakers of what citizens would want for a more liveable urban area. This process could be strengthened even further if there was a more active involvement by the policymakers in the discussions and the meeting.	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.	There is a general push and aspiration from stakeholders, towards 'active democracy', collaborative governance etc. Recent discussions at a large stakeholder forum in June 2019 and since, have included: Enhancement of existing models: ward coordination: neighbourhood forums (long history, not always successful). Potential of new & emerging models: Citizens assemblies / participatory budgeting Online platform experience shows can help, with basic things, and/or advanced monitoring & data sources: but it does not substitute for human interaction. Local active democracy / co-governance appears to work best with clear tangible opportunities / problems (i.e.. plans and/or conflicts). Generally stakeholders are looking for ways to enhance an active interface between the Manchester City Council (MCC) & its communities.