



The Responsible Sensing Toolkit: Data transparency applied to an ethical framework for city sensing projects in public spaces.

Paul Manwaring

Co-founder City Innovation Exchange Lab (CITIXL)

1. Define User Cases & Goals

What is the real problem that can only be solved by crowd monitoring?



2. ...

What is the d...



4. Public Engagement & Communication

What communication tools will you use to get them involved?



5. Data Collection & Processing

How will your project collect, process, and store data responsibly?
What data insights does your project really need?

Responsible Sensing Toolkit | Decision Canvas

3. Technical, Legal & Spatial Considerations

Is your project GDPR compliant?



What are the treats and benefits of your crowd monitoring technology?



How does your crowd monitoring project ensure safety and security?



Where will you deploy your crowd monitoring solution and do you have permission?



6. Impact analysis, reflection & evaluation

How will you know your project is a success?



Reflect - Is your Crowd Monitoring Project Responsible and Ethical?



Responsible Sensing Lab

Let's get to work!

http://www.citixl.com/responsible_sensing_toolkit/

Responsible Sensing Toolkit | **The original WHY?**

Five years of learning by doing - generating data in public space

Background (2015-2020)

- 2015- SAIL Amsterdam and the IoT Living Lab and CTO
- 2016- The Amsterdam Arena Smart City Event w/ Tapp
- 2016- Museum Night Hackathon w/ Tapp
- 2017- The City Innovation Exchange Lab (IoT Living Lab, Tapp, and CTO = CITIXL)
- 2018-19 - CITIXL South Korea, Taipei & Boston collaborations
- 2018-19 CITIXL CV testing & Recreational Crowd Study w/ CTO and Marineterrein

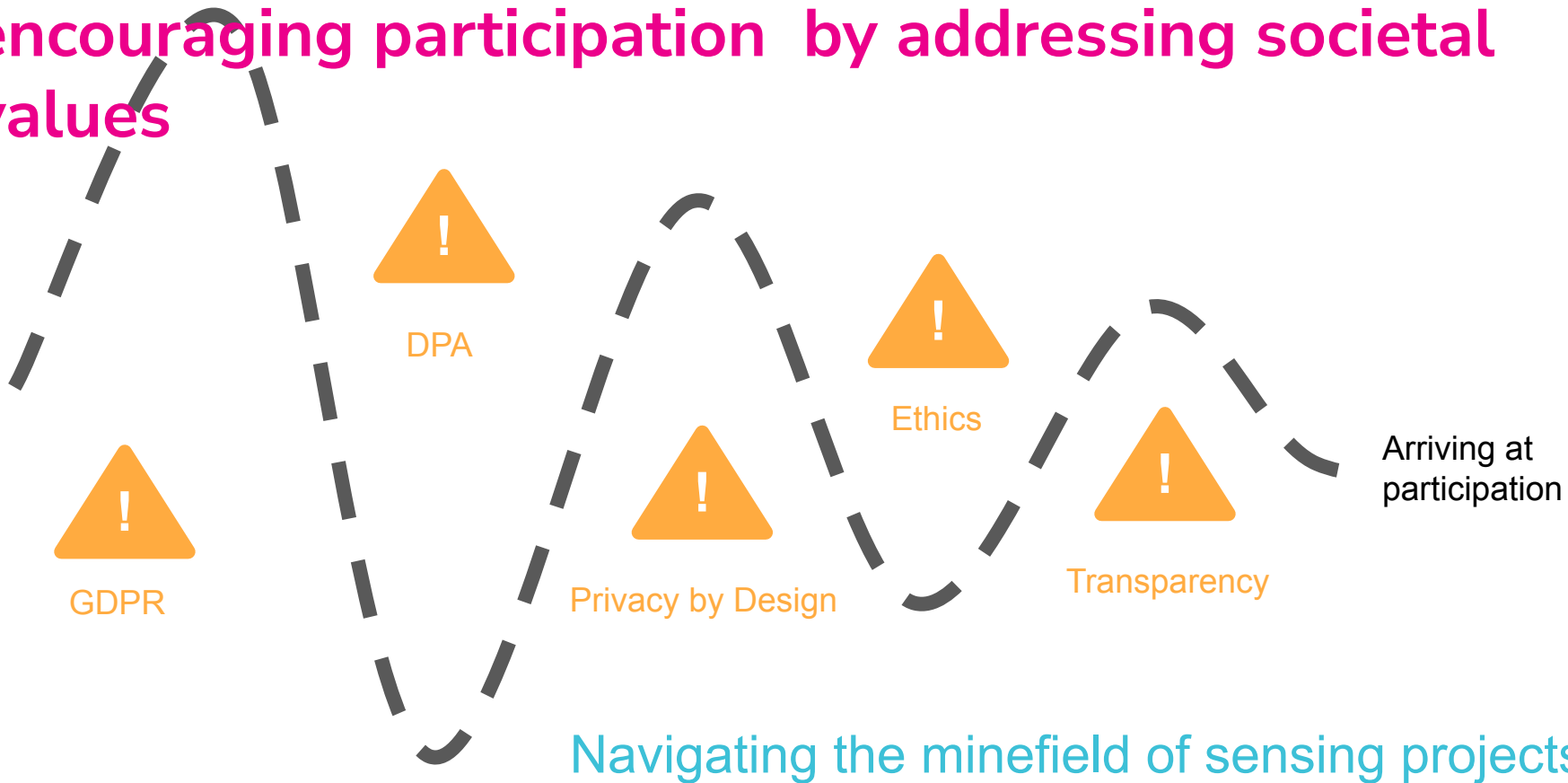
April 2020 the Responsible Sensing Toolkit Phase 1 begins

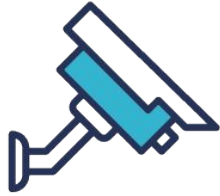
Responsible Sensing Toolkit | **The original WHY?**

Problem: Surveillance vs. Service - How do we gather insights while protecting digital rights?

In public data generating ecosystems, participation is production. With **Data Transparency** the main question is how do we **enable participation?** Not how do we make data available? but **how do we make data useful** while protecting the **digital dignity** of citizens in public space?

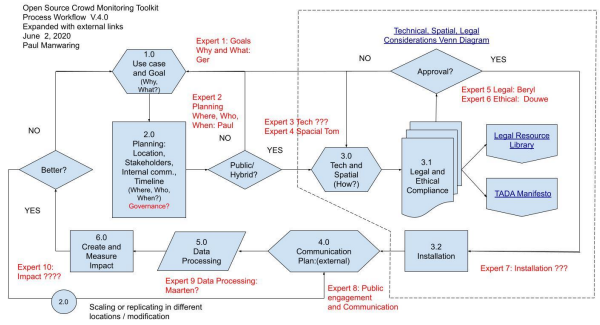
Responsible Sensing Toolkit | Mitigating Risks and encouraging participation by addressing societal values





How was the Responsible Sensing Toolkit developed?

Responsible Sensing Toolkit | **HOW?** From theory to practice



Phase 1 (2020)

- Research / Process / Workflow
- Co-creation preliminary design
- Toolkit v1 ready to validate
- Expert interviews and videos
- Toolkit v2 ready to test
- Publish Beta Toolkit (CITIXL)



Phase 2 (2021)

- Partnership Building
- Workshops, Testing, Feedback, Reports
- Toolkit v3 refinements
- Ready to distribute and scale
- Handover to AMS Institute - Responsible Sensing Lab

Responsible Sensing Toolkit | **HOW?**

The Toolkit was developed by Co-Creation Workshops w/ CTO, experts, and authorities on every topic.



20+
workshops



11 expert
videos



79+
Resource Links

Responsible Sensing Toolkit | WHO?



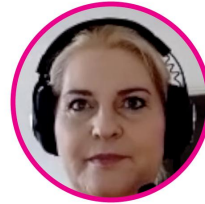
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Lead
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Chief Innovation
Officer
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Markus Pfundstein
Founder & Principal
Engineer
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What is the Responsible Sensing Toolkit?

Responsible Sensing Toolkit | WHAT?



http://www.citixl.com/responsible_sensing_toolkit/

Responsible Sensing Toolkit | Resource Library

Summary

You need to establish **WHY** you are using computer vision technology in public spaces and **WHAT** you want to achieve in order to justify the project legally and ethically.



Questions

Crowd Monitoring can be unnecessarily invasive. Think about how to approach your project with Privacy by Design as a guiding principle and ask yourself questions like:

- What real problem am I trying to solve?
- Is crowd monitoring technology necessary?
- How invasive are these technologies?

[SEE QUESTIONS](#)



Resources

During this stage you should take a close look at these resources that will help you define use cases and establish goals ethically and responsibly:

- Privacy by Design
- Proportionality
- Use Case and Goal Examples

[SEE RESOURCES](#)



Video Library

Visit the video library for expert interviews and advice about defining use cases and goals.

In this section we'll be speaking with the experts:

1. Ger Baron – CTO City of Amsterdam
2. Eelco Thiellier – Project Manager CMSA, Traffic & Public Space City Of Amsterdam

[WATCH VIDEOS](#)

Responsible Sensing Toolkit | **And Data Transparency**

4.2 Public Engagement and Communication Examples



Camera Signage & Registry

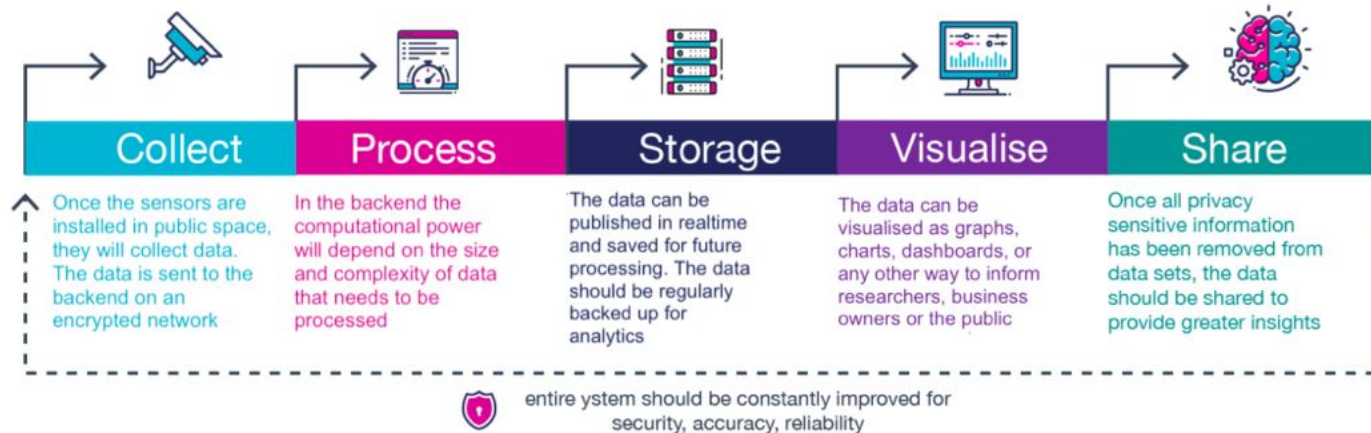
Different cities have different rules and regulations about where and how to display information about sensors in public spaces as well as with what governing body to register these devices. For example, in Amsterdam it is obligatory to register cameras and sensors that are being used in public spaces with the IoT registry and the information is displayed on an interactive map that is accessible to the public

<https://www.amsterdam.nl/privacy/camera'-sensoren/>

Responsible Sensing Toolkit | And Data Transparency

5.2.3 Data Processing

When you are sensing the city, you want to do it responsibly. You want to make sure that your devices are collecting data accurately and safely. You will need to use ISO standards (link?) and make sure you are GDPR compliant. Why you are gathering data in public spaces and what you are doing with it is more than collecting, processing, and storing but also visualising and sharing so it will be used to inform decisions and to create impact for the public good.



Responsible Sensing Toolkit | And Data Transparency

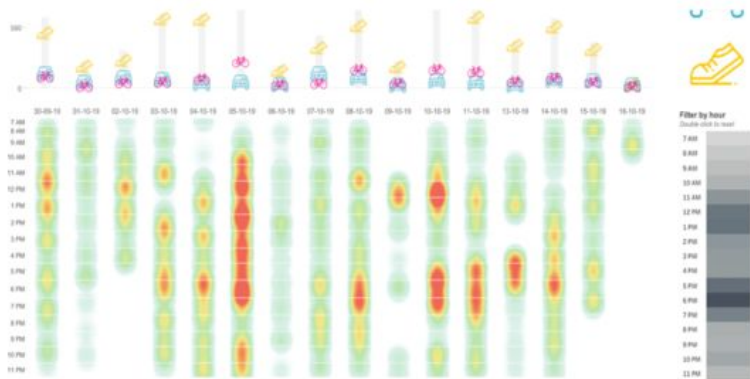
5.2.5 Data Visualisation

Smart Signs

A public information kiosk can use real-time data on 3-D maps or display a simple traffic light design that indicates crowd density so people can make informed decisions in a busy park for instance. This specific example is being tested in Amsterdam at the Marineterrein Living Lab for more information: <https://www.living-lab.nl/projects/open-source-crowd-monitor>



Responsible Sensing Toolkit | And Data Transparency



Dashboards

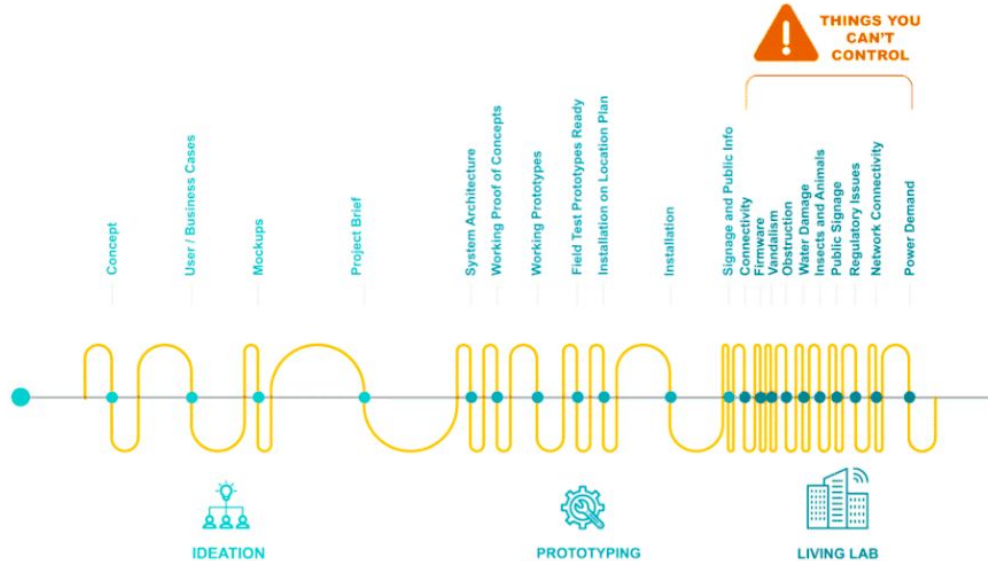
There are many different data visualisation tools like R, Tableau, or Grafana that can visualise data sets. You will need to work with data scientists as well as user interface designers to help tell the story of the data and make it clear how it can help make informed decisions. Here is an example of an interactive crowd monitoring dashboard in Amsterdam. <https://www.mt-dashboard.nl>



Responsible Sensing Toolkit | And Data Transparency

TOP 10 REALITIES OF TESTING IN AN URBAN LIVING LAB

There are many economic, social, and environmental assumptions that can best be validated in inner city Living Lab projects. Once deployed in a living lab however, there are many things that you can't predict. Hereby the top 10 (cruel) realities that can await businesses, researchers, and makers when testing urban technologies in the field. (in no particular order)



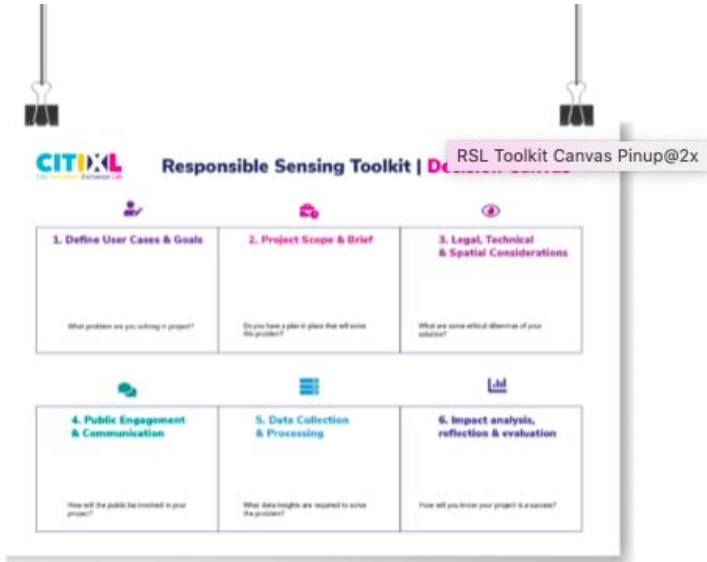
Shuttercam

The Shuttercam project originated based on the notion that people do not know if and when cameras in public space are recording or not.

Read more

<https://www.tapp.nl/top-10-realities-of-testing-in-a-urban-living-lab>







Responsible Sensing Toolkit | Workshops



Workshop 1 – Quickscan

The Decision Canvas:




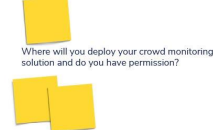



Much like the familiar Business Model Canvas, the RST Decision Canvas was designed to help you and your stakeholders get a comprehensive overview of Responsible and Ethical Sensing projects. Co-created with the input of several experts and field tested with practical projects, the Decision Canvas is a proven tool to get you started.

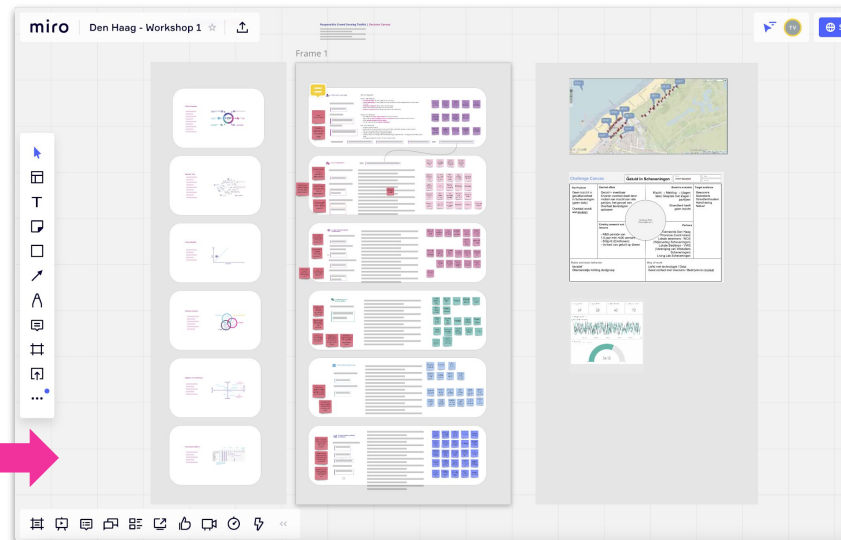
 <p>1. Define User Cases & Goals</p> <p>What problem are you solving in project?</p>	 <p>2. Project Scope & Brief</p> <p>Do you have a plan in place that will solve this problem?</p>	 <p>3. Legal, Technical & Spatial Considerations</p> <p>What are some ethical dilemmas of your solution?</p>
 <p>4. Public Engagement & Communication</p> <p>How will the public be involved in your project?</p>	 <p>5. Data Collection & Processing</p> <p>What data insights are required to solve the problem?</p>	 <p>6. Impact analysis, reflection & evaluation</p> <p>How will you know your project is a success?</p>

Responsible Sensing Toolkit | Online Interactive Workshops



Open Source Crowd Monitor Toolkit | Decision Canvas

1. Define User Cases & Goals What is the real problem that can only be solved by crowd monitoring? 	2. Project Scope & Brief What is the duration/timeline of the project? Who are the project stakeholders and their roles and responsibilities? 	3. Technical, Legal & Spatial Considerations Is your project GDPR compliant? How does your crowd monitoring project ensure safety and security?  What are the treats and benefits of your crowd monitoring technology? Where will you deploy your crowd monitoring solution and do you have permission? 	
4. Public Engagement & Communication What communication tools will you use to get them involved? 	6. Impact alysis, reflection & evaluation How will you know your project is a success? Reflect - Is your Crowd Monitoring Project Responsible and Ethical? 		
5. Data Collection & Processing How will your project collect, process, and store data responsibly? What data insights does your project really need? 			



Working together on the Canvass with Miro

Cases: Den Haag - Sensing noise pollution
NL Police - Safety in public spaces, LUMEN -
Data transparency and participation in arenas.
CC4DR, AMS Living Lab Summit 2021

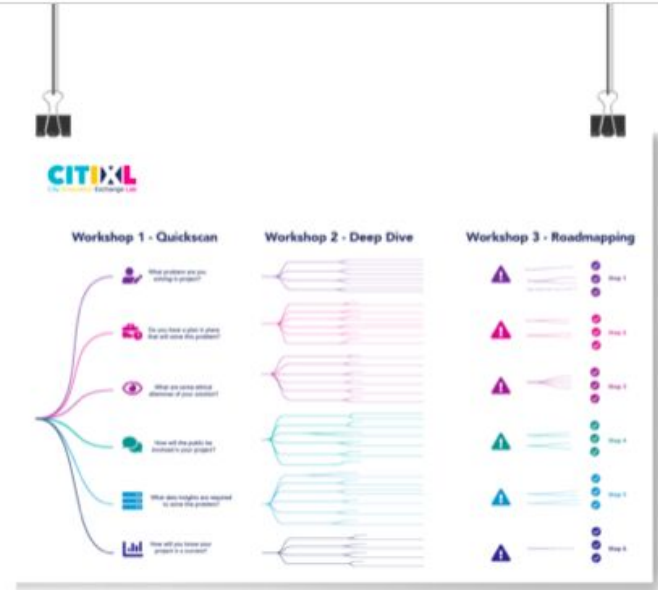
Responsible Sensing Toolkit | Workshops



Workshop 2 – Deep Dive

Identify Attention Points:

After the Decision Canvas uncovers potential dilemmas as stakeholders discuss essential questions for each stage of the six-step-process, We have identified the need to move forward with “attention points”. These become the main topic for a productive workshop where we guide the team to explore paths to resolve these dilemmas with “action points”.



Responsible Sensing Toolkit | Workshops



Workshop 3 – Roadmapping

Define Action Points:

It can be difficult to implement these tools on your own. CITIXL has conducted workshops with dozens of municipal organisations from around the world and, since the Coronavirus, we have successfully created online interactive workshops using a combination of Zoom and Miro Board for a productive and engaging experience. Sign up, tell us what you need and we will help you get started.

Workshop 1 - Quicksan

For each step of the Responsible Sensing Toolkit there is one essential question we must ask. The answer or answers will lead to insights that inform a series of more specific yes/no questions to be addressed in the next workshop.

Decision Canvas



What problem are you solving in project?



Do you have a plan in place that will solve this problem?



What are some ethical dilemmas of your solution?



How will the public be involved in your project?



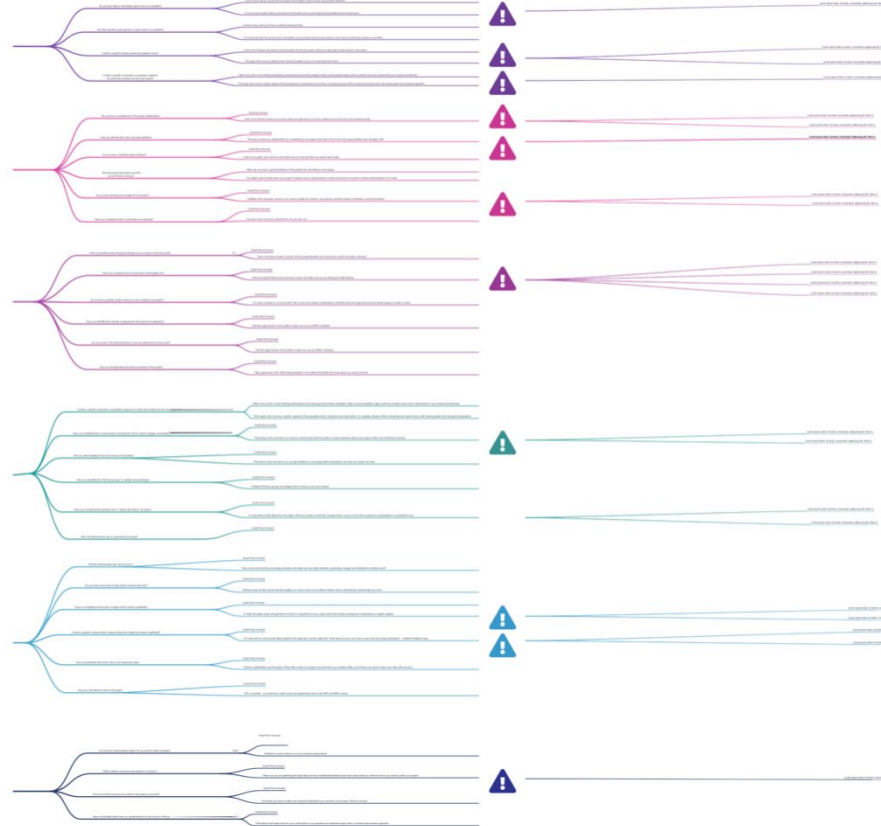
What data insights are required to solve the problem?



How will you know your project is a success?

Workshop 2 - Deep Dive

Based on the insights gathered in the first workshop, the Deep Dive structures specific questions with yes/no answers that will either resolve the issue or uncover Attention Points crucial to a responsible and ethical sensing project.



Workshop 3 - Roadmapping

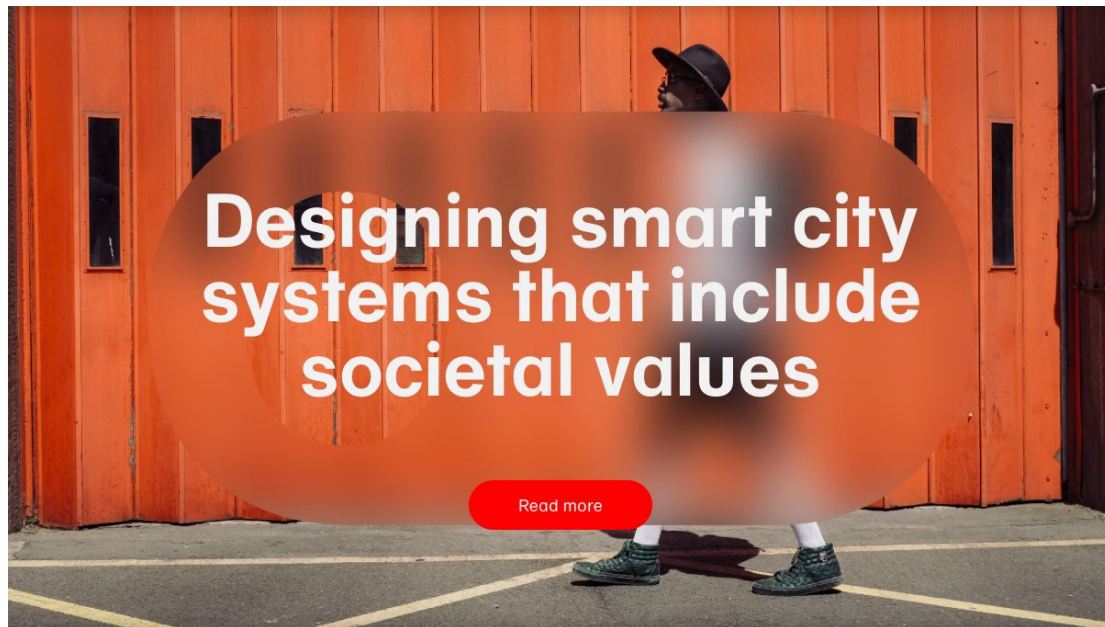
At this point, you will have addressed the issues and dilemmas in a consensus driven format that will inform an effective action plan. Now we begin setting tasks against a clear road map for success.

- ✓ Step 1
- ✓ Step 2
- ✓ Step 3
- ✓ Step 4
- ✓ Step 5
- ✓ Step 6
- ✓ Step 7
- ✓ Step 8
- ✓ Step 9
- ✓ Step 10
- ✓ Step 11

Responsible Sensing Toolkit | CITIXL + AMS

Responsible Sensing Lab

- Workshops & Design Sprints
- Ideation and Prototyping
- Responsible Solutions
- Podcasts and Webinars
- Participatory Platforms
- Urban Living Labs
- Training and Certification



www.responsible sensing lab.org

Mitigating Risks and encouraging participation by addressing societal values

“CITIXL and the RST is changing the view of the police (about sensing projects in public space)”

“The RST workshops have helped us get insights and solutions from citizens who gave us new ideas.”

“In a difficult political landscape we have been able to (with citizens) come up with better solutions.”

- Geert- Jan Staal
Police officer | Member workers council
Dutch Police (Amsterdam)

Tell us YOUR story

**Responsible
Sensing Lab**

www.responsiblesensinglab.org



City Innovation Exchange Lab

www.citixl.com

Toolkit: http://www.citixl.com/responsible_sensing_toolkit

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