WECOUNT

WeCount: Citizens Observing UrbaN Transport

Deliverable 5.2: Summative Monitoring & Evaluation Pilot Report - Leuven & Madrid

Report for:
European Commission
Research Executive Agency (**REA)**

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The WeCount Project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 872743

Document Details

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Description	This deliverable describes the process and results of monitoring and evaluating the engagement process in Leuven and Madrid/Barcelona. As well as outlining the evaluation rationale and the results so far, it describes the methodology used in detail and includes a full evaluation kit. The monitoring and evaluation have been led by Margarida Sardo (UWE), with contributions from Sophie Laggan (UWE), Laura Fogg Rogers (UWE), Elke Franchois (Mobiel21) and Anke Bracke (Mobiel21). The monitoring and evaluation was done in collaboration with the Case Studies, who were responsible for applying the evaluation framework and collecting data.

Version History

Version	Updated By	Date	Changes / Comments
V1.0	M Sardo	12/01/2021	Deliverable draft
V2.0	M Sardo	11/05/2021	Content updated
V3.0	M Sardo	26/05/2021	Integration of comments and content from the WP5 team and Giovanni Maccani (WP2)
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V5.0	M Sardo	23/06/2021	Integration of comments by Kris Vanherle and Giovanni Maccani. Final edits

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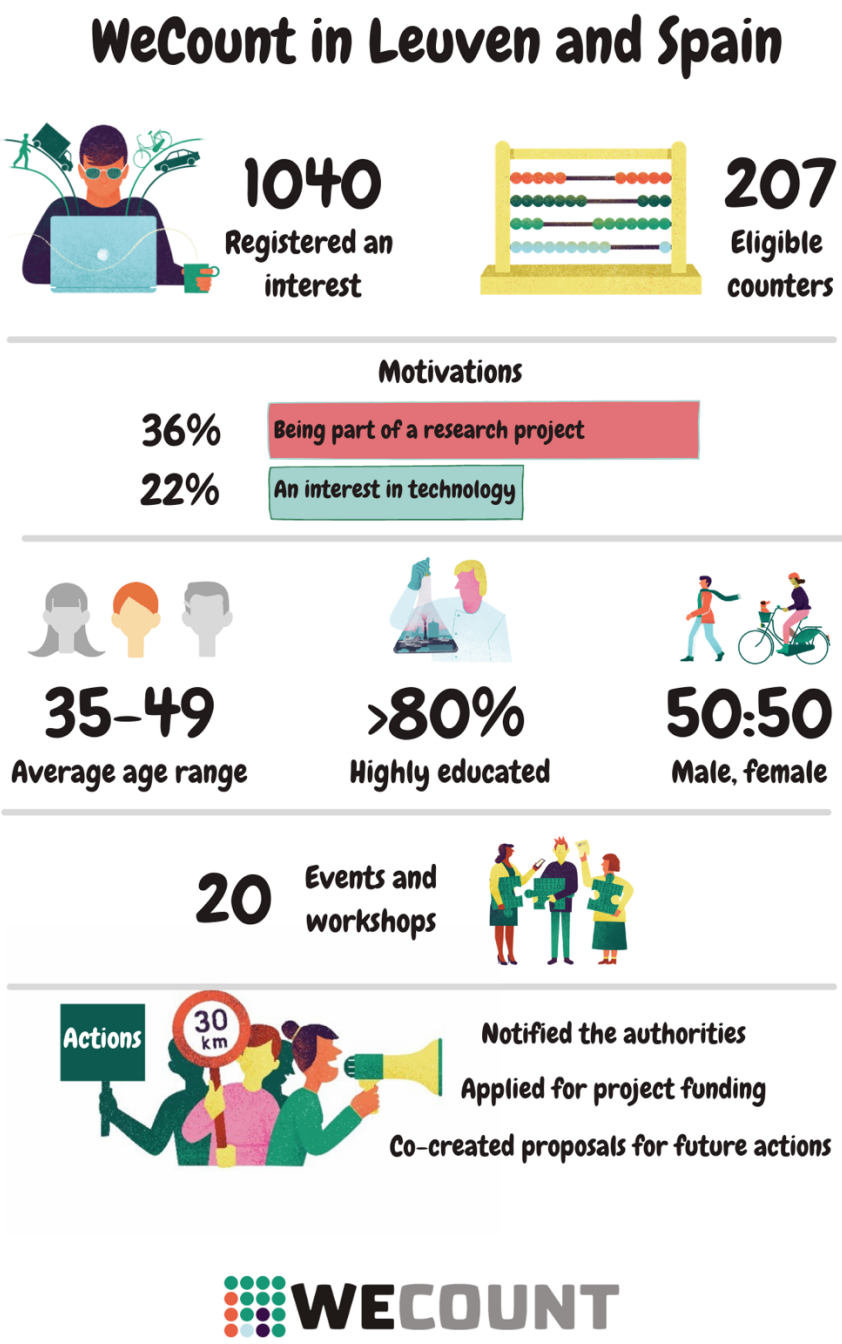

WeCount is a H2020 project which aims to quantify local road transport, produce scientific knowledge in the field of mobility and environmental pollution, and co-design informed solutions to tackle a variety of road transport challenges. Citizen scientists are involved in collecting and analysing the data, and engaging with key stakeholders throughout the process. Uniquely, the project puts mobility data in the hands of residents to empower them to act.

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The project follows participatory citizen science methods across five case studies; these are Madrid/Barcelona (Spain), Leuven (Belgium), Ljubljana (Slovenia), Dublin (Ireland) and Cardiff (UK). The five cases follow a similar execution pathway, with Leuven & Madrid deploying first and serving as pilots for the remaining three case studies.

This report focuses on the monitoring and evaluation of activities in the two pilot case studies, Madrid/Barcelona and Leuven.

A total of **1040 people registered interest** in the pilot case studies, Leuven and Madrid/Barcelona. Of those, **207 were deemed eligible counters**. They were mainly **35-49 years old** (25% of participants in Leuven and 42% in Madrid/Barcelona) and **highly educated** (88% Leuven; 77% Madrid/Barcelona). The majority of participants in Leuven were male (60%) but more participants in Madrid/Barcelona were female (58%). Between the two case studies, there were 179 active Telraams at the time of writing.

Across Leuven and Madrid/Barcelona a total of **20 events and workshops took place**, most of these were online. These events and workshops engaged total of **339 citizens**. Overall, the workshops were well rated by the citizens scientists, who found their input was valued and that their knowledge had been strengthened. **Being part of a research project was the main motivation** from citizens to get involved in WeCount Leuven and WeCount Madrid/Barcelona (36%); followed by an interest in technology (22%). In both pilot case studies actions have been taken such as notifying authorities about traffic speeds and the volume of certain transport modes, using evidence to apply for project funding and the co-creation of proposals for future actions. WeCount is quite an innovative project and overall, despite all the challenges, citizen scientists had a positive, enjoyable and enriching experience.

Running a large-scale Citizen Science project during a global pandemic has been a challenge but one that the WeCount team have excelled at, by very quickly changing and adapting all plans from recruiting and engaging face-to-face to doing it largely online. There is no question that the COVID-19 pandemic severed plans to build relationships with citizens. Other impacts include slower deployment of sensors, additional challenges in reaching low socio-economic groups and impact on the team dynamics. Not only case studies had to deliver the project during lockdown with very strict restrictions for a long period of time, but also had to overcome issues with a technology not yet fully developed. They showed great adversity in adapting to prevailing conditions.

We hope this monitoring and evaluation report proves useful to other Citizen Science and research projects.

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2 Project Summary

2.1 The WeCount Project

WeCount, Citizens Observing Urban Transport, is a Horizon 2020 funded project, part of a Science with and for Society (SwafS) call (H2020-SwafS-2018-2020).

WeCount is a Citizen Science project working across five case studies in Europe to empower citizens to take a leading role in the production of data, evidence and knowledge around mobility in their own neighbourhoods, and at the street level. The project follows participatory citizen science methods to co-create and use innovative low cost, automated, road traffic counting sensors (i.e. Telraam) and multi-stakeholder engagement mechanisms across five case studies.

Citizen scientists in the five case studies are involved in collecting the data, analysing it and engage with key stakeholders throughout the process. WeCount aims at quantifying local road transport (cars, large vehicles, active travel modes and speed), produce scientific knowledge in the field of mobility and environmental pollution, and co-design informed solutions to tackle a variety of road transport challenges. Moreover, the project provides cost-effective data for local authorities, at a far greater temporal and spatial scale than what would be possible in classic traffic counting campaigns, thereby opening up new opportunities for transportation policymaking and research.

2.1.1 WeCount objectives

- WeCount will advance citizens (and broader scientific) knowledge on traffic counting, transport management and related impacts.
- WeCount will establish a durable ecosystem for citizen science traffic counting and related impacts.
- WeCount will lower the technology threshold to reach a more diverse audience and ensure broader citizen inclusiveness.
- WeCount will demonstrate the diverse potential applications, in five use cases, to tackle five different societal issues related to local road traffic.
- WeCount will achieve meaningful research and local policy change, as a direct result of the evidence collected from the citizen science activities.

2.2 Case Studies

The project follows participatory citizen science methods across five case studies (Figure 1) in Madrid/Barcelona (Spain), Leuven (Belgium), Ljubljana (Slovenia), Dublin (Ireland) and Cardiff (UK). The five cases follow a similar execution pathway, Leuven & Madrid deploying first and serving as pilots for the remaining three case studies.

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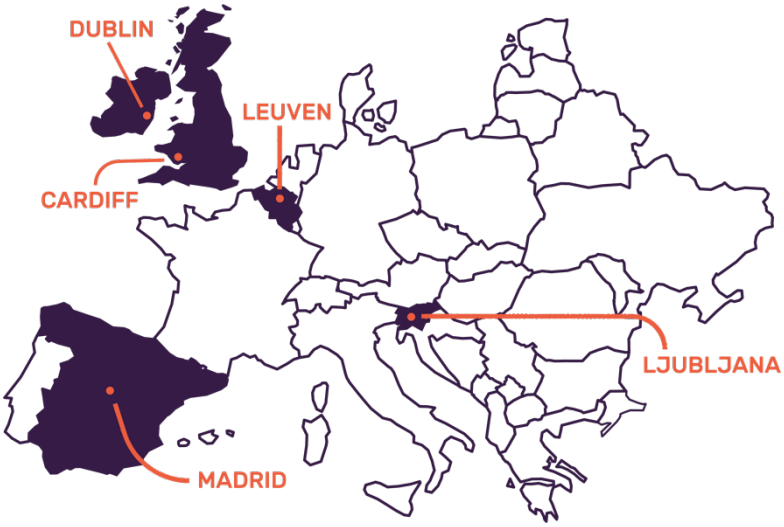

Figure 1 - The initial five WeCount case studies.

2.2.1 Leuven

As one of the two pilot case studies in WeCount, the Belgian case in Leuven started in January 2020 and engagements were carried out for a little over 12 months. Consistent with the citizen science approach in WeCount, participating citizens had, have and will take a proactive role across all phases of the case study, from its problem formulation and co-design, through data collection and data analysis. The last phases are still ongoing while writing this report.

The community building process of WeCount in Leuven was based on previous participatory processes, initiated by the local government or by citizens themselves (e.g. the platform "Maak het mee" (Help us build Leuven together)). Steps were taken to gain a good understanding of the local mobility context, and build on this process. Comprehensive stakeholder mapping was created for each city district. Stakeholders included city officials who supported these active citizens and citizen networks, and were seen as critical players in the community building phase. In addition to a press release, more in-depth communication channels and materials were used to engage local communities (e.g. announcements on Telraam social media (Twitter & Facebook)). COVID-19 restrictions worked against active enrolment of local champions (e.g., for the Kessel-Lo Zone) and recruitment, briefing, and motivation of the local champions had to be done entirely digitally. Once recruited, each counting citizen received a welcome pack, containing the Telraam, instructions and promotional material, which was either delivered or collected at outdoor pick-up events. Early on in the project, before Lockdown, citizens co-designed a Telraam platform where citizen scientists can find tools to: analyse the data, understand the data analysis, build context around the data, initiate dialogue between citizens about the data, and empower citizens to act based on the data. This platform was available for all citizens involved in WeCount. Reaching low socio-economic groups was an important focus in WeCount, especially in the scoping phase and in the data awareness and legacy phase of the project, with effort made to connect with organisations working with such groups.

The WeCount project did not start from scratch in Leuven, since it had been the pilot site of the Telraam technology since Spring 2019. This meant there was already some public record of the Telraam devices, and of the citizen engagement around it both on the level of the public as well as at the city administration.

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WeCount Leuven used five different sub-networks, for the five different city sub-municipalities in Leuven (Figure 2), each with its own story, timing and objectives:

- **Kessel-Lo**: an extension of the pre-existing Telraam network. The goal here was to reactivate non-active Telraam members with the aid of local champions, gathering input, data, and engagement for the incumbent development of the Mobility Plan for this sub-municipality.
- **Wijgmaal**: to gather input for the drafting of the Mobility Plan for this sub-municipality, engaging citizens about mobility based on the data from Telraam with a special focus on the commitment of citizens in data interpretation and local action.
- **Leuven inner city**: to monitor impacts of mobility measures taken as a result of COVID-19 and the Mobility Plan with a strong focus on involvement of vulnerable groups by working with local community centres.
- **Wilsele-Dorp**: to monitor impacts of the planned mobility measures of the Mobility Plan.
- **Heverlee**: at the time of writing, this network was just starting up, not generating sufficient input for the evaluation at this point.

Figure 2 – Map of the five Leuven sub-municipalities.

2.2.2 Madrid and Barcelona

As with Leuven, the Spanish case study commenced in February 2020 and engagements were carried out for more than 12 months. Consistent with the citizen science approach adopted, participating citizens have assumed a proactive role across all phases of the case study, from its

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problem formulation and co-design, through data collection and analysis, until planning and implementing the resulting actions informed by the case study's outcomes and experiences.

It was decided to expand the Spanish case study and extend the effort to the cities of Madrid and Barcelona. As a first step, a beta pilot was conducted with community champions through three online workshops and continuous engagement during the short data collection period performed. In parallel with the beta pilot, the partner developed and deployed an online survey in the initial exploratory phase to meet the objectives. In all phases of the local case study in Spain, significant efforts were made to understand the stakeholder ecosystem, target relevant actors, and engage them at different levels. 66 community organizations in Madrid and Barcelona were identified and approached and public and private sectors were engaged. Schools and academic institutions (primary, secondary, university), for instance, were an important target group for the case study, with several school's lessons delivered to raise awareness of the wider issues covered by the project and encourage participation in WeCount. Three face-to-face interactions were also organized, when restrictions allowed, to further encourage participation. The core of the scoping and co-design process within the Madrid and Barcelona case study involved engaging citizens in participatory online workshops where participants gained an awareness of citizen science, urban (sustainable) mobility, as well as technical knowledge. Community building and outreach has been a challenge for multiple reasons. The main reason was the difficulty in finding people eligible to hang a Telraam sensor on their window. The design of building in Madrid and Barcelona is much different from Leuven, with balconies blocking the view from the sensor, for example. Only a limited number of people met all the requirements. The challenge, therefore, was to involve and engage people in the WeCount project without being able to participate with a traffic sensor. In addition, the current COVID-19 pandemic also played a major role (all activities online etc.). To tackle these challenges, the local team run a successful campaign, and, as a result, participation expanded through the deployment of 1,000 air quality biosensors (i.e. strawberry plants). A diverse community of citizens, stakeholders, and institutions was established, spanning different age groups, genders, interests, concerns, motivations, other demographic characteristics, as well as differing levels of digital skills and subject knowledge. Details on activities undertaken in Leuven and Madrid/Barcelona can be found in "Deliverable 4.1: Summative Pilot Report – Leuven & Madrid, Part A and Part B".

2.3 COVID-19 pandemic

Just as the WeCount project started recruiting citizens and running workshops, the world was hit by the COVID-19 pandemic, which meant restrictions on who we could meet and where we could meet them. Eventually, all WeCount countries went into lockdown, which placed additional challenges on delivering the project as it was originally planned.

The COVID-19 pandemic is, to this day, ongoing and continues to place additional challenges on projects. WeCount was able to adapt quickly to the new restrictions and limitation, but nonetheless the project has been impacted by this global crisis. The impacts of the pandemic on WeCount were the subject of a small-scale research project led by the WP5 Lead and are described in detail in the report "**Impact of the COVID-19 pandemic in delivering Citizen Science projects: Insights from the WeCount project"** (available on the WeCount website). In summary, the main impacts on WeCount can be seen in Table 1.

Table 1 - Overall impacts of the COVID-19 pandemic on the WeCount project.

Impact on	Context/explanation
Deployment	Deployment of case studies was spread out over a longer period of time as everything took longer during the pandemic. More specifically, getting sensors to participants under lockdown was very challenging. This has resulted in at least a 2-3 months delay in the execution of the project and a lower amount of sensor deployment than planned.
Reaching low socio-economic groups	This proved even more challenging in the online environment as these participants struggle to access technology, etc.
Recruitment and engagement	Moved recruitment and engagement to an online environment, with very few exceptions. The citizen engagement strategy had to be re-designed completely.
Geographic areas	As a result of a slower deployment, challenges in recruitment and an online-only environment, some case studies expanded the geographical area of recruitment to be able to target more participants.
Engagement tools	The Consortium also had to make a collective effort to re-orient the focus to the development of engagement tools to an online format (webinars, instruction videos, etc.).
Team dynamics	It was more challenging to manage a large project due to the restrictions imposed by the pandemic. For example, the usual annual face-to-face consortium meetings had to shift online, limiting the opportunity for 'coffee break' problem solving and strategic coordination.

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3 Evaluation Rationale

The Monitoring and Evaluation strategy is based on the Monitoring and Evaluation Framework D5.1 and aims to examine whether the Objectives and Goals set out in the WeCount Dissemination and Communication Strategy D6.1 and the Overview of WeCount communication activities D6.4 have been achieved, in particular referring to the Research Objectives listed above.

3.1 Researchers and public engagement with research

WeCount sits within a global context for public engagement with science and technology within the science communication field (Davies, 2013). Worldwide, there is continuing encouragement (funded and policy driven) for more researchers to engage with the public around their research (Poliakoff and Webb, 2007). The UK National Coordinating Centre for Public Engagement (NCCPE) defines public engagement thus:

> *Public engagement describes the myriad of ways in which the activity and benefits of higher education and research can be shared with the public. Engagement is by definition a two-way process, involving interaction and listening, with the goal of generating mutual benefit.*

WeCount has also been designed to fulfil the principles of upstream engagement, outlined in the EU 'Responsible, Research and Innovation' toolkit (RRI, online) as:

> *Doing science and innovation with society and for society, including the involvement of society 'very upstream' in the processes of research and innovation to align their outcomes with the values of society.*

As mentioned, five partner case studies are directly involved in shaping the project. Citizens can get involved through multiple workshops (educational and informative, co-creation workshops, etc.), data analysis and policy workshops and activities in local schools. In addition to these activities, citizens can also get involved through other communication channels such as WeCount's website, LinkedIn group, newsletters, etc.. This Evaluation deliverable explores how successfully WeCount has been in reaching out to a diverse audience, what changes or impacts can be detected in their knowledge on traffic counting, transport management and related impacts, as well as their sense of empowerment following involvement in the project.

This deliverable focuses on monitoring and evaluation in Madrid/Barcelona and Leuven, the two pilots. Due to ongoing impacts of the COVID-19 pandemic, the following data/results will be included in D5.4 Final Monitoring and Evaluation Report (due November 2021):

- Helpdesk feedback
- Interviews with Case Study leads and staff (research question five, see 4.1.2)
- Outcomes from data analysis workshops in Leuven (planned for in-person delivery when conditions allowed)
- Updates from the community networks, including any follow-on actions taken by citizens or case study teams since this report

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- Statistical analysis to observe any significant changes experienced by participants across the five case studies

3.2 Learning about traffic counting and transport management

Raising awareness of transport management is a broad aim, and as such the Dissemination and Communication strategy (D6.1) outlines how 'learning' about traffic counting and transport management will be central to WeCount communications. Learning is a concept described in the Informal Science Learning literature and outlined in the 'Generic Learning Outcomes' (Arts Council, 2019), whereby learning may involve the development or deepening of skills, knowledge, understanding, values, ideas and feelings. These impacts are measured across five core domains:

- Attitudes and Values
- Knowledge and Understanding
- Enjoyment, Inspiration and Creativity
- Skills
- Behaviour and Progression

Evaluation of the WP activities attempts to measure the impacts of the WeCount project across these domains, for all identified audiences.

3.3 WeCount participants

The WeCount project aimed to engage with a wide range of people. Below we outline the project's main audiences:

Counting Citizens

Citizens that are counting traffic or speeds in WeCount. They might have a sensor at their window (Telraam or another sensor), a strawberry plant or do manual counts.

Involved Citizens

Citizens that are involved in WeCount but do not count. They may take part at WeCount events, subscribe to the newsletter or have applied for a sensor but were not selected.

Local champions

Citizens that support their local network, host meetings, organise events, etc., to build momentum in their communities. They may or may not be counting.

Local stakeholders

Stakeholders, policy-makers, neighbourhood workers, 'Techies', teachers, etc. Everyone that was identified in the local stakeholder mapping and is involved in WeCount in a more strategic capacity.

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3.4 WeCount Events

The WeCount project organised different events, led by WP2. Below we outline the format of these events:

Co-design event

Co-design events aimed to work with citizens co-create a suitable data collection protocol and to co-design of the project governance structure relevant to that community. After this event, the data collection campaign is ready to start.

Kick-off recruitment event

Kick-off events happened after to the co-design event. The aim was to inform the target groups about the project and to recruit participants more broadly.

Kick-off Telraam workshop

The kick-off workshop was the event where all selected participants for a Telraam were invited to participate. During this workshop the participants received information about Telraam as a tool, the data, as well as how to install the Telraam at home.

Data analysis workshop

This was the final workshop in the WeCount process. All stakeholders (participating citizens, involved citizens, local champions, local policy-makers & stakeholders, professionals, techies etc.) were invited to participate. The aim of this workshop was to analyse the data with the citizens, showcasing practical examples on how to use this data, and thus empowering them to interpret and use the data on their own in the future.

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4 Evaluation Strategy

4.1 Methodology

Evaluation is a process that takes place before, during and after an activity. Formative evaluation allowed our researchers to adapt to meet the needs of audiences, while summative evaluation assessed the quality of the activity being delivered, the delivery process itself and what impacts, if any, it had on the participants. Evaluation during engagements allowed citizens to contribute to the collective story of their network, stating their motivations for joining and shared issues of concern. In this sense, engagement during activities helped with interactivity and community cohesion.

Monitoring and Evaluation have been crucial to understand if the WeCount aims and objectives are achieved and to critically reflect on the activities and delivery processes. This report has the potential to be used to improve activities, better plan future events and to demonstrate achievements.

4.1.1 Ethics Approval and Participant Consent

Ethics Approval was achieved through an application to the UWE Bristol Faculty Research Ethics Committee (FET 20.02.034). Informed Consent was achieved before taking part in all evaluation activities. All activities in this project have been determined as low risk to the researchers and participants. The main risks identified for participants are found in the time commitment involved, and in providing personal data. As such, all participants were warned about these commitments, with appropriate informed consent measures taken to ensure the participants were aware about their involvement before volunteering.

The Participant Information Sheets and Consent Forms used are included in Appendix 1. All documents were translated into the local languages. For children under the age of 18, class teacher consent was obtained, as required and in keeping with national law. A letter was also included for the parents/guardians of those pupils, again detailing the project and activity, asking them to inform the named teacher should they not wish their child to be involved. Consent by 'opt-out' is standard practice, especially when activities are relevant to the school curriculum, and when the individual children cannot be identified.

The WP leads were responsible for enacting the consent procedures outlined in this document. All personal data was managed in accordance with the **WeCount Data Management Plan D1.2**. Compliance with Article 39 of the GA and the General Data Protection Regulation (GDPR) with regard to the processing of personal data and on the free movement of such data will be guaranteed. We have ensured compliance with data protection frameworks in all countries in which we process data. If the data processing has taken place in Non-EU countries, it has been compliant both with the National Law and GDPR. Data has been protected to ensure no sensitive data is released that can be linked to specific individuals or entities. Any data which can be identified to individuals or entities has been stored separately to their research responses to ensure confidentiality.

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4.1.2 Research Questions

A variety of methods were used to evaluate the individual events and activities and the project overall. The evaluation methodology was designed to collect high quality data in an easy and straightforward way that works for all partners and across case studies, focusing primarily on the partners and surveys for citizens. All evaluation methodologies attempted to answer the following research questions, which cut across all the WPs.

Objectives/Research questions:

1. Are we engaging citizens who provide meaningful representation of local populations (gender, social deprivation, education, income etc.)?
2. Are the tools/technology sufficiently robust, yet engaging and simple to use?
3. Are the data generated and the engagement activities being used by citizens themselves?
4. Are new WeCount communities emerging that are self-sustaining with minimal central support?
5. How has developing and running a citizen science project impacted on the research team?
6. How can we optimize recruitment, engagement, monitoring and evaluation of future citizen science mobility projects?

4.1.3 Research Methods

A variety of methods were used to monitor and evaluate WeCount. Methods were selected based on how appropriate they were and how practical they were to be used by case study leads, across five different countries and several languages.

WeCount project participation

The project registration process included informed consent approval, plus some demographic, attitude and expectation questions, which were collected whenever a citizen decided to register interest in having a Telraam on their window. This informed consent also enabled anonymous data to be gathered from the Helpdesk, social media, and email queries.

4.1.3.1 Online surveys

Online surveys are a convenient method to gather participants' views and thoughts about events and activities. By using online surveys, we would not take away the participants' attention from the activities they are engaging with. In addition, online surveys take away the pressure of being interviewed, making participants more comfortable (Couper et al., 2002) and eliminating interviewer-bias.

For WeCount participants, a final online survey was design to be relatively short (10 minutes), quick and easy to complete with both open and closed questions, to ensure a variety of data was collected. However, the majority of questions were of a closed format, as this is more inclusive for a variety of different participants (De Vaus, 2002). Including more closed questions than open ones also assisted in making translation and data analysis straightforward. Open-ended questions, meanwhile, allow participants to provide answers in their own terms (Grand and Sardo, 2017) but were kept to a minimum, since they tend to have a lower response rate (Groves et al., 2004).

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Online surveys were originally prepared in English and then translated by local case study teams. They were distributed to participants in their native languages. A final, more in-depth survey was sent to all WeCount participants shortly after their last workshop or interaction with the project/project team.

A copy of the online survey is included in Appendix 8.5.

All data from the surveys were translated to English by a translation and transcription company/service. For the analysis of the final survey, six steps were taken for each case study city. First, the raw data was cleaned and closed questions coded in excel. Second, the open questions were given an initial review to identify and code themes (Braun and Clarke, 2006). Next, the quantitative data were transformed into graphs (in Excel) and the researcher began to write the emerging data story. Following this, the cleaned excel was imported into NVivo for a deeper analysis of content and themes. Themes were then condensed and the dominant themes interpreted for meaning and added to the data story. The sixth step, relational statistics, will be performed to see how certain themes relate, if at all, to demographic characteristics and other themes (e.g. knowledge gained and action took, for instance) and the results presented in D5.4.

In addition to online surveys, the Telraam registration process included some demographic questions, as well as a question on motivation to participate, which were collected whenever a citizen decided to register interest in having a Telraam.

4.1.3.2 Interviews and focus groups

Individual and group interviews (focus groups) are described in the literature as a useful evaluation method as they directly access the observations, insights and the experiences of the participants (Tong et al., 2007). In this evaluation, interviews were used to further explore relevant topics, citizens' experiences and any issues.

The individual interview was designed as semi-structured and the schedule included open-ended questions allowing participants to provide answers in their own terms (Groves et al., 2004). The interviews were used to evaluate citizen's thoughts, views and experiences on WeCount. The in-depth interviews occurred over phone or Skype/similar; they were audio recorded and 'intelligently transcribed' (e.g. removing 'ums' and 'ahs') by professional transcribers.

The group interviews (focus groups) were intended to be conducted as part of the in-person workshops to initiate the project. It was intended that participants would be informed that audio recording and note taking would be used, and then were asked open-ended questions about their motivations for participation in the project, including perceptions of the Telraam technology and traffic in their area. This proved slightly more challenging online, with Leuven finding low uptake on their initial focus group (i.e. people remained silent or left). This could have related to the fact rather than incorporating the focus group in the session, they left it to the end by which point people wanted to leave. Due to the low uptake, the team chose to no longer pursue focus groups in their original format. However, they did decide to host online Q&A sessions a week after every online workshop to chat about how it was going, resolve any problems, and keep the community 'alive'. Meanwhile, in Madrid, they chose instead to adapt the focus group so they could ask the questions through interactive activities and a Slido survey.

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The interview data was analysed in NVivo using the process of thematic analysis (Braun and Clarke, 2006), searching for themes that captured patterned meaning across the data. The codes were then refined and accumulated into themes that represented the semantic meaning across the dataset. Secondary analysis was performed with review by WP5 researchers to ensure the themes adequately represented the original data.

Copies of the interview schedule and focus group are included in Appendix 8.3 and Appendix 8.4.

4.1.3.3 Self-reflective Logs

Staff running WeCount workshops were asked to keep a self-reflective log. Self-reflective logs are forms that staff running workshops are asked to complete soon after the event takes place. Having access to the thoughts, views, opinions and post-event reflections of WeCount staff enables triangulation with other evaluation data. A self-reflective log form and guidance to fill it out was provided in advance, with the aim of making it easy and straightforward to use. The self-reflective logs were interpreted in a qualitative way per type of event. Insights were gained into the do's and don'ts of organising each type of event.

A copy of the reflective log template is included in Appendix 8.6.

4.1.3.4 Feedback during workshops

A template was created for all case study teams to capture data from workshops. This data included demographics, efforts to target low-socioeconomic groups and participants motivations for being involved. Within the template there was also space for teams to make notes about the group interactions or results from any ice breaker activities conducted. Processing all this data into pivot tables in Excel resulted in a series of valuable outcomes. This processing was done per pilot city and per sub-case. This allowed for mutual comparison of trends on both a geographical and organisational level.

4.1.3.5 Demographic data

Demographic data was collected either during the workshops or, while participants were registering for a Telraam or for events (e.g. an online pre-registration form like Eventbrite). By collecting demographic data in advance of the workshops, we aimed to make the evaluation process manageable for the case study cities, as well for participants, who would not have to dedicate as much time during the events completing long surveys.

In addition to demographic data, information on number of citizens reached was also ascertained. General monitoring covered aspects such as recording:

- number of participants in all WeCount interventions
- number of registrations on the Telraam website
- number of "likes" on social media platforms

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We used Google Analytics as a passive monitoring tool for WeCount and Telraam website-traffic monitoring, with common indicators such as unique users per day/week/month, session duration, user acquire channels, user retention etc. Demographic data from the registration stage (for Telraam and/or events) was either directly exported from the Telraam dashboard or downloaded by the case study leader. This data was analysed directly in excel.

4.2 Evaluation implementation

A large-scale, international research project such as WeCount needs a monitoring and evaluation strategy and implementation that works across different cultures, levels of expertise and different experiences in evaluation methods Here we describe how the WP5 team implemented the Monitoring and Evaluation framework.

4.2.1 Coordination across work packages

Several steps were taken in order to involve other consortium members, case study leads and other works packages in the development and implementation of the Monitoring and Evaluation framework:

- All case study leads were consulted and involved in developing demographic questions that were appropriate to their cities/regions.
- WP2 (WeCount Citizen Science Ecosystem) and WP3 (WeCount Platform and Sensors) were involved in developing the final survey and interview questions, both targeting citizens.
- During the review and development phases, WP5 has had continuous interactions with WP2 (WeCount Citizen Science Ecosystem) and ethics. This resulted in having Monitoring and Evaluation as an integral part of the WeCount Engagement Framework and Toolkit, which embeds in one single resource, the requirements in terms of data gathering (and related templates) for evaluation purposes and those with respect to ethics approval. This coordination across work packages has been crucial in ensuring a coherent approach for informing and supporting the case studies' implementations.

4.2.2 Training

At several stages in the project, WP5 delivered training:

- **General training session on Monitoring and Evaluation**, delivered in M6, delivered by teleconferencing. The session was planned and delivered jointly by UWE Bristol and M21 and all consortium members were invited to attend. It provided an overview of the purpose of the evaluation, methods used and what each case-study was expected to contribute with.
- **Individual Case Study Monitoring and Evaluation training sessions,** tailored to their experience (if any) and focused on their monitoring and evaluation needs. These sessions provided an in-depth look at the monitoring and evaluation plans, including a detailed methodology and how and when to collect data. All sessions were delivered by teleconferencing.
- **Online survey guidance.** In order to support the local team in disseminating the online survey and getting the best possible return rate, WP5 produced a detailed guide with

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instructions and set-by-step approach on how to distribute the surveys to all WeCount participants.

- **Interviews with citizens.** Interviews with selected local citizens were conducted by the case study teams, in the local languages to allow participants to fully express their opinions and experiences. When needed, case study teams were offered an online training session on how to conduct research interviews. The case study teams were also given guidance and support on how to approach and recruit participants to take part in interviews, as well as how to get a diverse sample of participants.

4.2.3 Monitoring and Evaluation mentor

To ensure an effective implementation of the Monitoring and Evaluation framework, WP5 have created the role of "Evaluation Mentor" role, who provides continuous support across case studies. This role became necessary as close cooperation with every case study is needed to guarantee the successful application of the framework. The mentor guided all local teams through the evaluation plan, following their own local monitoring and evaluation framework. Case studies were provided with the right information at the right time, and supplied with the templates needed to collect evaluation data.

The Evaluation Mentor has worked closely with all case study leads, organising regular meetings, answering questions, highlighting any monitoring and evaluation needs and sending reminders of data that needs to be collected and/or stored. This approach was quite successful, as all case-studies had access to a high level of support.

4.2.4 Ongoing support

Finally, like in other WPs, the WP5 team have strengthened their relationship with case studies and other WP leads with one-to-one support, should the partners need any clarification, help during framework implementation, brainstorming solutions, or providing additional information.

4.2.4.1 Impacts of the COVID-19 pandemic on monitoring and evaluation

When deliverable 5.1: Monitoring and Evaluation Framework was developed and submitted (February 2020) we could not imagine the world would be about to face a global pandemic. The original framework, which outlines the evaluation rationale and sets out the evaluation plan and methodologies, was designed based on the planned face-to-face interaction and engagement with citizens in the five WeCount case studies.

Just as the project started recruiting citizens and running workshops, the world was hit by the COVID-19 pandemic, which meant several restrictions on who we could meet and where we could meet them. Eventually, all WeCount countries went into lockdown, which placed additional challenges on delivering the project as it was originally planned.

Inevitably, the monitoring and evaluation plans had to be adapted to the new reality: the online recruitment of and engagement with citizens.

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Listed below are the deviations from the original 5.1 framework:

- The overall evaluation targeted a smaller number of research questions than initially planned, due to fewer opportunities to collect feedback from participants, as well as online fatigue. During the pandemic and especially during lockdown, people have seen a huge increase in online events and online demands (as well as general life demands), leading to tiredness and eventually lower uptake and participation in the online world).
- Snapshot interviews were not used to evaluate workshops, in an effort not to overwhelm participants with more online demands.
- Autonomous evaluation methods: these were not used in their original form (feedback cards and feedback boards), but were adapted to the online world as much as possible. Online tools such as Miro and Mentimeter were used instead to collect additional feedback during workshops.
- Scoping work: planned scoping work with local residents (e.g. organising events at neighbourhood centres to inform and involve difficult to reach) did not take place due to the COVID-19 pandemic. The local teams had to shift priorities and invest their time in looking for other methods and options to recruit participants, as well as setting up online workshops, which was not initially planned for. Additional time and effort had to be diverted into motivating participants to join the project, as the pandemic proved overwhelming for many people.

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5 Evaluation Results and Discussion

5.1 Technical Outputs

In this section we present some technical outputs from the pilot case studies. The tables and figures below offer an overview of the Telraam activities for both Madrid/Barcelona and Leuven. These outputs were collected through the Telraam's dashboard, which allows the case leader to track all registrations and activities, as well as communicate with participants. It is worth noting that this does not represent the full dataset of participants. In the pilot cities in Spain, many people participated with a strawberry plant that monitors air quality. These were not included in the Telraam dashboard and the technical outputs described below.

In order to understand and interpret the technical data correctly, the terms used are clarified below:

- **Registrations**: people who registered on www.telraam.net/en/register to participate in the WeCount project and receive a Telraam.
- **Official WeCount members**: people that registered to one of WeCounts networks (e.g. Cardiff, Leuven, etc), stating an interest in either volunteering their time or applying for a Telraam. Being a member does not automatically mean they can count traffic. All official members were asked the demographic questions which we analyse below.
- **Telraam owners**: citizens that clicked further than just registering. They actively provided location information, including a photo of where to install a Telraam as they specifically wanted to count. They qualified to receive a Telraam, however, they did not complete the installation process (e.g. their Telraam was never connected to the Wi-Fi and the Telraam Platform) or their installation/registration was initiated, but not finalised.
- **Active Telraams (that counted at least once after registration)**: installed Telraams that have sent data at least once to the Platform via their WiFi network.
- **Telraams still counting**: Telraams that were still counting at the time of the export (April 20th, 2021) form the dashboard of these data.
- **First Telraam installed and counting:** date when the first Telraam in this network was installed and began counting.

Participants whose windows met the selection criteria were sent/given a Telraam. To qualify they needed to be in an area without an existing Telraam and considered by the team as 'strategically interesting'. They also needed to have, among the following, a window with a clear view of the road, free from obstructions (e.g. trees, balconies, shutters) or certain road characteristics (e.g. crossroad, traffic light), a non-encrypted Wi-Fi network, and an electricity plug close to the window.

5.1.1 Leuven

In Leuven (Table 2), 290 people started the registration on the Telraam website. 264 of them completed the registration and 105 qualified for a Telraam in the WeCount Leuven network. In Leuven, 206 Telraams counted at least once and, as of, April 2021, 130 of them are still counting. Please note: within the technical outputs for Leuven, the data from citizens who initiated their Telraam in 2020 or later from the pre-WeCount pilot of Kessel-Lo is also included in the numbers below. These results are considered to be a part of the WeCount project since the pre-pilot participants are a part of the Telraam database in Leuven. There was also some reactivation work of

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the pre pilot participants during the Leuven case. During WeCount, several pre-pilot participants were asked to and supported in re-activating their Telraam when it was not counting anymore.

Table 2: Leuven: number of participants and Telraam users

Leuven participants and Telraam users	Number or date	Percentage
Leuven registrations	290	100%
WeCount members	105	36%
Telraam owners	154*	53%*
Active Telraams (that counted at least once after registration)	119*	41%*
Telraams still counting (April 2021)	95	33%
First Telraam installed and counting	21/03/2019	

*The number of Telraams initiated and number of Telraams counted at least once after registration include people who received their Telraam before the start of the WeCount-project (pre pilot in Kessel-Lo), but only initialised it in 2020.

5.1.2 Madrid/Barcelona

In Madrid/Barcelona (**Error! Not a valid bookmark self-reference.**), the network started with its first Telraam in March 2020. Since then, 750 people started the registration on the Telraam website. Out of those, 87 qualified to install a Telraam and 64 installed a Telraam. 60 Telraams counted at least once and 26 of them are still counting as of April 2021.

Table 3: Madrid: number of participants and Telraam users

Madrid participants and Telraam users	Number or date	Percentage
Madrid/Barcelona registrations	750	100%
WeCount members	87	11%
Telraam owners	64	9%
Active Telraams (that counted at least once after registration)	60	8%
Telraams still counting (April 2021)	26	4%
First Telraam installed and counting	23/03/2020	

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5.2 WeCount Citizen Scientists

Note: For simplicity we have used the following abbreviations: LEU/MAD (survey data); CitizenInterview (data from interview with citizens)

5.2.1 Leuven

5.2.1.1 Demographic data

In Leuven (**Error! Reference source not found.**), **290 citizens** expressed interest in participating in the WeCount project, by applying online via the registration form on www.telraam.net. Of these candidates, the majority came from the inner city of Leuven itself (35.9%, N=104), followed by Wilsele (21%, N=60), Kessel-Lo (19%, N=55), Wijgmaal (18%, N=53) and Heverlee (6%, N=18).

After thorough analysis of these applications for suitability by the WeCount case leaders in Leuven, **105 citizens** were selected to receive and install a Telraam. This selection was based on both residential location (strategically interesting counting locations within traffic network) and visibility from their windows (no obstacles and not too high or low). Of all the selected Telraam candidates (Figure 3), 33% (N=35) are from Leuven-City, 17% (N=18) are from Wilsele, 25% (N=26) are from Kessel-Lo and an equal percentage are from Wijgmaal (N=26). In Heverlee, the selection procedure has not been finished at the time of writing this report. The results for Heverlee will be presented in D5.4.

However, citizens that were not selected to install a Telraam were not excluded from the further course of the project. They did receive the newsletter for example. It was planned that these people would be involved also during workshops, or as local champion etc. Due to COVID-19 there was no option for that.

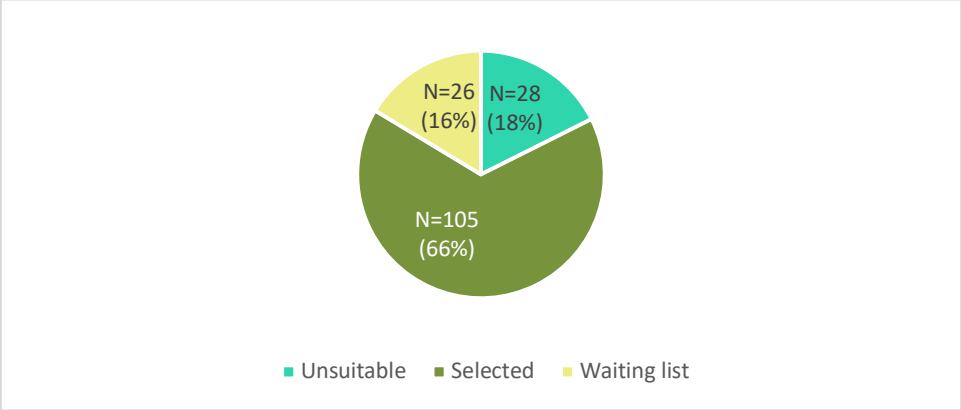

Figure 3 – Telraam selection in Leuven (N=290).

The interest in participating in the WeCount project came mainly from male citizens of Leuven Figure 4. Of those expressing interest, 61% (N=91) who answered the question on gender identified as male, compared to 39% (N=58) identifying as female. The male majority is found in almost every sub-case in Leuven, except for Wijgmaal. 59% (N=20) of those who indicated their gender are female and 38% (N=13) are male. 3% (N=1) identified themselves with another gender or preferred not to answer.

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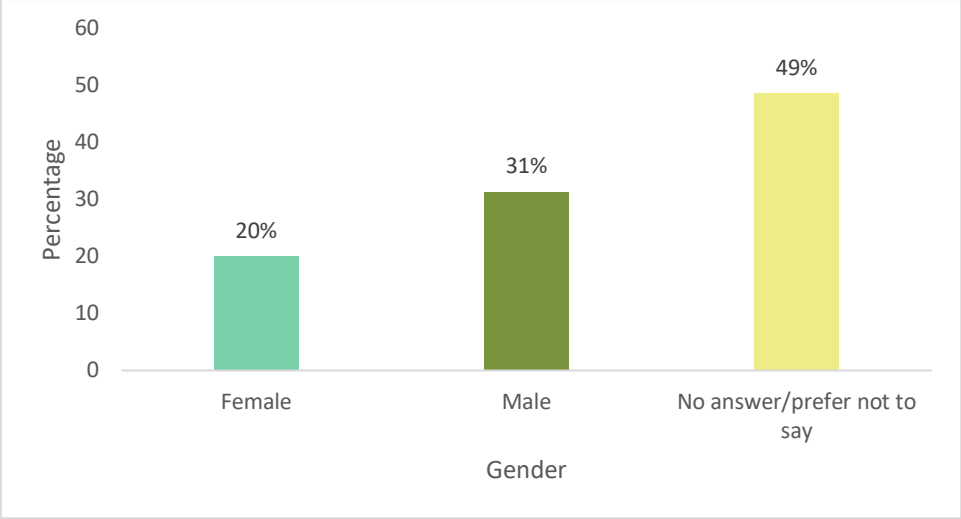

Figure 4 – Gender of participants in Leuven (N=290).

In addition, WeCount has shown to attract mainly residents from **generation X (age 41-56)**. Almost half of the candidates (48%; N=72) who indicated their age is between 35 and 49 years old. This is a remarkably high percentage, considering that only 16% (N=24) are younger than 35 and as many as 36% (N=53) are over 50. This may be due to several reasons. It is possible that the theme of mobility is more prevalent among this generation. It may also be that this generation feels more inclined to participate in citizen science initiatives in general.

Moreover, 11% (N=17) of those indicating their age category within all Leuven subcases are 65 years old or older. Bearing in mind that the elderly may have more difficulty installing Telraam and using the online dashboard, due to typically lower levels of digital skills, this number of engagement is very positive. Older participants are largely concentrated in the Leuven-city network, where 20% (N=10) of applicants indicating their age are 65 years or older. For the other subcases within Leuven, this figure is rather low.

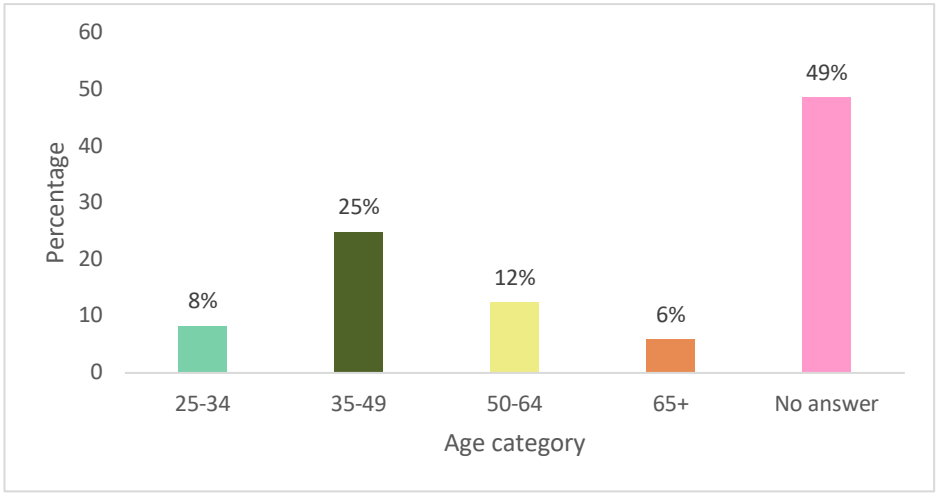

Figure 5 - Age of participants in Leuven (N=290)

As many as 77% (N=135) of all applicants are **highly educated**: 30% (N=44) have a bachelor's degree, 51% (N=76) have a master's degree and 10% (N=15) a doctorate (Figure 6). This trend can be found throughout all subcases in Leuven. It is common knowledge that highly educated people are more likely to get involved in science and citizenship projects. These results not only confirm

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this, but also raise the question of effective ways of reaching out to less educated residents and getting them enthused about being involved in these types of projects.

The age and education results also translate into the employment of the candidates; it is particularly striking that 23% (N=34) are management and 18% (N=27) civil servants. This distribution is also reflected across the subcases in Leuven, with a particular peak of leading personnel (36%; N=12)) and civil servants (30%; N=10)) in Kessel-Lo.

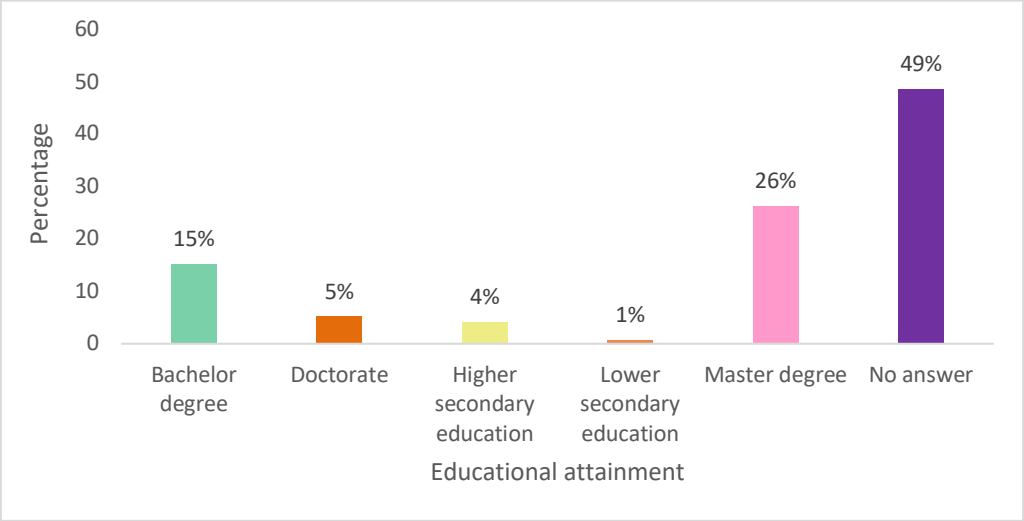

Figure 6 - Educational attainment of participants in Leuven

Finally, in Leuven, ethnicity was not asked at registration. This choice was made by the Leuven case leaders because of the irrelevance for further deployment of the pilot activities. In addition, it is a rather sensitive subject to ask for, which was rather avoided in order to keep the threshold for participation as low as possible.

Upon registration, citizens were also asked their **motivations for participating** in the WeCount project. These responses have been analysed into a set of categories. It is possible that the same participant indicated several reasons to participate. Figure 7 shows the ten main reasons for participation in WeCount Leuven. Of all the reasons (N=298), the main one is to measure the traffic distribution and density (44%; N=131), followed by an interest in improving local (street) liveability (15%; N=44) and an interest in the impact of traffic measures (10%; N=30). Nobody in Leuven indicated that they participated out of a general interest in sustainability. Measuring local noise pollution (0.3%; N=1); a general interest in technology (1%; N=3) and collecting data for education purposes (1%; N=4) also do not appear to play a significant role.

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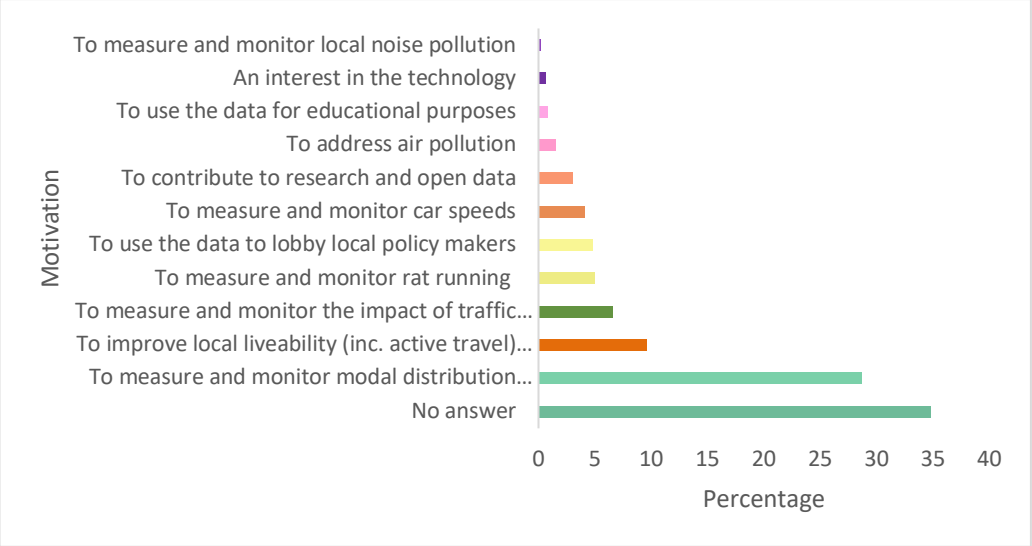

Figure 7 – Motivations for joining WeCount Spain

5.2.2 Madrid/Barcelona

5.2.2.1 Demographic data

In Spain, 750 citizens applied to participate in the WeCount project. Citizens from different areas within the country expressed interest. Given the scope of the WeCount project, only residents in Barcelona (52%; N=377) and Madrid (48%; N=351) were included in this analysis and description, leaving **728 citizens eligible to participate**.

The local WeCount case leaders in Spain **qualified 102 citizens** to receive and install a Telraam (**Error! Reference source not found.**). Of those, 62% (N=63) are living in Madrid, while 38% (N=39) live in Barcelona.

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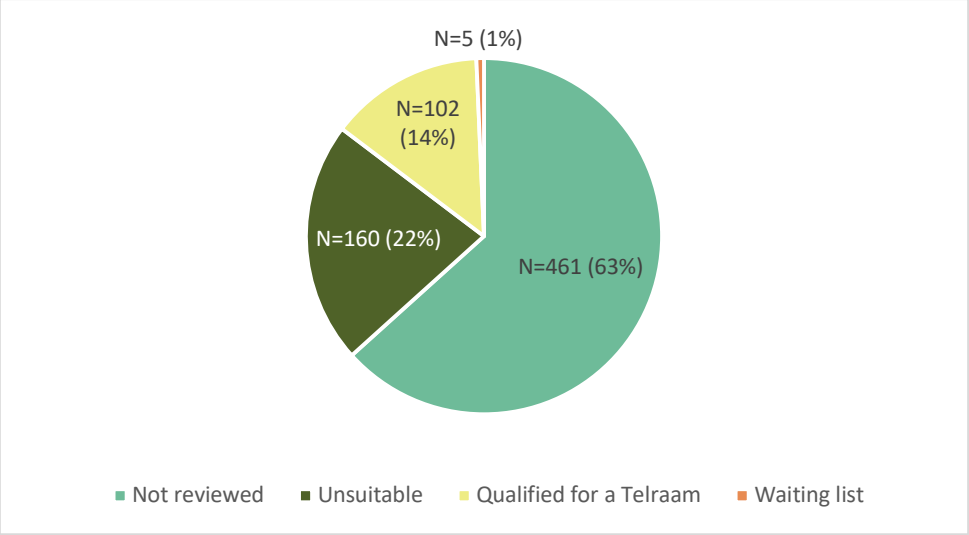

Figure 8 - Telraam selection in Spain (N=728)

Those unable to receive a Telraam were invited to take part in alternative forms of participation based on the interests and concerns of participants. Namely, participants expressed interest in linking traffic data from Telraam with air quality data during preliminary workshops and data collection. This led to a **strawberry plant campaign** called 'Vigilante del Aire1' (Air Watcher). Strawberry plants have been recently investigated and established in the literature as "valid tools for estimating the concentration of ambient particulate matter (PM)" (Van Dyck et al., 2019, p.1) through the magnetic monitoring of strawberry leaves, based on Saturation Isothermal Remnant Magnetization (SIRM) techniques and processes. Overall, 1,000 strawberry plants were distributed (Figure 9), with participants required to place their plant on their balcony or windows for approximately 3.5 months. This was found as an effective strategy to accomplish two critical objectives emerged during the local intervention: (1) to take on board, consistently with the citizen science approach adopted, the will of citizens to combine traffic data with air quality data; and (2) substantially expand the WeCount citizen community to those people that manifested interest but could not host a Telraam sensors as their location did not comply with the requirements. The latter proved to be a winning strategy as the campaign represented a non-invasive, original, and low-effort way to enhance participation in and contributions to WeCount.

[1] https://vigilantesdelaire.ibercivis.es/

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Figure 9 - Air quality biosensors used in WeCount Barcelona/Madrid.

Unlike in Leuven, the interest in participating in the WeCount project in Spain came mainly from **female** citizens (Figure 10). Of those who indicated their gender, 58% (N=109) are female and 42% (N=151) are male. This distribution is similar in both Barcelona and Madrid, with only minor differences.

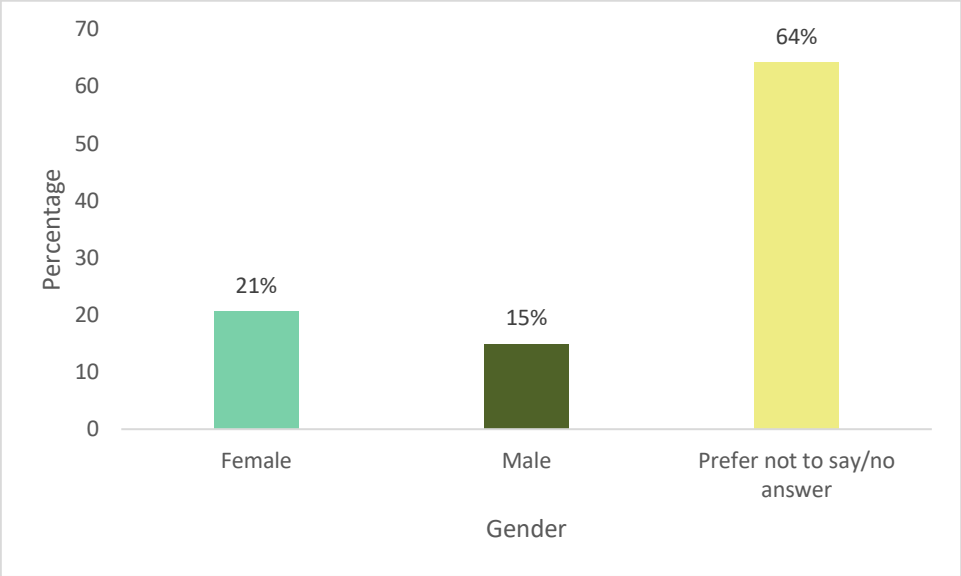

Figure 10 - Gender of participants in Spain (N=728)

In terms of age, 40% (N=108) of the interested applicants in Madrid/Barcelona are aged 35 and 49 and 37% (N=100) younger than 35 thus, the cohort is largely biased towards **generation Y (25-40).** 20% (N=55) of citizens in WeCount Spain are 50 years or older and 4% (N=10) of the applicants are 65 years or older. As with Leuven, lower rates of participation among older generations may be due to fewer digital skills. However, this number is strikingly lower than the coverage of older people (65 years old or older) in Leuven (11%; N=17)). While in Barcelona only 4% (N=6) of young people (between 16 and 24 years old) were reached, in Madrid this number rises to 19% (N=25). Conversely, Barcelona has remarkably more candidates (19%; N=26) aged between 50 and 64 years than Madrid (14%; N=19).

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The majority of applicants in Madrid and Barcelona have a master's degree (40%; N=110), a bachelor's degree (26%; N=70) or a doctorate (9%; N=23) (Figure 11). Together, three quarters of the citizens are **highly educated** (75%; N=203). Similar conclusions from Leuven can be drawn here: highly educated people are more likely to get involved in science and citizenship projects.

In Madrid/Barcelona, no additional questions were asked about employment. There is also no data available on nationality and ethnicity of engaged citizens for the WeCount project, as the case study leaders decided not to ask these questions. They were not perceived as being positively received by participants. In addition, ethnicity in Spain is not a driver for estimating socio-economic level

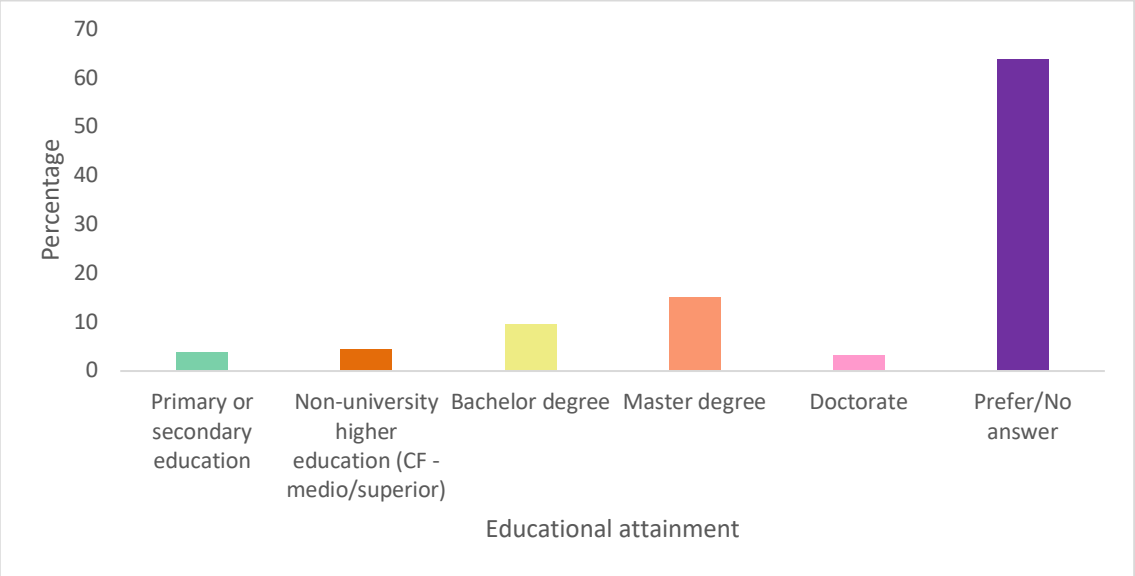

Figure 11 - Educational attainment among Spanish participants (N=728)

Of those indicating their reasons for engagement in the WeCount project (N=330; Figure 12), the main reason is to **address air pollution** (28%; N=92). The second reason for participation is the contribution to research and open data (22%; N=74). A large part of the engaged citizens also participated to measure modal distribution and traffic density in their street (15%; N=51), because they are interested in sustainable mobility in general (9%; N=29) and because they want to measure and monitor local noise pollution (8%; N=26).

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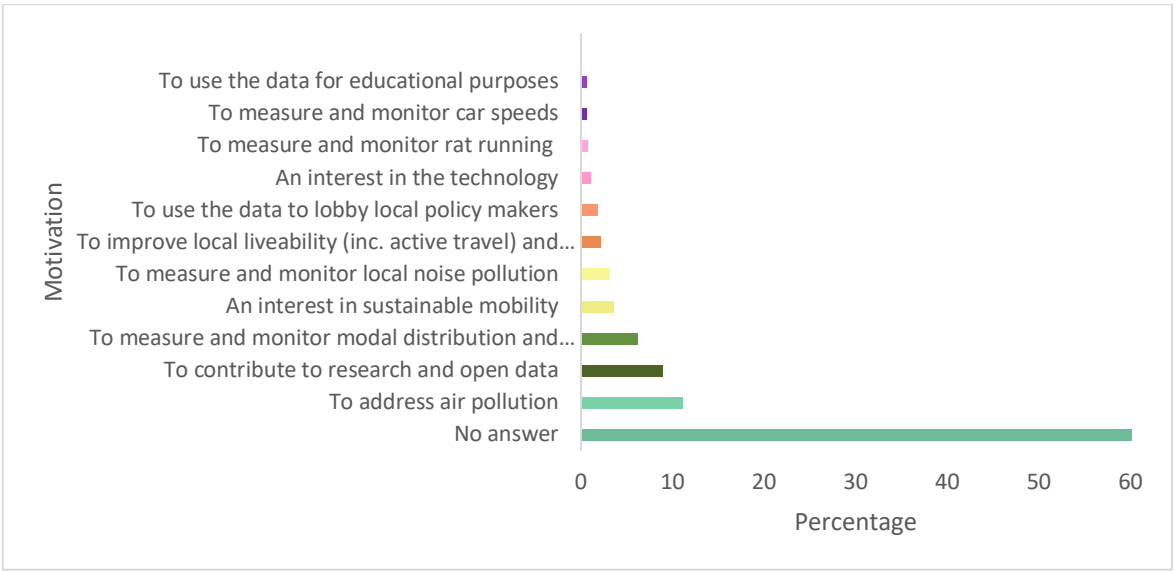
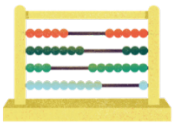


Figure 12 - Motivations for joining WeCount Spain

5.2.3 Summary

	Leuven	Spain
Counting Citizens 	105	102
Predominant gender 	60% male	58% Female
Predominant age 	25% 35-49	41% 35-49
Educational attainment 	88% degree educated	77% degree educated

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5.3 Events and workshops

5.3.1 Leuven

Five **events/workshops** were organized in Leuven to facilitate the WeCount project activities and explain how to install their Telraam. Of these, two were part of the Leuven-City subcase. The remaining three were part of the subcases in Kessel-Lo, Wijgmaal and Wilsele, respectively. One event was a co-design workshop and the remaining four were kick-off workshops to launch the networks and explain on how to install their Telraam devices.

Due to the restrictions imposed by the **COVID-19 pandemic** most interactions have been conducted virtually with little to no face-to-face contact with participants and stakeholders (Figure 13). Particularly in reaching out to and engaging with low socio-demographic groups, which was an important focus in WeCount Leuven, the COVID-19 pandemic has had a strong negative impact.

Figure 13 – One of the few face-to-face events in Leuven (March 2020).

Co-design event

One co-design event took place in Leuven. This event is the only one that happened in a physical location, which was challenging during a pandemic. Likely due to restrictions imposed by the pandemic and fear of face-to-face engagement, only 4 citizens took part in this event. Of these participants, 50% (N=2) were male and 50% (N=2) female. Half of the participants (N=2) were between 35 and 49 years old, the other half (N=2) between 50 and 64 years old. In addition, half of the participants (N=2) were actively involved in the project as participating citizens, while one local champion was also present. One person did not indicate their involvement in the project.

Specific efforts were made to reach participants with **low socio-economic status** for this event. For instance, in Leuven-City the event was organized in a neighbourhood centre, known for being visited frequently by this demographic. To recruit participants, there was active cooperation with a community worker who was in close contact with the targeted group. In order to familiarise participants with the Telraam technology and methods, a Telraam was installed on the window of the community centre before the event. This way, visitors were already given an insight into the

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sensors look and functionalities. Finally, to keep participants engaged during the event itself, an informal event atmosphere was created using simple language and explanations about the Telraam and any expectations for the project, both for the WeCount team and participants.

The event itself covered a broad range of topics, all related to sustainable mobility and the Telraam technology:

1. How does Telraam work and what does it measure?
2. Life stories: how did we end up at this place and why do we/do we not like living here?
3. Where do we travel to? How do we travel?
4. Why do I want to participate in Telraam? (measure speed, monitor future changes in street design, …)

Informal feedback on the workshop shows the main motivation for people to participate in this event was for the social aspect: people indicated their interest in participating in something meaningful and appreciated the opportunity to get out of the house. Participants also indicated a strong interest in traffic-related issues, which is to be expected given the scope of the project.

Although the number of participants was very limited, the event itself was evaluated by the citizens as **4/5** when asked how they liked it. The participants' appreciation of input received a 4.8/5 and so did the provision of information.

Kick-off workshops

Four kick-off workshops took place in Leuven from July to December 2020. They consisted of a physical pick up event of the Telraams in an outdoor location, followed by an online workshop a few hours later.

A total of **72 citizens** participated in the kick-off workshops in Leuven. Although not all participants eligible for a Telraam actually participated in the kick-off workshops, the participation rate was generally quite high (69% of those selected, N=72). This ratio differs strongly between the different subcases within Leuven, and is mainly pulled down by the participation rate in Leuven-City where only 29% (N=10) of the selected Telraam candidates participated in their local kick-off workshop, compared to 81% (N=21) in Kessel-Lo, 89% (N=23) in Wijgmaal and even 100% (N=18) in Wilsele. Details on the demographics of those attending the kick-off workshops can be found in Table 4.

For some kick-off workshops, specific efforts were also made to reach participants from **low socio-economic groups**. In Leuven-City, the same approach was used as the co-design event. This effort revealed specific **digital and geographical barriers** when trying to engage participants with a low socio-economic status. For instance, several Telraam participants were unable to participate in the online workshops after the pick-up meeting because of an unfamiliarity with the Internet or Zoom. In addition, it was not easy for everyone to travel physically to the pick-up location to receive their Telraam.

The events tackled the following questions:

1. Where do Telraam users come from and what are their motivations for involvement?
2. How does Telraam work and what does it measure?
3. How can you install a Telraam yourself?

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Each kick-off workshop in Leuven was well rated by the participants, with overall scores of **4.3/5**. It is important to note that not all participants indicated their scores for the workshops. Poll questions were used within Zoom and not all participants were able to answer these questions, as the installation of the Zoom application is a requirement to see these polls pop up on screen, meaning those joining Zoom on a web browser could not do the polls. In addition, it is also possible that not everyone participated in the evaluation questions out of a lack of interest or digital barriers.

Table 4 – Details and demographic data of kick-off meeting participants.

Kick-off workshops		**Leuven-City**	**Kessel-Lo**	**Wijgmaal**	**Wilsele**
Total number of participants		10	21	23	18
Gender	Female	6	11	11	9
	Male	4	10	12	9
Age	25 – 34	2	0	0	0
	35 – 49	5	0	0	0
	50 – 64	3	0	0	0
	65 +	0	0	0	0
	No answer	0	21	23	18
Project involvement	Participating citizens	6	21	23	15
	Involved citizens	0	0	0	0
	Local champions	4	0	0	1
	Local policy makers & stakeholders	0	0	0	0
	Professionals, techies & local geeks	0	0	0	2
Average evaluation score (on a scale of 1-5)	In general, how did you like the workshop/this event?	4.8	4.4	4.3	4.5
	Do you feel capable of installing your Telraam at home/yourself now?	4.8	4.9	4.3	4.7c
	Do you feel you know everything you need to know about Telraam?	4.4	4.6	3.5	4.4

The combination of a physical and COVID 19-proof pick up event with an online technical workshop to provide instructions on how to install a Telraam worked very well in Leuven. This in-person contact not only potentially increased commitment of the participants but also lowered the

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threshold to interact online during the workshop. Workshop leaders knew everyone by name, and participants got to know the face behind the Telraam network in their area. It created trust and a more informal atmosphere. In addition, it created an opportunity for outdoors interaction among participants during lockdown periods and therefore a sense of community building. When the digital barrier was not a problem for the target group, an online workshop also proved to be quite efficient. Each workshop was organised by two people: a workshop leader and technical support to manage the online chat.

There is room for **improvement** for this approach to the kick-off workshops. Even though the physical pick-up moment offered a great possibility to engage with citizens, it is not the same as a physical workshop. The case study leaders believe that the lack of live engagement with citizens resulted in a lower sense of connection to the project. In addition, cold weather limited in-depth conversations with participants at the outdoor pick-up event since people were not so keen on staying around for long. Reflecting on the online workshop, staff running them in Leuven also indicated the need to work on their format and content. Given the difficulty of the (technical) information being communicated, an online approach requires some extra creativity and structure. In a physical setting, it is easier to show how things work and cover all technical aspects of the sensor. A weakness of online workshops more generally is the risk of technical difficulties such as problems with the application itself or slow internet connections. An online environment also severely limits the possibilities for interaction between both the workshop leaders and the participants themselves. Hosting a fruitful exchange on motivations and citizen engagement for the WeCount project in an online session proved to be quite the challenge, but not impossible.

After conducting several workshops in Leuven, a few **takeaway lessons** have been drawn:

- Technical issues with the online workshop platforms could be limited to ensure maximum comfort and engagement with participants. For example, by explaining to participants in advance how an online session with Zoom (or chosen platform) works.
- Start each kick-off workshop with a short introductory video, followed by more details and tips for installing a Telraam in a smooth way.
- It is important that the same team members who will be hosting the online session attend the pick-up event to build rapport. Because of lockdown(s) and teleworking, this has not always been the case for all kick-off workshop in Leuven. By swapping team members for the online session, consistency and connection with the participants was considerably lower. Even a short opportunity for small talk offers a great base to start a sense of connection which helps when meeting online afterwards.

Local champions

One of the objectives in WeCount was to build self-sustaining networks of citizen scientists through working with local champions. The pandemic made it challenging to achieve this objective in the framework of this project. The WeCount team still believes in this approach but are of the opinion that live workshops and conversations are needed to identify the local champions and to support them in their role as project ambassadors. Similar to Madrid, the 'newness' of the project did not set the right conditions for the project team to entitle citizens as champions – they need to champion something they believe in and this comes with time.

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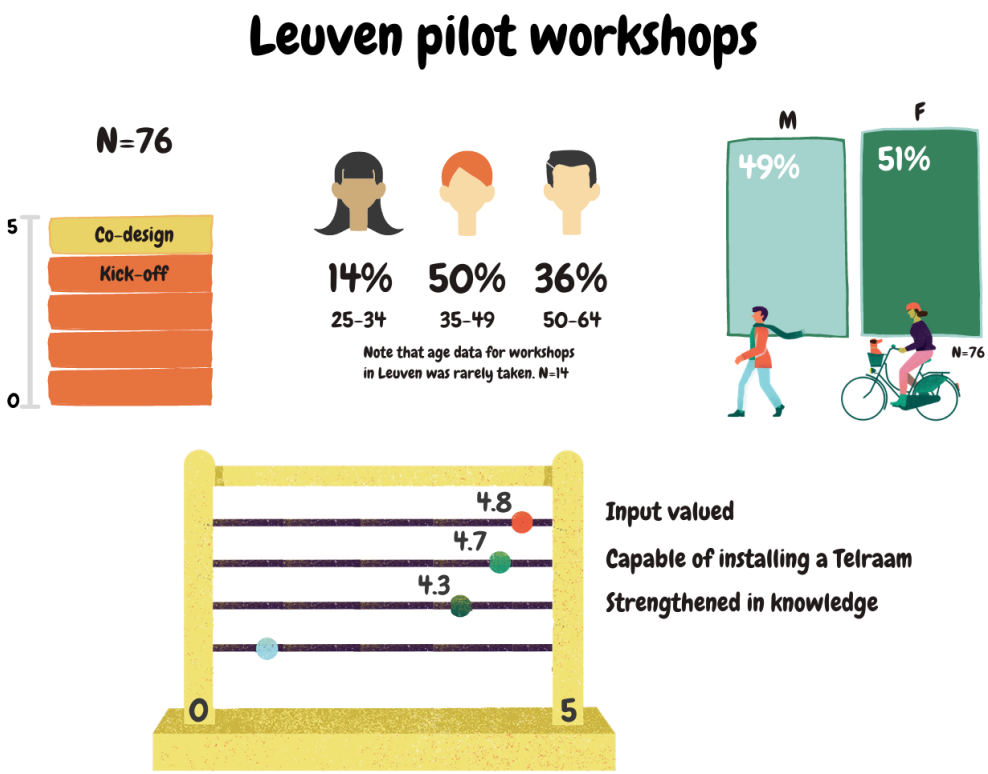
Saying this, the Leuven team took several steps to try and identify Local Champions, with some success:

- At the pick-up a **community engagement tool** was used, inviting participants to reflect on their engagement with the project, going from 'just counting' to 'taking local actions together with my neighbours based on Telraam data'. It was clear that several participants were eager to take it a step further. The local team connected several participants with each other, to support the installation process. These local champions operated on a network level.
- In Kessel-Lo, there was already an established Telraam network. In this network five local champions were identified and participated in online meetings and training. Due to the pandemic, they were not allowed to visit/help others to install their Telraams.
- Other participants were actively involved in the **Telraam Lab**, a co-creational process to develop toolkits for citizen-scientists to initiate dialogue with neighbours and to act on the Telraam data. This process is still ongoing.

Summary of Events and workshops in Leuven



5.3.2 Madrid/Barcelona

In Madrid and Barcelona, **fifteen events/workshops** were organised from 2020 and throughout the duration of the project, to launch the WeCount project, follow up on citizen activities and empower them to use and interpret the data they collected. Eight were co-design workshops, three were kick-off workshops to install the sensor, four were data-analysis workshops, with the final data

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analysis workshop leaning towards action co-creation. Events were split across the two cities, with a final data analysis event organised for participants from both Madrid and Barcelona. A total of 263 participants attended these activities.

Due to COVID-19 related restrictions, which were enforced in Spain throughout the whole period of project activities within the case study, all interactions were conducted virtually with little to no face-to-face contact with participants and stakeholders.

Co-design event

In total, **196 participants** joined the eight co-design events, of which 80 indicated their gender: 43% (N=34) female and 56% (N=45) male. Of those indicating their age (N=102), 37% (N=38) were younger than 24. This is not surprising, as three of the co-design events were organised in and by schools. For this reason, not all demographics data has been collected. Additional details on the demographics of those attending the event can be found in Table 5.

For these events, efforts were made to reach participants with **low socio-economic status** to be as inclusive as possible. The case leaders in Madrid therefore organized part of their recruitment through communication channels used by (and together with) local community leaders, based on geographical area. There was also a strong focus on face-to-face communication where possible, introducing the project activities at physical locations across the cities. Teachers and principals were key contacts for recruiting pupils, and teachers often co-designed the content together with the team and organised the sessions.

A number of topics were discussed during these events, and in general followed the following format:

1. An introduction about citizen science in general and its potential.
2. Getting to know each other; who is participating and their expectations.
3. Introduction and discussion about sustainable mobility, with a specific focus on Urban Feminism and Cities
4. Introduction of the WeCount project, including an explanation of the Telraam sensor, the algorithm, the data platform, the difference between them and compared to other traffic counting techniques.
5. Crowdsourcing the problem: how do participants perceive and experience traffic and mobility today, using the WeCount Traffic Timeline.
6. Closing and next steps, with a collective discussion about the pilot and timeline.

Recruitment of candidates to receive a Telraam. For schools, the content and format were adapted to make it accessible for their age.

Overall, participants rated their participation in the co-design events as 'very good', with an average score of **4.6/5.** Participants also felt that their input was appreciated, and gave it an overall score of 4.5/5. The workshop leaders confirm these results, are reported in their self-reflective logs; people were very excited about the project in general and participated actively when input was asked for. Based on feedback of participants, it became clear that they were mostly interested in learning about the project and the technical functionalities of the Telraam sensor. When working with schools, the learning focus was crucial in order to support their studies. One of the great advantages of working with schools is that the digital barrier is less of an issue. Children are not

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only often more familiar than adults with technologies such as Zoom, but they do not need to worry about timing of the workshop or access to a laptop or computer. The workshop takes place at the school, and everything is set up in advance. In addition, workshop leaders reported that children were also less reluctant to voice their opinions or concerns about the topics being discussed, resulting in an interactive and fun workshop. Finally, it was observed that events with smaller participant numbers benefited the most from online sessions, as it easier for their input and ideas to be taken on board and appreciated.

Table 5 - Details and demographic data of participants in the co-design events. NM = not measured

Co-design event		**Madrid**			**Barcelona**				
Venue		Online (Zoom)							
Number of participants		11	9	4	23	33	17	79	20
Gender	Female	2	3	2	11	16	NM	NM	NM
	Male	9	6	2	12	16	NM	NM	NM
	Non-binary	0	0	0	0	1	NM	NM	NM
Age	< 16	NM	0	NM	1	0	16	NM	20
	16-24	NM	0	NM	0	1	0	NM	0
	25 – 34	NM	0	NM	0	1	0	NM	0
	35 – 49	NM	1	NM	4	2	0	NM	0
	50 – 64	NM	3	NM	2	3	1	NM	0
	65 +	NM	2	NM	0	0	0	NM	0
	Prefer not to say	NM	1	NM	8	14	0	NM	0
Project involvement	Participating citizens	NM	9	NM	0	0	0	NM	NM
	Involved citizens	NM	9	NM	23	33	16	NM	NM
	Local champions	NM	7	NM	0	0	1	NM	NM
	Local policy makers & researchers	NM	0	NM	0	0	0	NM	NM
	Professionals and techies	NM	1	NM	0	0	0	NM	NM
Average evaluation score	In general, how did you like the workshop/this event?	NM	4.7	NM	4.7	4.7	4.4	NM	NM
	Do you feel your input was appreciated?	NM	4.8	NM	4.7	4.2	4.4	NM	NM

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	Do you feel strengthened in your knowledge of the topics discussed?	NM	NM	NM	NM	NM	NM	NM	NM

Reflecting on these events, case study leaders highlighted several challenges. First, even though a large group of citizens expressed interest in the project, the case leaders believe people were initially sceptical about getting involved as they would have preferred to try the technology before deciding to host a sensor. Also, participants that registered an interest for a Telraam but were not successful may have decided not to purse WeCount as they may have felt there was no longer a role from them.

Second, it was challenging to run an online workshop while keeping all participants engaged, especially when dealing with a diverse set of participants. The participants' interests varied widely (e.g. from monitoring traffic for safety reasons near schools, to the technology, noise pollution and urban (re-)design). It was not possible to go into details while accommodating everyone's interests (e.g. talking 10 minutes about the Telraam API would have been greatly appreciated by the people interested in the technological side but not others). The participatory exercise (see box below) proved challenging when done online as most people did not have their camera switched on and the MIRO board used to facilitate the exercise had both practical and technical issues that limited the ability of people to use the tool. Yet, quick on their feet, the event hosts soon asked participants to provide their input verbally or in the online chat, leading to rich discussion.

A participatory method for online engagement

The participatory exercise method, used in lieu of focus groups (see 5.2.2.1 for more information) aimed to gather how people perceive and experience traffic in their street during the day and during the year. It consisted of two online timelines, first of a typical 24-hour period and second of one calendar year. Participants were invited to add their time-specific traffic issues to the first with digital post-its, and after some discussion they repeated the process with the second timeline. This allowed case study leaders to ascertain the main concerns for participants in a fun and engaging way. Some of the concerns raised included: Noise and traffic peaks (e.g. waste collection trucks at 1am, people leaving bars at closing time, construction noise, tourist season), traffic jams in front of schools and main commuting roads, pavements too small to walk along or accommodate mobility scooters, low frequency of public transport during weekends around midday, etc. Also, because of the COVID-19 pandemic, people pointed out the unusual emptiness in the streets and public spaces. On the one hand, as expected, the inputs about traffic during the day varied substantially and most times were very specific. On the other hand, some more general findings could be drawn. These strengthened the findings of the survey as the main perceived and experienced traffic-related matters of concern were found to be air and noise pollution. With respect to the entries around traffic issues experienced during the year, results have been more standard, e.g. most people confirmed very low traffic levels during Summertime. All in all, these exercises were critical in co-exploring traffic related issues at a great level of granularity. These findings represented an important input to co-designing the case study as well as for enabling participants to better interpret the data collected by the sensor, i.e. to relate them to their perceptions and experiences.

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Figure 14 - Screenshot of the participatory timeline exercise activity during an online kick-off event

Although the content of the events was perceived as 'very good' overall, the introduction to citizen science proved to be less engaging. Most participants were mainly interested in sustainable mobility and the specific link between this and citizen science. The workshop leaders also noticed a variety of knowledge on technology among the participants. While some were very tech-savvy, there were also participants who had never heard of sensor technologies. To organize these events in an inclusive way, it might be a good idea to start these workshops with a more basic explanation of technology (e.g. what is software, what is hardware) before moving on to explain the Telraam sensor.

Finally, the frustration in these workshops was apparent when it turned out that many of the participants would not be eligible to install a Telraam themselves, given the strict conditions based on location and visibility of the street. This issue was addressed using the strawberry plants, as described above.

Kick-off workshop

Three kick-off workshops took place in Spain. These were aimed at possible Telraam counters, guiding them through how to install a Telraam sensor. In total, **16 citizens** participated in these workshops. Participants were mostly female (65%; N=13). Data about age has not been measured for all workshops. Details on the demographics of those attending can be found in *Table 6*.

The following topics were discussed and explained:

1. Summary of co-design workshop
2. Technical guidance on how to install a Telraam
3. Technical explanation of the counting algorithm
4. Feedback of participants and questions

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Only one of these events were evaluated. The Spanish team reported the positive attitudes of all participants in this kick-off workshop. This is borne out by the data, as all participants gave this workshop the maximum score out of five. In addition, all participants indicated that they felt they knew everything they needed about the Telraam sensor thanks to the workshop. Again, all participants gave full marks out 5. An exceptionally good result, which, according to the workshop leaders, is largely due to the detailed technical explanations provided in the workshop. This explanation proved important to set expectations, and helped participants to appreciate their involvement and prevent surprises (e.g. knowing the sensor does not count at night, and it doesn't count heavy vehicles until it calibrates, etc.).

Table 6 - Details and demographic data of participants in the kick-off workshops. NM = not measured.

Kick-off workshops		**Madrid**	**Barcelona**	
Venue		Online (Zoom)		
Number of participants (all 'participating citizens' yet to install a Telraam)		5	5	6
Gender	Female	2	5	6
	Male	3	2	2
	35 – 49	1	NM	NM
	50 – 64	3	NM	NM
	65 +	1	NM	NM
Average evaluation score (from 1-5)	In general, how did you like the workshop/this event?	5.0	NM	NM
	Do you feel capable of installing your Telraam at home/yourself now?	NM	NM	NM
	Do you feel you know everything you need to know about Telraam?	5.0	NM	NM

In Madrid/Barcelona, guiding Telraam installation online posed a **challenge**. Working with different people with different levels of technical skills, has made it challenging to provide practical guidance for everyone at the same time. To tackle this issue, the local team split up the participants in several digital rooms during the workshop. One for those with advanced digital skills and one for those with not as much digital skills. At the end of the session, all participants came back together in a plenary session. Although this approach proved effective in providing tailor-made explanations for the Telraam sensor installation, it did cause some timing problems as not all participants were ready at the same time.

However, this experience has resulted in a series of useful takeaway lessons for the future, as significant feedback on the process has been gathered by both the local case leaders themselves and the participants (and taken on board by TML as part of WP3).

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Aware of the varying skillset of participants, the Spanish team later organized an additional so-called "help clinic". This was an online session where the local case leaders were available for assistance to those experiencing issues. A two-hour time slot was allocated where any counting citizen could connect, at any time during this window, to receive support. Only two people attended, however they could receive tailored help to guide them through the installation process. To further support the installation process, an 8- minutes long spoken video (in Spanish) with a clear visual explanation of the overall process was created and shared.

To **improve** future kick-off workshops, we suggest organising two separate workshops according to the technical level of the participants. It would be up to the participants to assess their technical knowledge and to join the appropriate workshop. This would potentially avoid the less technically savvy people feeling excluded or less skilled compared to others.

Data analysis workshops

Three data analysis workshops took place in Spain – one for each city, and one accessible to all participants. In total, **51 citizens** participated. These were mostly men (61%; N=31). Data about age, involvement in the project and workshop rating was not measured for these workshops as this data was already captured during the registration phase in the beginning of the project. To avoid asking for the same data twice, it was not repeated.

Details on the demographics of those attending can be found in Table 7.

Data analysis workshops in Spain were designed and delivered to:

1. Recap on the WeCount project and what progress had been made to date.
2. Present and discus the descriptive analysis conducted.
3. Present the results: integrating air pollution and traffic data.
4. Train citizens in reading, understanding and interpreting the data, allowing them to debate numbers with a common understanding and brainstorm next steps.
5. Conclude and present next steps.

Table 7 - Details and demographic data of participants in the data analysis workshops. NM = not measured.

Data analysis workshops		**Madrid**	**Barcelona**	**All participants**	
Venue		Online (Zoom)			
Number of participants		23	7	12	9
Gender	Female	12	2	3	3

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	Male	11	5	9	6
Age	All ages	NM	NM	NM	NM
Project involvement	All types	NM	NM	NM	NM
Average evaluation scores	Data analysis questions	NM	NM	NM	NM

Deviations from the evaluation plan:

Focus group

The Spanish case study decided not to pursue focus groups, and instead opted for a participatory exercise and post-event survey to capture data required for this element of WeCount (**Error! Reference source not found.**).

Local Champions

The Spanish case study leaders set out to engage community champions (i.e. people who work directly with communities and seek to support and empower members to improve their lives), position WeCount within their existing interests and domains, and involve them in the case study. During this process, communication materials were transferred to 26 different organisations so they could expand their boundary of community involvement (and beyond through their own networks) and in turn involve more participants in an informed way. The involvement of these community champions was critical: they beta tested and co-designed the WeCount process, and through their leadership encouraged citizens to act on the WeCount data.

The Spanish team chose not to further entitle these community champions as 'local champion' and did not pursue labelling local citizens as in general community champions could identify only one or two people that met these requirements. Furthermore, the team did not want to add any additional responsibilities or stress to individuals – with time they may have introduced the concept but they felt it premature to do so before the citizen could familiarise themselves with the basics and gain trust in both the team and the effectiveness of the technology.

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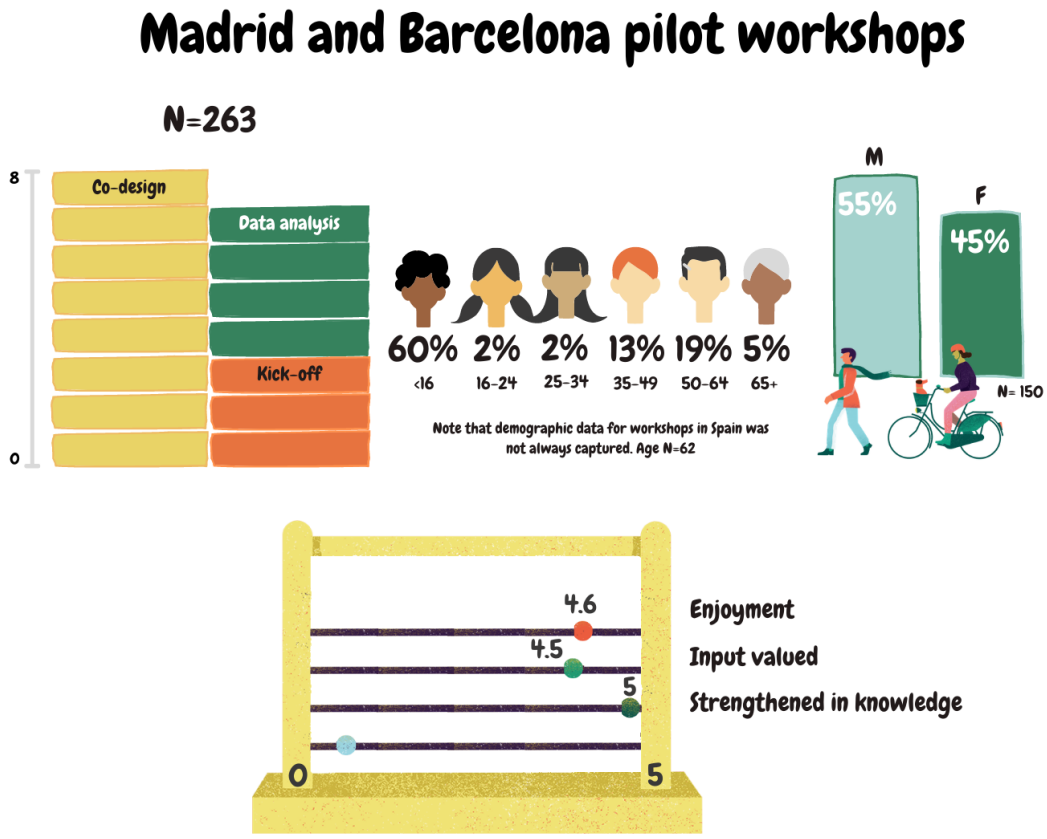
Summary of Events and workshops in Madrid/Barcelona



5.4 Citizen's experiences of WeCount

In this section we present formative and summative evidence from the citizens engaged in the project.

5.4.1 Leuven

At the time of writing **D4.1 Summative Pilot Report – Leuven & Madrid (Part B: Leuven)**, the case study in Leuven had 461 members on the Telraam platform, and 272 counting citizens, with around 185 still counting traffic (including the devices from the pre-WeCount pilot in Kessel-lo). A total of 350 participants were subsequently invited to complete the survey in Leuven. Of all those invited, 88 (25%) completed the survey by the time of closing. This section of the report presents the findings from the survey, supplementing the evidence with excerpts from D4.1 Part B and the citizen interviews.

A total of six interviews were conducted by case study leaders in Leuven. They selected the participants they thought best represented a diversity of views, demographics and participant types.

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5.4.1.1 Participant types

The survey respondents represented each of WeCount citizen categories (see section 3.3 WeCount participants). 79% (N=74) were counting participants, 16% (N=15) were involved (but without a Telraam), 2% (N=2) represented professional stakeholders and 2% (N=2) represented 'techie' people, and finally 1% (N=1) was a local champion (Figure 15). For a more detailed explanation of the types of roles played by participants, see Table 8.

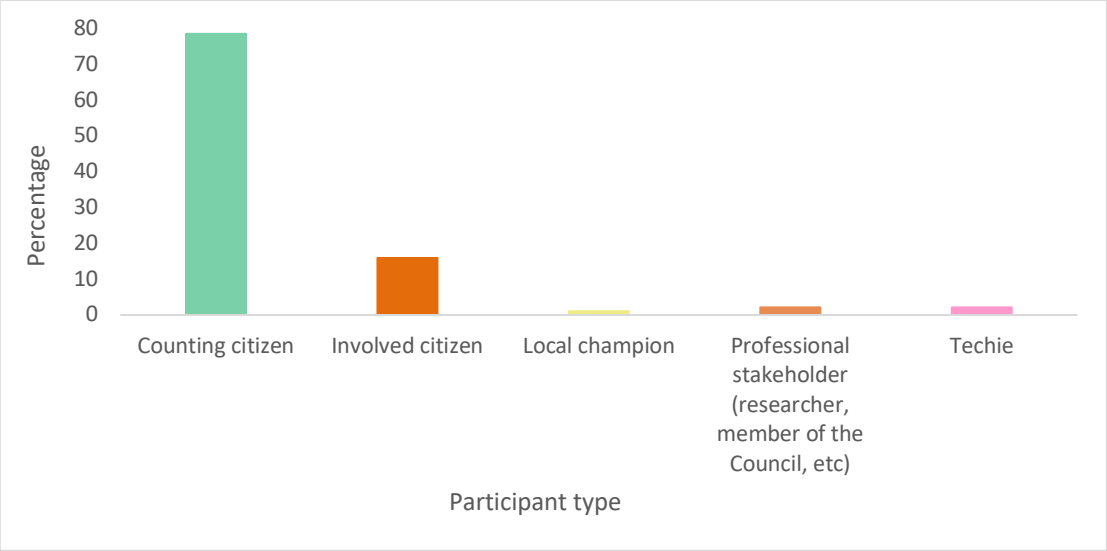

Figure 15 - Participant types in WeCount Leuven (N=94)

Table 8: Participant types in Leuven based on survey responses

Participant type	Response rate	Role	Notes/impact
Counting citizen	N=74 (79%)	Counting traffic with a Telraam sensor. 94% of counting citizens said their Telraam is still counting. As the project is still live this is to be expected. From the 6% (N=4) that are no longer counting, the reasons stated were either unsolved technical issues (N=2), the device kept falling off the window, or unexplained other.	95% (N=56 people) of counting respondents believe the Telraam sensor to be accurately capturing traffic data.
Involved citizen – did not have a Telraam	N=15 (16%)	They were not counting because either: they were not selected (either window not suitable or someone else already counting close by); were counting manually	The manual counter is part of their neighbourhood group working to improve the street but their window was not suitable.

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		instead; attended workshops or events only; volunteered their time; or were not involved in any way past registering their interest, as they never received further information.	
Tech stakeholder	N=2 (2%)	both respondents stated 'offering technical support' was their main way of being involved.	A low proportion of respondents was to be expected here. As the project was targeted at lay citizens, techies were intended to provide an auxiliary role.
Research/gov stakeholder	N=2 (2%)	Representing research and city administration, respectively. The researcher attended consortium meetings, while the council representative used the opportunity to link with one of Leuven's target neighbourhoods.	The researcher reported that involvement 'enhanced community connections', 'enhanced professional connections', 'provided evidence to support work', and 'improved my understanding of traffic-related issues'. For the council representative, they are yet to do anything with the data.
Local Champion	N=1 (1%)	The Local Champion stated they put they name forward to become one and saw their main responsibility as spreading awareness of the WeCount project.	The Champion plans to continue to spread awareness of WeCount when the project is over.

Involved citizens, people who participated in the project but did not have a Telraam, were labelled as such largely because they did not qualify for a Telraam (Figure 16).

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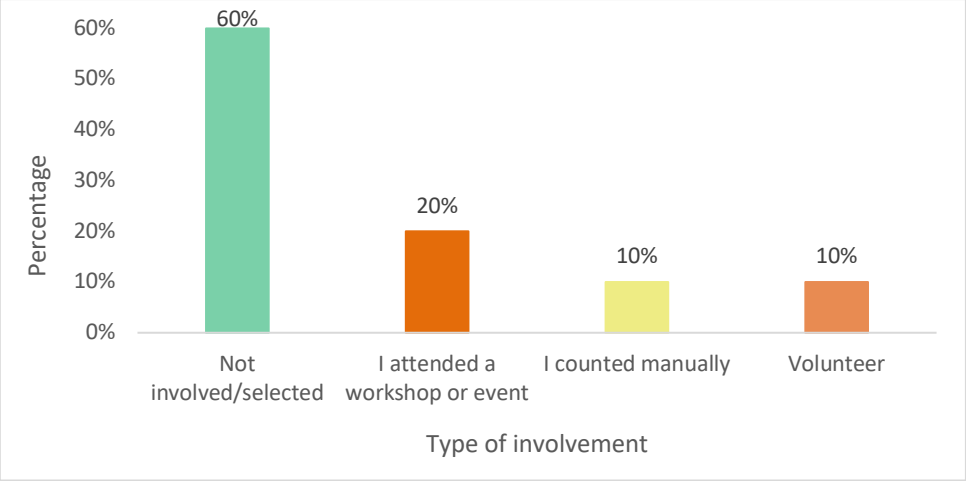

Figure 16 - Type of participation as an Involved Citizen

5.4.1.2 Survey respondents' demographics

The age of survey respondents was spread across most age categories. However, no one who filled out the survey represented the 16-24 young person's category, and the majority fell into the 35-49 (41%, N=35) age category and above (Figure 17). This is typical of citizen science projects and in line with the results from all participants who registered interest in participating in WeCount.

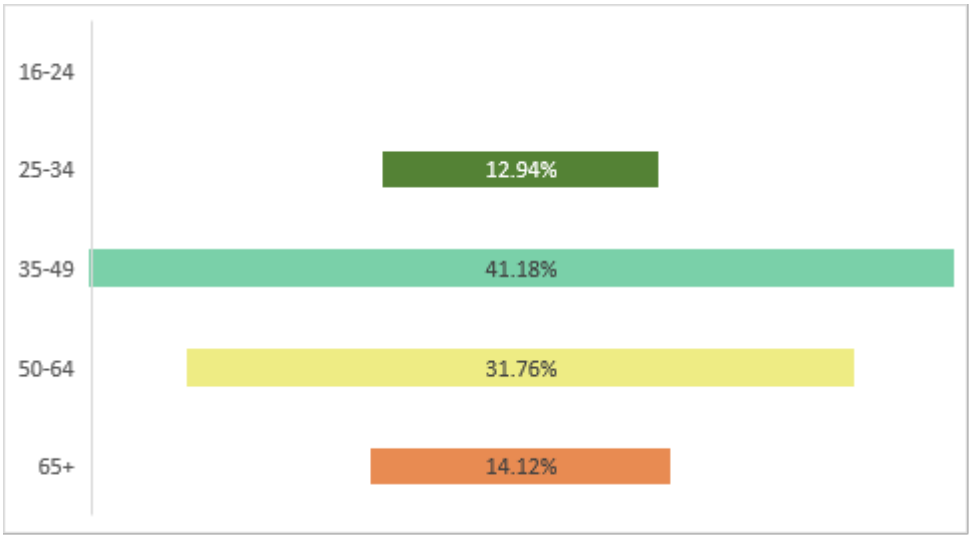

Figure 17 - Age of survey respondents in Leuven (N=85)

The gender balance of survey respondents is slightly skewed towards males (Figure 18). In line with the demographic data which shows 60% participation from males, this male bias is typical of citizen science projects. The technological dimension may have had some bearing on this ratio (61:37:1), as too might have the high level of education attainment among participants (see below). This is because men typically aspire to pursue STEM subjects (Charles 2011), and STEM occupation and further education is considerably more segregated among affluent societies (Charles and Bradley 2009). Once more, this gender imbalance mirrors the demographic data (see section 5.1.1).

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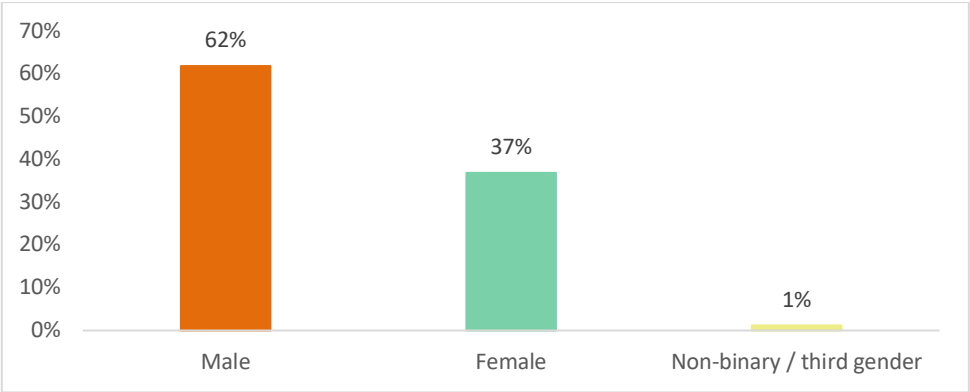

Figure 18 - Gender of survey respondents in Leuven (N=84)

Also typical of citizen science projects and mirroring the demographic data, educational attainment of survey respondents in Leuven is skewed towards degree level and above (Figure 19).

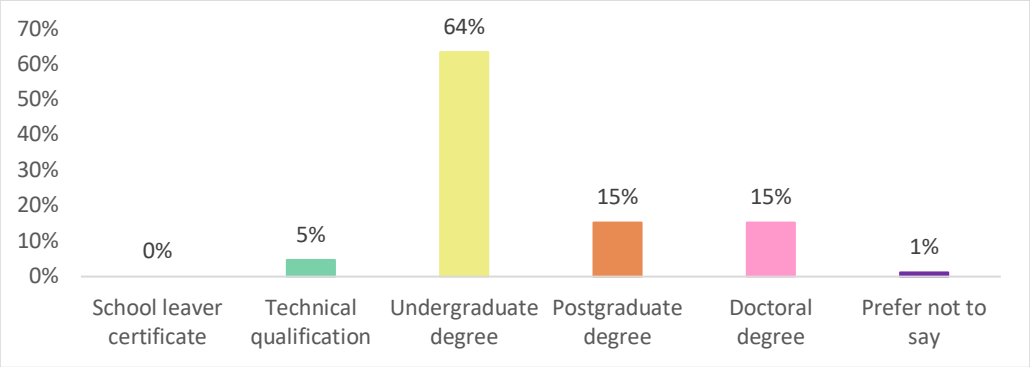

Figure 19 - Highest qualification level of Leuven survey respondents (N=85)

5.4.1.3 WeCount experience

Motivations

As mentioned above, all of those who registered to be a member of the Leuven network (and prior to receiving a Telraam if eligible)were asked about their motivations for joining (5.2.1.1) . The number one motivation for joining was to 'measure/count traffic'. Case study leaders informally gathered feedback during the project, which revealed that citizen's motivations for joining were to satisfy their existing interest in mobility and public health. The wish of these participants was to amplify their voice with evidence to support their assumptions (see D4.1 **Summative Pilot Report – Leuven & Madrid (Part B: Leuven**). Several had already engaged with policy makers or neighbours on these issues and some were eager to be local champions (see Reflections for further insight).

Reflecting this feedback (Figure 20), 30% of the final survey respondents (N=29) originally joined WeCount for their interest in sustainable mobility in general (Figure 20). 25% (N=24) joined because they wanted to contribute to research; 24% (N=23) wanted to count traffic; and 10%

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(N=10) wanted to make a difference locally. The technology was not a big draw (4%, N=4), neither was the fact WeCount is a citizen science project (2%, N=2). 1% (N=1) became involved due to referral, and 1% (N=1) became involved for a professional motivation (i.e. it was relevant to their work). This deviates slightly from the overall motivation from all Leuven participants. However, when participants were asked about motivations when they registered they had an open-ended response, rather than the closed set of options in this survey. Note too that this is a small sample and memory of original motivations may have been hard to recall given this survey was launched over a year after the Leuven case study began.

Reflecting these diverse range of motivations, the citizen interviews revealed that some had chosen to take part in the project due the ability to collect and analyse data. They described how they had been involved in other data projects, or how they really wanted to analyse data from the city (e.g. LEUCitizenInterview01 and 05; MADCitizenInterview01). Meanwhile, others, who work on communities issues in a more professional capacity, saw WeCount as a way to "keep up" motivations (LEUCitizenInterview04) of people concerned about traffic issues or to channel "frustrations" among citizens who are not being heard by authorities (LEUCitizenInterview06).

Motivations were also gathered at face-to-face pick up moments, which helped the team to connect fellow citizens with one another (i.e. matchmaking).

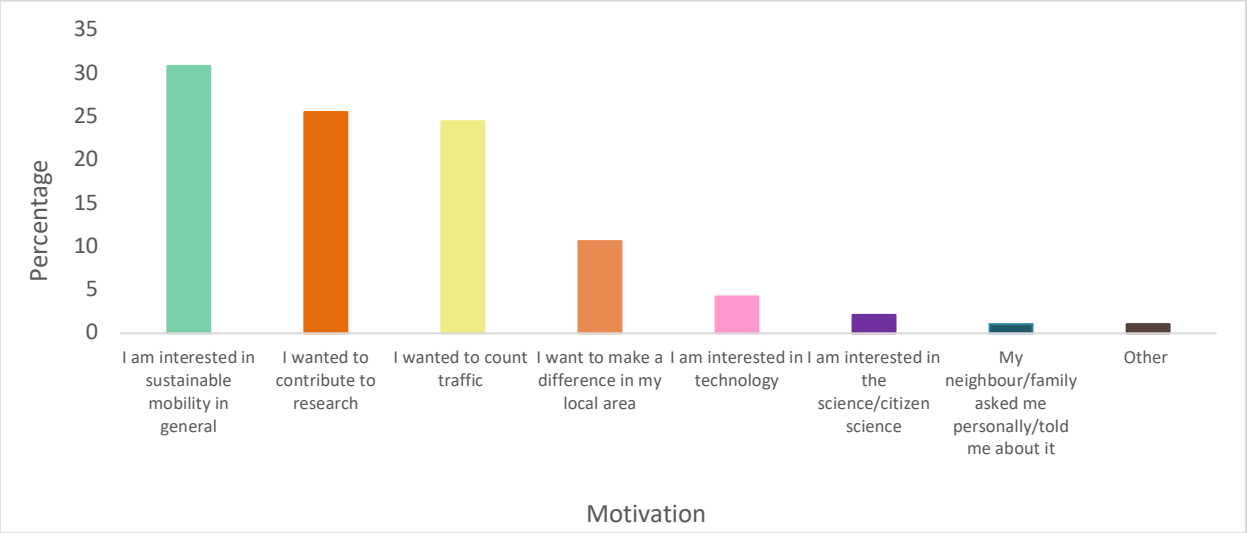

Figure 20 - Leuven survey respondents motivations for joining WeCount (N=94)

Expectations

Participants were asked to rank to what extent they thought their expectations were met during their time on WeCount. Reflecting their enjoyment rating (Figure 21), 66% (N= 61) of participants believed their expectations were met to a satisfactory level (18% extremely well and 48% very well). 27% (N=25) were moderately satisfied and 6% (N=6) believed WeCount did not live up to their expectations.

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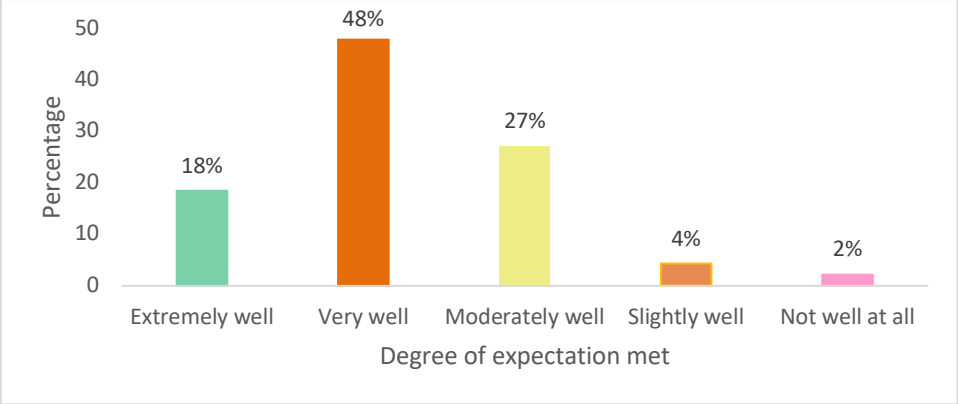

Figure 21 - The extent of expectations met for Leuven survey respondents (N=92)

Satisfactory survey responses related to the Telraam working "as it is supposed to" (LEU49, Male, Counting Citizen) and providing visibility and a clear understanding of "objective" traffic data. One respondent interested in sustainable mobility also mentioned that "The traffic in the district is now known and makes the citizens stronger in case of ill-considered actions of the city government" (LEU26, Male, Counting Citizen). Unsatisfactory responses related to Telraam never working, the uncertainty of data accuracy or whether the project will lead to reduced traffic, poor communication and being unable to participate (e.g. because another neighbour already selected) (N=1, each).

Rating time on WeCount

The majority of participants enjoyed their time on WeCount, with 77% (N=71) ranking their time as good or excellent. 20% (N=19) gave average scores, while 3% (N=3) gave negative scores (Figure 22). As is explained in further depth later (see

Technology-based improvements section), the technology itself led to some being frustrated and therefore reporting a negative experience.

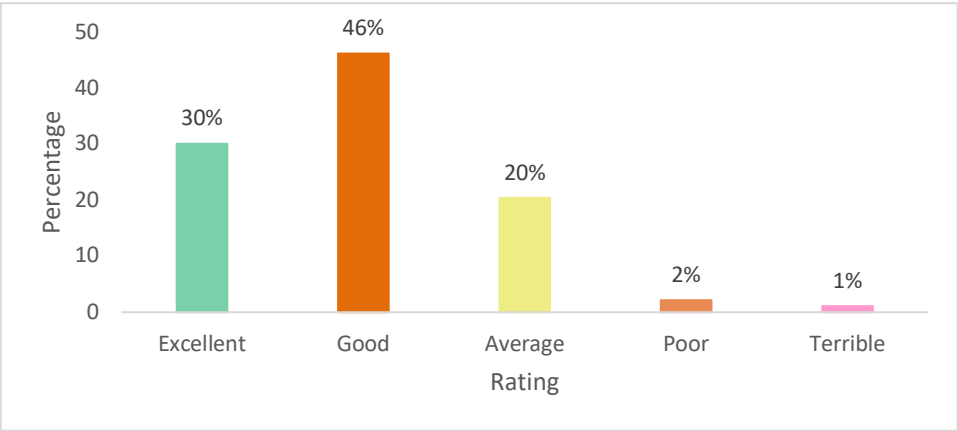

Figure 22 - Leuven survey respondents rating of time on WeCount (N=93)

From the analysis of the survey's open questions, two themes in particular shone through in regards to participants overall enjoyment: seeing the data (N=11; 27% of total positive remarks), which

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several respondents said satisfied their motivations for being involved in the first place, and the validation the data gave to people's subjective feelings (N=17; 41%):

> *It amazed everyone to know how much traffic really does pass through a particular street (in particular the amount of trucks and speeding vehicles). This data can also be used to support or evaluate mobility implementations or measurements.* (LEU14, Female, Counting Citizen)

> *Measuring is knowing, and by also measuring side streets you can look beyond your own street and work on a broader picture.* (LEU37, Female, Involved Citizen).

Favourite aspect of being involved

The aspect of being involved in WeCount that participants liked the best was stated as 'being part of a research project' (33%; N=51) (Figure 23). Although technology was not a big draw for being involved in the first place, as mentioned, it was ranked second (19%; N=29), closely followed by gathering evidence to support their campaign (16%; N=25), working collectively to solve problems (15%; N=24) and feeling as though they were making a difference (15%; N=23). Again, making a difference ranked higher here than initial motivations, suggesting that partaking in a citizen science project had a marked impact on how participants perceived themselves. Only 1% (N=2) thought meeting neighbours was the best part of being involved, with one other commenting that their favourite aspect was the bottom-up approach.

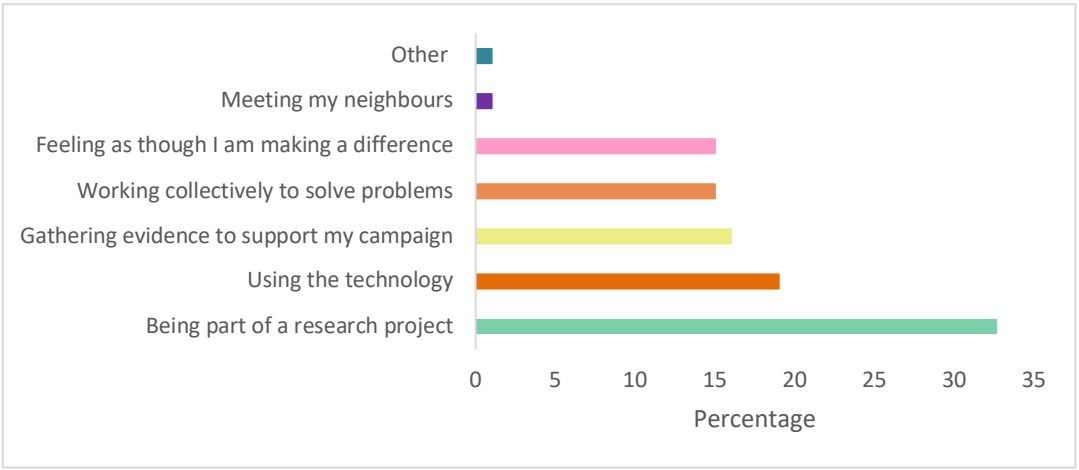

Figure 23 - Leuven survey respondents' favourite aspect of WeCount involvement (N=156)

Satisfaction of technical help and support

Reflecting participants rating of WeCount (**Error! Reference source not found.**), participants were generally satisfied with the help and support provided on Telraams' various platforms (Figure 24). Overall, Counters were satisfied with the help and support they received in the form of the online Telraam website (N=56, 80% of Total=66), FAQ (N=48, 76% of T=63) and helpdesk (N=36, 72% of T=47). More participants responded to the question on the online instructions than any other aspect for this question, suggesting that this was the most used resource. Social media (T=20) was also satisfactory, although half (50%, N=10) were neutral. This may have been because

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they did not engage with social media. Those that responded to the aspect about neighbours (N=16) were split (50:50) between satisfied and neutral. (NOTE: graph looks skewed as different Ns responded to each section)

Several respondents commented that technical support could be better (N=7):

> *I never got my Telraam 'up and running', and also nobody contacted me to do so or offer support.* (LEU76, Involved Citizen)

> *Very difficult start-up, where help is only given by email. Telephone help would help to deduce and solve the problems more efficiently and quickly.* (LEU28, Male, Counting Citizen)

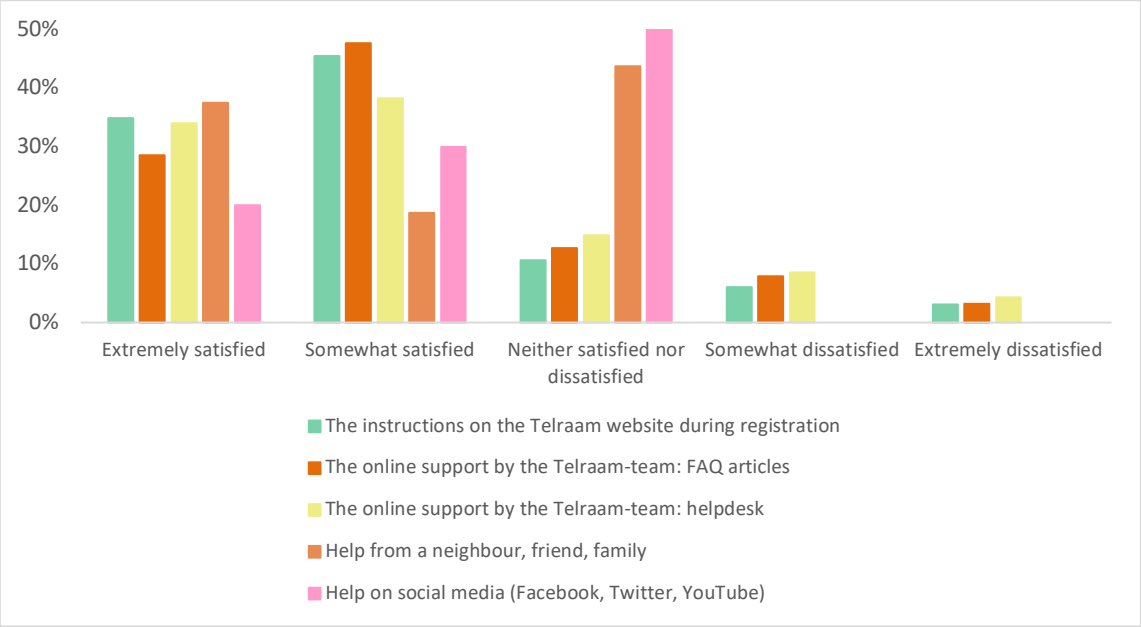

Figure 24 - Satisfaction of help and support according to Leuven survey respondents (N= variable)

Telraam data

Welcome pack

Counting Citizens received physical toolkits at their doorsteps, containing materials to help them install their Telraam and to promote WeCount. Of those that used the kit, 44% (N=27) found the toolkit to be useful (extremely or moderately); 42% (N=26) had neutral feelings about usefulness (Figure 25). 15% (N=9) stated the pack was not that useful. It is worth noting that the majority of improvements that were suggested related to the technology itself, rather than the toolkit, so it is not entirely clear whether their usefulness rankings relate to the toolkit or technology.

However, the respondents who explicitly suggested improvements to the toolkit asked for improvements to:

- the Telraam holder as the paper disintegrates and the adhesive strips wear away over time (N=5)

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- the installation process, asking for a more unified explanation, available all in one place, in "grandma language… that even non-digital-savvy people understand" (LEU04, Male, Counting Citizen) (N=4); and
- the suggestion of a bigger poster to promote Telraam (N=1).

Five respondents thought nothing needed to change.

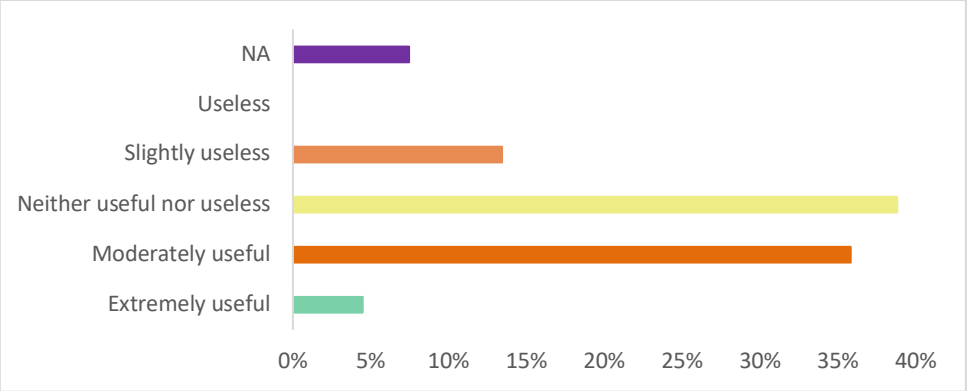

Figure 25 - Usefulness of Telraam toolkit according to Leuven survey respondents (N=67)

Use and rating of resources on online platform

The majority of citizens that responded to the survey checked the Telraam dashboard with the traffic data on a regular basis (62%, N=42) (Figure 26). All looked at the dashboard at some point during the project. 7 (10%) citizen respondents have stopped looking at the dashboard all together. Excluding those that did not use the Telraam data and related resources, the majority of respondents (52%, AVE=N35) reported good or very good ratings. Meanwhile, over 70% of counters (N=49) did not engage with the Telraam API, 40% (N=27) did not use their own data in the dashboard, and 47% (N=32) did not use the background information on the FAQ (for more information on these low engagement rates, see Improvements section). The platform emerged from initial discussions with citizens already working with the data, which they later helped co-design (Figure 26), so it is promising to see that overall this new interface proved useful.

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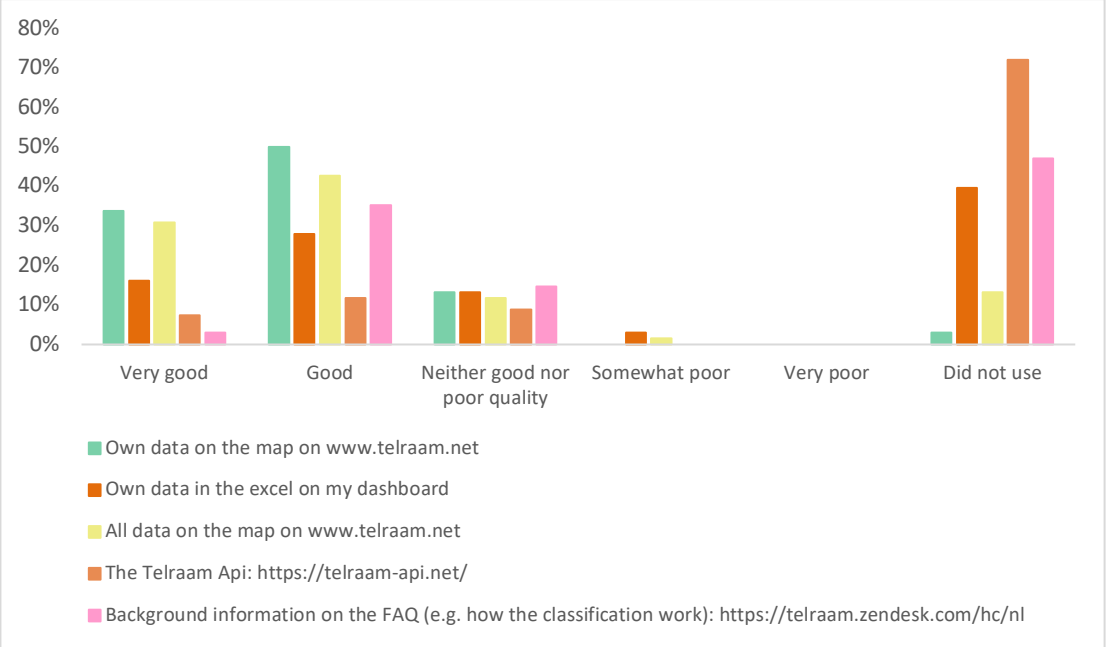

Figure 26 - Leuven Counting Citizens (from survey) rating Telraam data and resources (N=68)

Reactions to traffic data and data accuracy

The majority of survey respondents stated that the Telraam data for their street/area did not surprise them (Figure 27). Discounting respondents that did not look at the data, 10% (N=7) said it surprised them a lot, 40% (N=29) said it surprised them a little, and 51% (N=37) said it was what they expected. The participants that reported being surprised to some degree were so because either the speed (N=6) or traffic (N=23) observations were different than what they expected, with more traffic than they anticipated being the most frequent response (N=16). Meanwhile, over half of those that explained why the data was as they expected (N=19) remarked this was due to their feelings being validated (N=10).

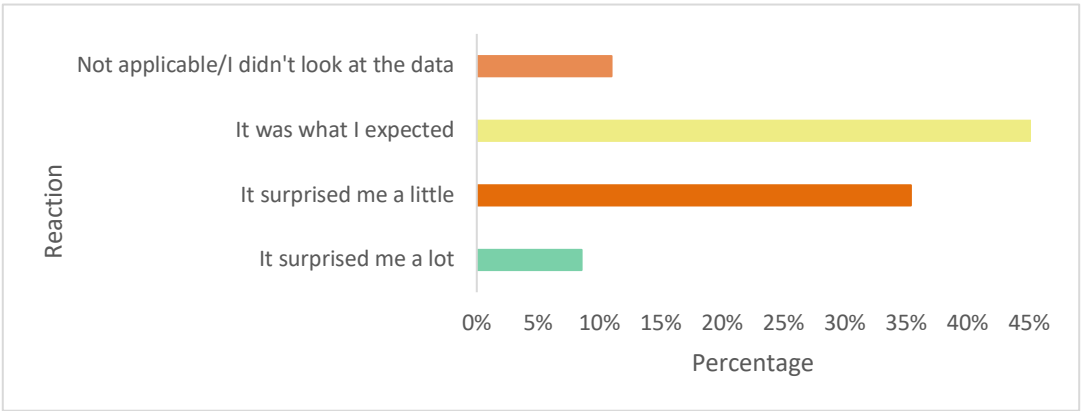

Figure 27 - Reaction to local Telraam data according to Leuven survey respondents (N=82)

95% (N=56) of counting respondents believe the Telraam sensor to be mostly accurate/accurate (Figure 28). However, when you look at why participants answered "mostly yes" (81%; N=47), the

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main reason concerns uncertainty of data accuracy (N=33; 70% of open responses) or darkness as a limiting factor (N=5; 11%).

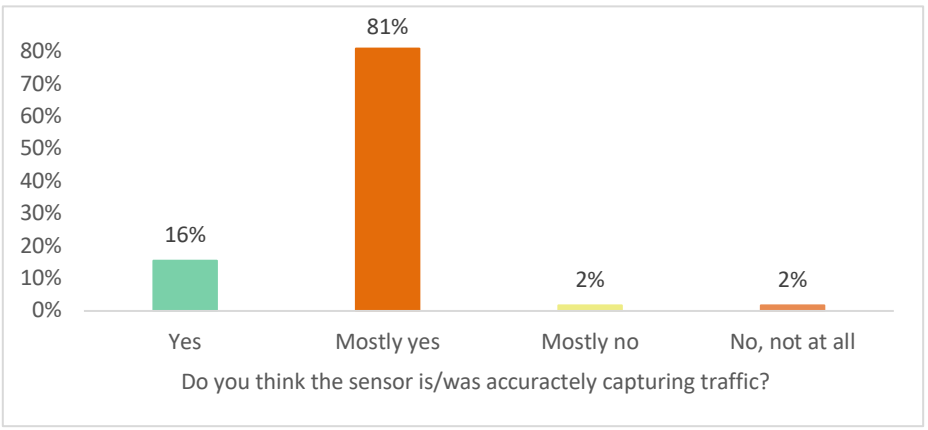

Figure 28 - Perceived accuracy of Telraam sensor, according to Leuven survey respondents (N=58)

Knowledge improvement

Participants were asked whether they thought their knowledge of traffic and mobility had improved, in addition to improvements in knowledge of local traffic-related issues, the impact of traffic on air quality and traffic safety, and how they can act on these issues. 68% (N= average 46) of participants experienced some degree of knowledge improvement (i.e. "a massive amount", "a lot" of or "some" improvement) (Figure 29). Participants reported that their local knowledge has improved the most, with 50% of respondents (N=38) for this category stating their knowledge had improved massively or a lot. Knowledge on how to act on these issues improved the least, with 25% of respondents (N=15) for this category stating they had a lot or an extreme improvement. These results reflect survey responses from the Leuven pre-WeCount pilot (Kessel-Lo), although knowledge improvement regarding "how to act" was not included in that survey (see D4.1).

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Figure 29 - Knowledge improvement of Leuven survey respondents (Ave N=68)

Change in opinion and feelings

This sense of validation is reflected in the fact that almost two thirds of Counting and Involved Citizens, and Local Champions, said their opinion on local traffic-related issues has not been changed (64%, N=53) (Figure 30).

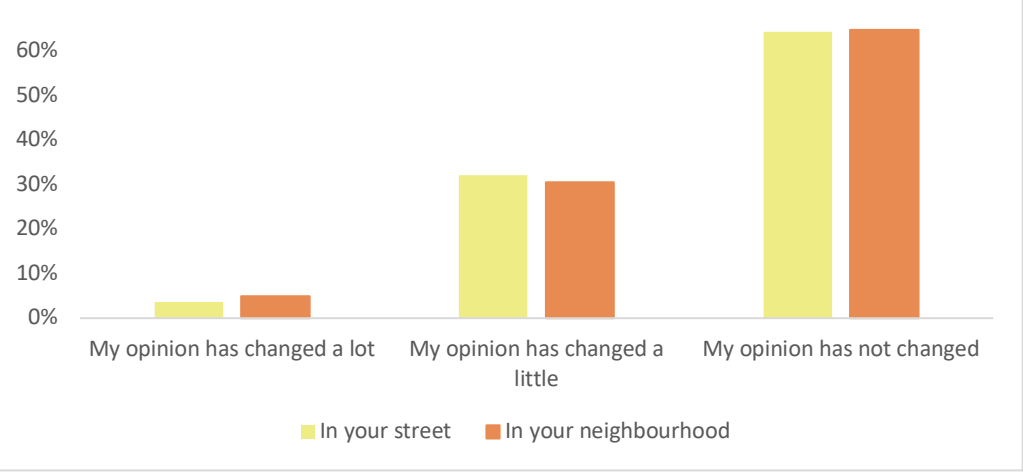

Figure 30 - Change in opinions on traffic issues, according to Leuven survey respondents (N=81/82)

Similarly, 76% (N=61) of these types of respondents do not feel that involvement in WeCount has changed how they feel about where they live. Few respondents explained their response so conclusions cannot be drawn on why their feelings remain the same.

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Levels of activism

Current levels

We did not measure levels of activism before the start of the project, so we are unable to compare whether involvement in WeCount led to greater activism. We also did not ask about the current level of activism at a city level, as we are interested in place-based activism. The final survey did ask participants about current levels of activism, however, with the majority of respondents stating they were largely inactive (58%; N=53) on traffic related-issued in their local area (Figure 31).

Activism was described as including: talking about issues to friends or Councillors, campaigning, distributing flyers, hosting events, or other activities.

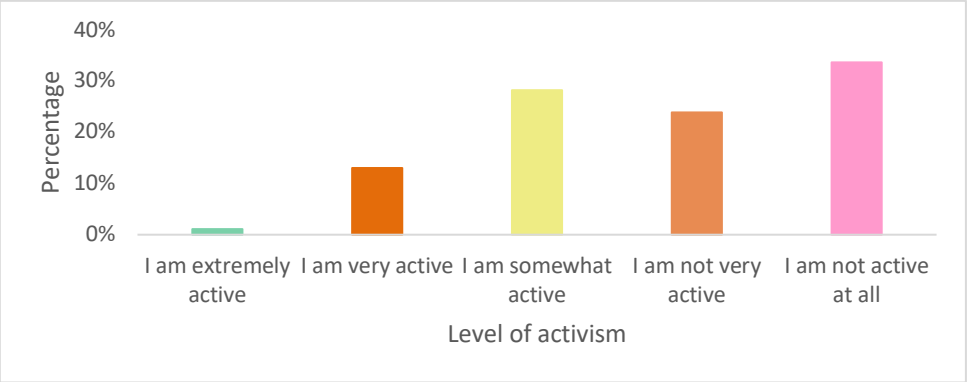

Figure 31 - Current levels of traffic activism among Leuven survey respondents (N=92)

WeCount-related action

Participants were asked whether they acted upon the Telraam data (if they saw it). Of the 83 that answered, 69% (N=57) said no they did not, 18% (N=15) said no, not yet, and 13% (N=11) said yes, they did (Figure 32). From the analysis of the open questions it was revealed that the main reasons for citizens being inactive were 1) because they did not know who is responsible for acting (N=13; 50%) (e.g. some believed the WeCount project should do more, others politicians), 2) because traffic issues do not concern them (i.e. they are not responsible) (N=8; 26%), and 3) It is unclear or they do not know how to act (N=5; 16%):

> *How, action? To whom? The city's mobility expert? Government?* (LEU14, Female, Counting Citizen).

> *I didn't know that the intention was to take any kind of action, I also wouldn't quite know what that action would entail?* (LEU65, Female, Involved Citizen)

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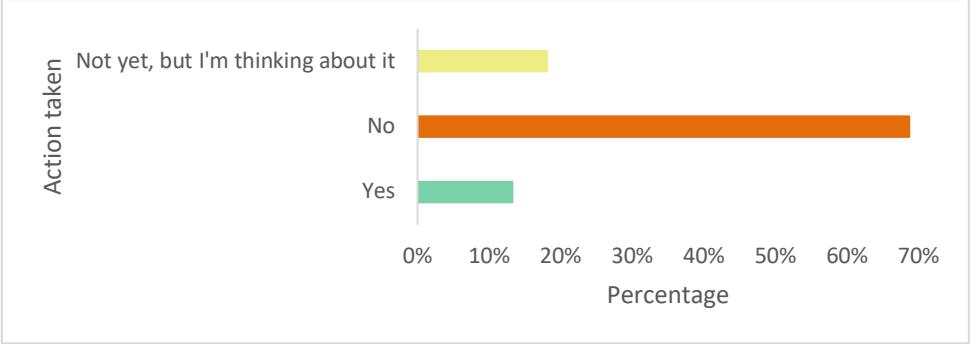

Figure 32 - Actions taken by Leuven survey respondents in response to Telraam data (N=83)

The action participants took as a result of WeCount were: notifying the relevant authorities (e.g. police, local government, etc) of the data (N=10); disseminating results locally (N=3); and using the evidence to apply for funding (N=2):

> *I am in contact with the mobility department through our district manager of the city. Our neighbourhood is being redone soon and the data from Telraam helps to make it clear that there are problems.* (LEU22, Male, Counting Citizen)

> *[I have] exchanged information and data with neighbours.* (LEU69, Male, Counting Citizen)

Some more examples of the types of action taken, varying in 'sophistication' depending on individual technical skills, can be found in D4.1 (part B) and in the image below (Figure 33). Data analysis workshops are also planned for later in the year to support citizens, regardless of their technical skills, in working with and acting upon the data, like has been exemplified in the Spanish case study (see Current levels of activism in Spain's section).

Figure 33 - Example of citizen sharing data about their street in Leuven

Many interviewees described regularly checking the website to visualise patterns across the city, or to monitor travel at certain times of the day. Sharing Telraam data locally has raised awareness among citizens in Leuven:

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My husband has become a big fan as well too. He creates a graph with an overview per hour for each month. We always hang it up. Every month we add to it. There's conversations about that. That's interesting because then you hear about things. Like the idea about the residential area, you think about it yourself, but you don't know if there are other people thinking about it too, but because people pass by and start talking about these numbers, you notice that maybe the neighbour also wants it. There's support for that. This wouldn't be happening if we didn't make these numbers visible. (LEUCitizenInterview01)

For interviewees, WeCount data has also added objective knowledge to locals traffic concerns, which has been a powerful tool when communicating with authorities; communications that had previously been dismissed as emotional or exaggerated. Likely, these actions have been fuelled by the sense of validation gained from seeing the data.

For one community worker, they found that the use of objective data has led to a diffusion of conflict when initiating community conversations on mobility – previously these conversations led to collective "nagging". Being informed and knowledgeable about the issue, participants can have more reasoned debates. The sensor, on clear display at their community centre, has become a conversation starter in itself.

Future activism

A total of 84 citizens responded to the question: "when the project ends, will you continue to work with the WeCount data?". 45% (N=38) said they would continue to work with the data and 48% (N=40) they are not sure. 7% (N=6) said no. As WeCount activities were still underway in Leuven when the survey went live this may explain why levels of activism were low and why a high proportion of respondents are not sure about what is next for them.

COVID-19 Impact (Citizens' perspective)

72% (N= 62) of respondents felt that their time on WeCount had been impacted by the COVID-19 pandemic (Total N=91; Figure 35). 29% (N=25) would have preferred face-to-face engagements, while 19% (N=16) in fact preferred engaging online than face-to-face. 13% (N=16) believed they had less time to dedicate to the project, while 9% (N=8) had more time. One person admitted that they only participated because there was nothing else to do; and one thought they had less motivation because of the COVID-19 pandemic. Four respondents mentioned that lockdown had an impact on the data they saw (e.g. because of fewer cars on the road).

As mentioned in 5.3.1, **community building** activities were severely impacted by lockdown restrictions, with everything having to move online. However, the case study leaders were able to offer face-to-face pick up moments of the sensors as lockdown measures at the time allowed outdoor meetings. These moments enabled citizens to bond with the Leuven team, ask questions and feel more at ease about the project – like in Madrid and Barcelona (See D4.1). One interviewee fondly reflected on rare in-person events organised in Leuven, prior to Lockdown:

Somehow, you end up participating because you're in a group and it has a certain charm, it's nice, it's interesting as well to hear why other people do it and what they use it for. …the weather was awful that time and still people make an effort to go there for a voluntarily project to exchange ideas with others. It was very nice to see that the things that were discussed there, were actually picked up and developed further. This was very non-binding (LEUCitizenInterview01).

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Such remarks make you wonder what the project might have been like were there not a pandemic to contend with.

> *I still feel involved, but it might have been different if we could have had more physical interaction.* (LEUCitizenInterview01).

The COVID-19 pandemic may also have had an impact on participants ability to **organise for change**, leading to less 'action' than we may have seen otherwise. Non-pandemic specific factors that may have influenced less action could be the timing of the data collection (the survey being launched prior to data analysis workshops), the small timeframe of the project (18 months) and/or the lack of a clear mechanism (at present) to feedback to decision makers.

The **role of local champions** was perhaps somewhat limited also, as they were unable to visit neighbours to help with installation, etc, like had originally been planned. As one local champion mentioned in their interview, a street party planned for the summer – an opportunity to discuss WeCount as a street – never materialized due to the restrictions. Participants received WeCount posters to start conversations with their neighbours about the project, however they could not be utilized due to restrictions.

Communication, in general, has been a challenge during the pandemic, with case study leaders having to send additional emails to participants that could have otherwise been saved for in-person discussion. Communication between citizens has also been a challenge, as one interviewee exemplifies:

> *The communication simply has been a lot more difficult. It has been more difficult everywhere. It's a lot more difficult to communicate digitally rather than simply meeting up.* (LEUCitizenInterview02)

While this interviewee has a street Facebook group to update their neighbours on the project, their post frequency declined as digital fatigue began to set in. As the pandemic rolled on, **motivations to stay connected waned**.

In terms of citizen diversity, WeCount Leuven had a clear strategy to reach **people with a low-socioeconomic status**, including chats at coffee bars and on the street. COVID restrictions meant that they instead had to go through community gatekeepers (e.g. community centres). While this was helpful to some extent, they were unable to reach many with this status. The community worker interviewed by the Leuven team agreed that meeting people in person, over 'a coffee', would have been easier for involvement, especially as some of their service users do not have computers. The Leuven team reflected that to them raising awareness of the project to marginalized groups was more important than involving them in data collection, although they have since added manual counting as an option for citizens and are exploring others ways to involve people who do not have access to a computer (see D4.1, part B).

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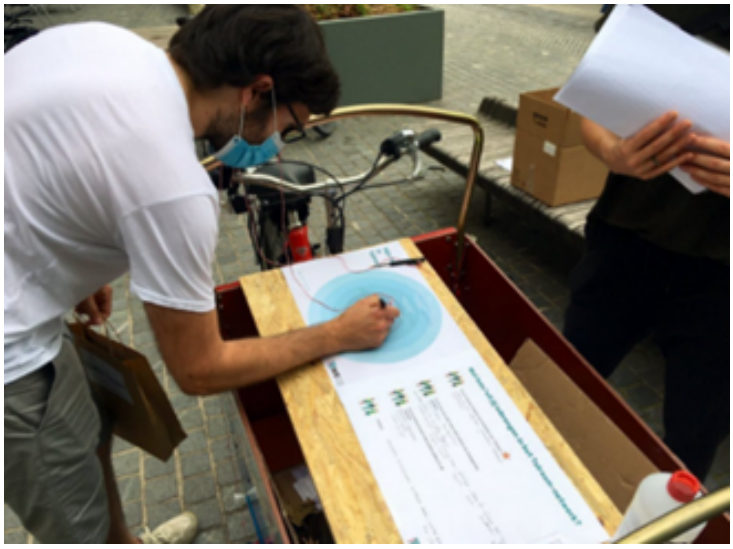

Figure 34 - Engaging citizens at in person pick-up moments

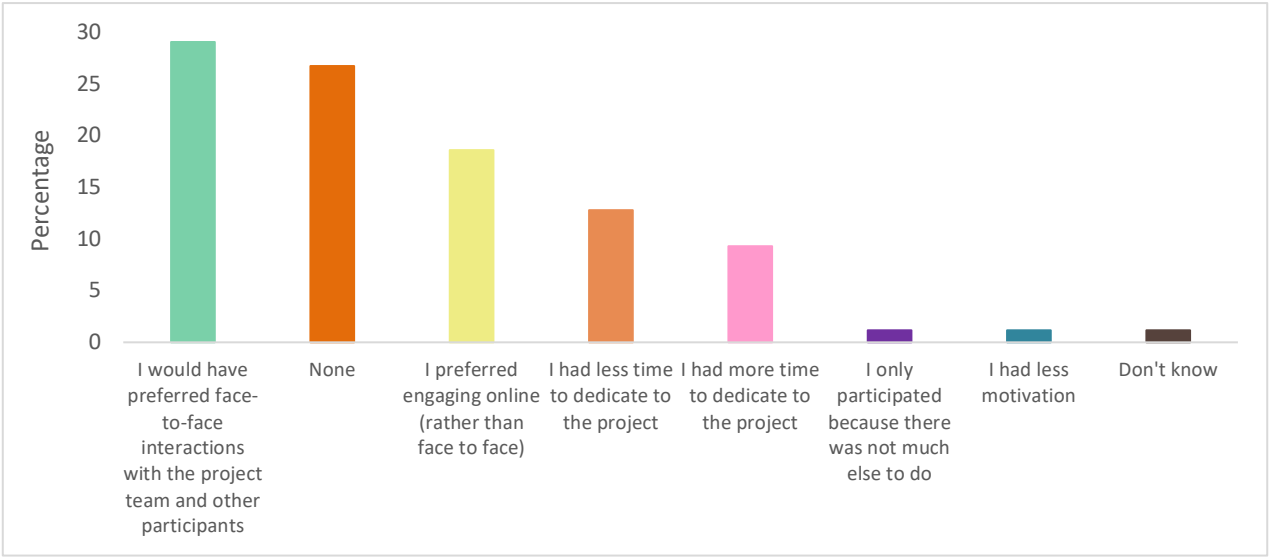

Figure 35 - Impact of COVID-19 on experience of Leuven survey respondents (N=91)

Improvements

Three areas in need of improvement according to Leuven respondents are: **a mechanism to show if efforts made a difference** (35%; N=37), **technical improvements** (22%; N=24) and **more ways to be involved** (14%; N=15) (Figure 36).

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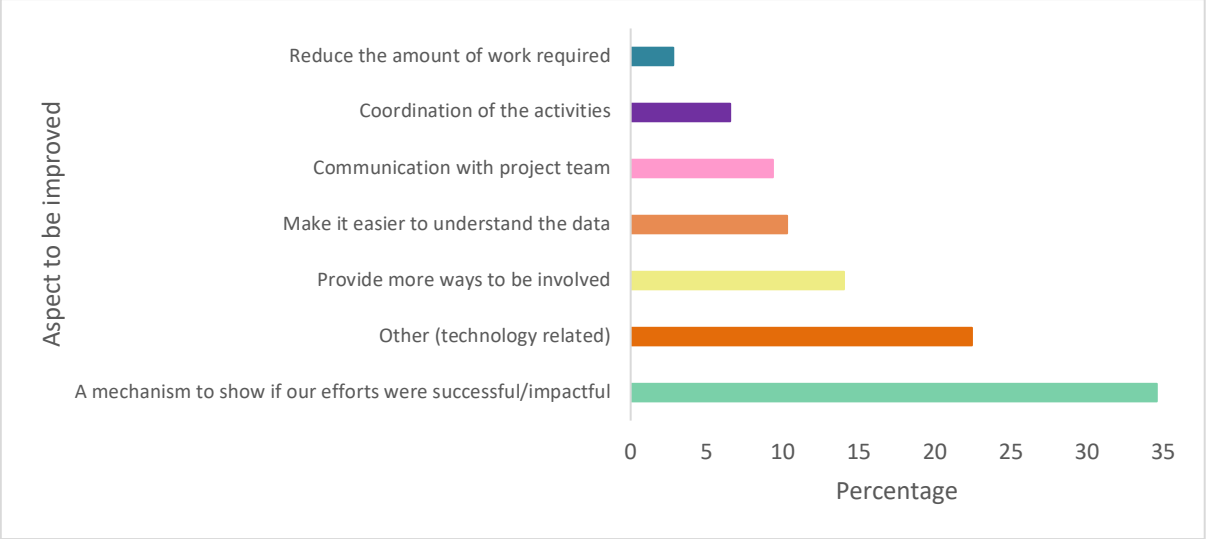

Figure 36 - Aspects of WeCount in need of improvement, according to Leuven survey respondents (N=107)

A mechanism to show if efforts made a difference

Eight respondents commented in the 'please explain' section of this question on improvements (N=7; 9%) that they **had not received any further information** since the first round of communications/since installing their Telraam. Meanwhile, 15 respondents (16%) mentioned that they would benefit from **impact reporting** to understand what is done, if anything, with the data:

> *So far it is going fine, but I still hope to see some results of how the data collected supports and influences policy decisions.* (LEU60, Female, Counting Citizen)

> *We need to make the Telraam project more visible and uniformly recognizable in the streets.* (LEU86, Male, Involved Citizen)

Other suggestions made, included adding additional data to build a clearer picture of mobility locally and project-wide. For instance, **including data on how 'liveable' a street is** depending on car volumes and the number of pavement parkers, data stories on other case study and complementary datasets (e.g. airplane traffic). All of these ideas have since been taken on board or actioned by the WeCount team.

Technology-based

Participants experienced issues with the technology that inhibited their ability to count traffic, or count traffic accurately. This is something Telraam have been aware of since the start of the project and have worked continuously to improve together with counting citizens (see D4.1, part B; D). Online Q&A sessions the FAQ page and remote helpdesk all emerged in response to initial feedback. However, as mentioned by some of the Spanish case studies respondents (see section Improvements in 5.4.2.3), this has, at times, led to feelings of overwhelm as participants do not know where to turn when needing to ask a question. Mobile teams of tech-savvy local champions had also been envisioned but this needed to be scrapped due to Lockdown restrictions (see D4.1,

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part B). Low uptake of the API in both case studies (70%; N=49 in Leuven) is also indicative that perhaps some aspects of the WeCount project were too technical, although this would require further investigation.

Of all the comments made by Leuven survey participants with regards to improving the WeCount experience (N=145), the comments most frequently mentioned related to the sensor and related data (N=130; 90%). **Inaccurate data collection** (N=65; 50% of all comments) was the most frequently mentioned technological issue, with over- and under-counting, inaccurate speed, darkness and limited view from camera all considered part of this umbrella category. The need for a ground-truthing step was mentioned by several participants as a way to check data accuracy (N=5). **Wi-Fi, including intermittent data collection**, (N=16; 12%) was the second most popular technological issue raised by survey respondents. Third was **data analysis and reporting** (N=15, 12%). Specifically, participants felt the project could benefit from periodic reporting and updates on what is being done with the date to create change locally or at policy level. Forth was not being able to count because participants **did not qualify** for a Telraam (N=13; 10%). Finally, for eight participants (N=7; 5%), **unresolved technical issues** meant they could no longer continue with the project. See summary in Figure 37.

Figure 37 - Top 5 technical issues in WeCount Leuven, according to survey respondents

> *Currently there are larger numbers at the end of the day, of which I do not know whether they reflect reality correctly, or rather an effect of the setting sun (and associated long shadows?). It is a pity (but clearly communicated) that the Telraam can only count in daylight.* (LEU62, Male, Counting Citizen)

> *I had technical problems in the initial phase (at certain times it was necessary to reboot my Telraam daily, so the data collected was not complete/reliable). This has caused my motivation to drain.* (LEU41, Male, Counting Citizen)

Citizen interviews mirror these technology issues, with reference to the installation procedure, Wi-Fi, inaccurate counting, e.g. peaks when there are not any, and the ambiguity of the dashboard. A lot of effort was required from early adopters of the technology, as one local champion comments:

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I have to admit, in the beginning, I struggled a lot. At some point, I even returned it to you, but then somebody came to my house. Then it became clear that there was a problem with my Wi-Fi name. Then I went to the internet provider and, that way, I discovered I had a very old subscription and that it would be better to change it... It took a while to figure it out, but once I succeeded, it was. (LEUCitizenInterview02)

More ways to be involved

There are possibly two main explanations for a lack of ways to be involved: project design and the COVID-19 pandemic. First, the **project relied heavily on counting citizens** with a Telraam. Originally there was only one alternative way of counting if you could not or did not want the Telraam; using another kind of sensor, e.g. for air pollution, once/if it was deployed. This meant that if the window was not suitable or technology did not interest the citizen, they may not have been able to take part in counting; or by the time the other sensor was made available may have lost motivation. While some survey respondents got involved through volunteering, attending workshops, or counting manually (either of their own volition or after the Leuven team set up a mechanism to facilitate this), several said they were never involved because they did not receive further information or were not selected. Participants were not selected either because their window was not suitable, or another person in their street had already been selected. Second**, staff struggled to find more ways to involve participants due to lockdown restrictions**, there unfamiliarity of online delivery, and changes to their own work-life patterns.

Local champions, initially seen as mediators between the project team and local communities, took more of a back-seat role, further **limiting the opportunity to spark enthusiasm** among citizens and bringing them together in common cause. Any energy that could have been captured was diverted to dealing with the impacts of the pandemic. (See Local champions in Leuven5.3.1 for more information).

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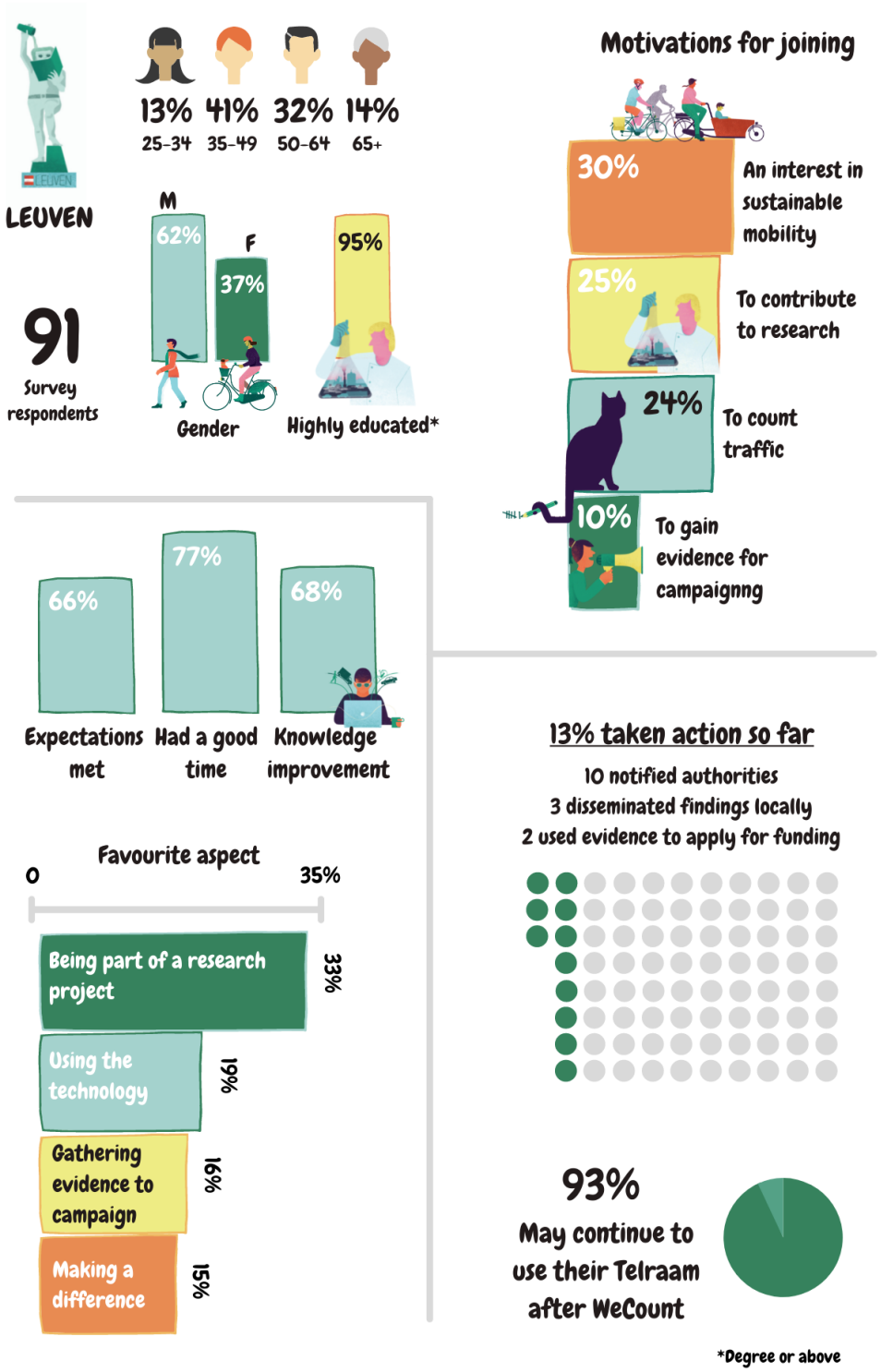
5.4.1.4 Summary of Citizen's experiences of WeCount in Leuven



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5.4.2 Madrid/Barcelona

As of March 2021, there were 750 members in Madrid and Barcelona. Initially, 589 indicated that they were interested in being involved as counters, i.e. hosting a Telraam sensor at their homes. However, after reviewing the suitability of their window's view, only 102 could be selected and were sent or given a Telraam. Thanks to a successful campaign, 1,000 additional participants became involved in measuring air quality with a biosensor (strawberry plant, see 5.2.2.1 for further explanation).

A total of 750 participants from the Madrid and Barcelona case study were invited to complete the final survey. Of those, nine (4%) completed the survey. One of the reasons for the low response rate might have been email fatigue, as during the time of the survey launch the case study leaders were asking the participants for feedback several times, and participants were already contributing their time and energy through online data analysis workshops. Unfortunately, this small sample means that the evaluation team are unable to draw any solid conclusions from the responses. However, as we have collected supplementary data from workshops and citizen interviews, and drawn from evidence in D4.1 (Part A) we have built a more complete picture of the overall situation in the Spanish case study.

A total of seven interviews were conducted by case study leaders in Spain. The leaders selected the participants they thought best represented a diversity of views, demographics and participant types.

Figure 38 - A member of WeCount Spain demonstrating how to use the Telraam to a counting citizen

5.4.2.1 Survey respondent types

Of those that completed the survey (N=9), 6 were Counting Citizens (67%), and the remaining three were divided between Involved Citizens (but without a Telraam), Professional Stakeholders and Local Champion (N=1/11% each) (Figure 39). For a more detailed explanation of the types of roles played by participants, see Table 9.

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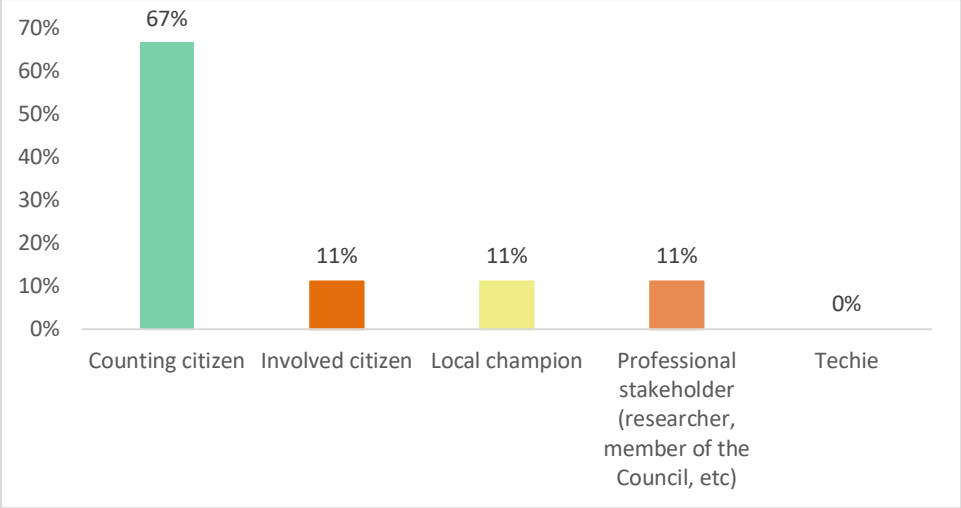

Figure 39 - Survey respondents participant type in WeCount Madrid/Barcelona (N=9)

Table 9: Participant types in Madrid/Barcelona based on survey responses

Participant type	Response rate	Role	Notes/impact
Counting citizen (could be with a Telraam, strawberry plant or manual counting)	N=6 (67%). Total = 100	Counting traffic with a Telraam sensor.	60% (N=4) of counting respondents believe the Telraam sensor to be mostly accurate in terms of capturing traffic data.
Involved citizen – did not have a Telraam but were involved in some way	N=1 (11%)	This Involved Citizen attended a workshop but never had a Telraam because they did not receive a reply to their application.	As mentioned above, many participants were not selected to have a Telraam as their window was not suitable. Thus, if they wished to continue they largely fell into this category.
Tech stakeholder	N=0		While none contributed to the survey, three technical experts were involved in helping explore the potential of re-designing the sensors to make them more suitable to the Spanish context (e.g. on balconies) and in data analysis and creative visualisation (e.g. see Influencer G, p64, D4.1 Part A)

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Research/gov stakeholder	N=1 (11%)	Representing research, this stakeholder "connected the project team with local contacts".	The researcher reported that involvement "enhanced community connections" and "enhanced professional connections". They have since "shared the project findings with colleagues".
Local Champion	N=1 (11%)	The local champion was involved as they already do this in their profession. Their role was to spread awareness.	The Champion plans to continue to spread awareness of WeCount when the project is over.

5.4.2.2 Demographics

The survey respondents in Madrid and Barcelona are predominantly from the 25-34-year-old age category (44%; N=4) (Figure 40), are female (67%; N=5) and hold an undergraduate degree or above (100%; N=9) (Figure 41). Although education attainment is typical of citizen science projects, the younger age profile and female dominance is not. While this is a small sample size, this largely reflects the demographic data captured (5.2.2.1) and case study leaders believe that this largely reflects the overall picture in Madrid and Barcelona.

> *Of all members that indicated their gender, 58.2% [N=151] were female and 41.8% [N=109] were males. These were distributed across age groups, with the majority between the ages of 35 and 49.* (D4.1, Part A, p33)

Huge effort was made by the project team to reach diverse audiences. They engaged public libraries, events and civic centres, private shops and co-working spaces – some of them in person, when restrictions allowed, in addition to collaborating with community organisations and schools, gatekeepers to more marginalised groups, and appearing on TV, radio and social media. The strawberry plant campaign presented an additional opportunity for case study leads to reach a wider audience, as the message was clear and the object familiar. Prior to these efforts, attendance to WeCount kick-off workshops were low.

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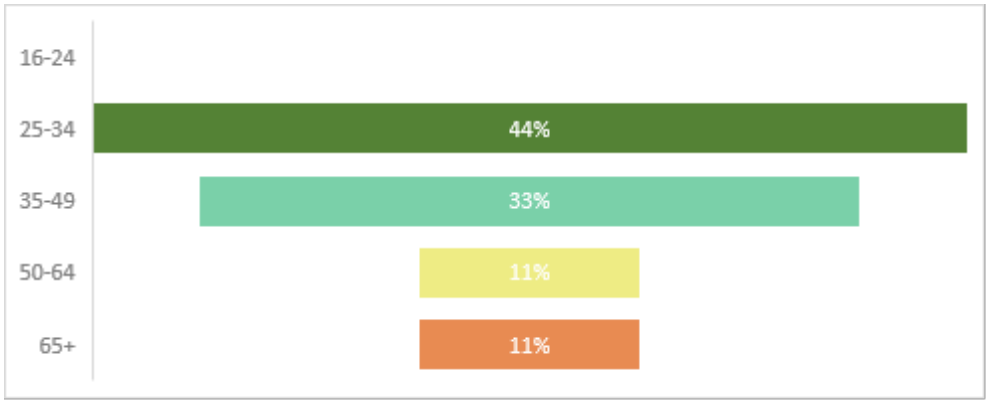

Figure 40 - Age of survey respondents in Madrid and Barcelona (N=9)

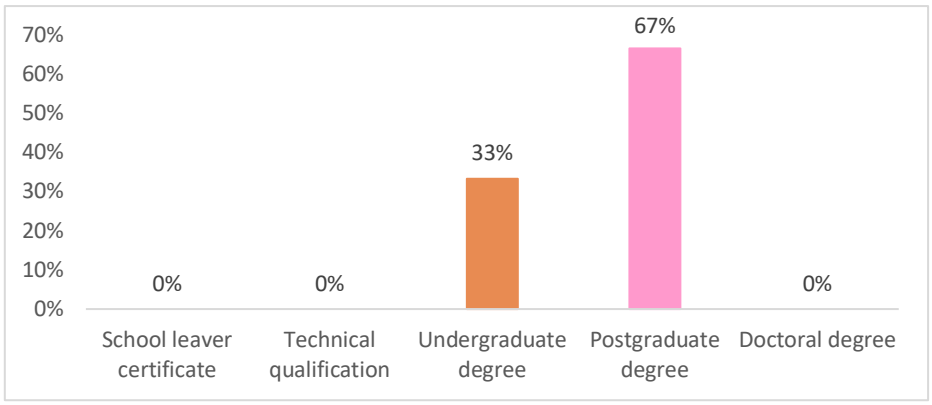

Figure 41 - Education attainment of survey respondents in Madrid/Barcelona (N=9)

5.4.2.3 WeCount experience

Motivations

The project team state in D4.1, Part A that: "According to the feedback received by participants, receiving the traffic sensor was the main motivation for joining WeCount as members" (p33). It is unclear why the sensor was a motivational factor, however – e.g. to count traffic, to contribute to research, because they like technology. They also found that the motivation to actively participate decreased substantially if participants were not able to obtain a sensor.

The survey digs a little deeper into why participants wanted a sensor. 44% (N=4) of respondents originally joined WeCount for their **interest in sustainable mobility** in general; 22% (N=2) joined because they were interested in science/citizen science; and 11% (N=1), respectively, wanted to count traffic, contribute to research or make a difference locally (Figure 42). Technology was not a big draw initially, neither was referral. The motivations for joining, and their ranking, largely mirror Leuven survey respondents. However, these motivations deviate from the full picture in 5.2.2.1, which shows addressing air pollution as being the main reason for joining. The table in section 5.2.2.1 offers a more accurate picture of motivations given the small sample size of this survey.

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Broadening this picture, the citizen interviews[2] (N=7) reveal that they first became involved due to either referral, an interest in research or science, a desire to count traffic (to find out the 'real' situation), sustainable mobility and/or a desire to make a difference.

Across both cities, most of the citizens interviewed described taking part in the project as a way to further their vision of safer communities. Cars in their neighbourhood caused congestion, pollution, noise, and unsafe walking and cycling streets, as well as impacting on their health. They planned to use the data from the Telraam to further their aims to slow cars down, or even remove them from their streets:

> *[I am involved because] this is outrageous! This is a 7-metre street that is travelled by 5,000 cars a day. I had heart surgery and I have COPD, i.e. lung problems, and noise is outrageous… I am willing to collaborate with anybody who tackles this.*
> (MADCitizenInterview02)

Ultimately, there were a variety of reasons why citizens got involved in WeCount and citizen Interviews corroborate this picture.

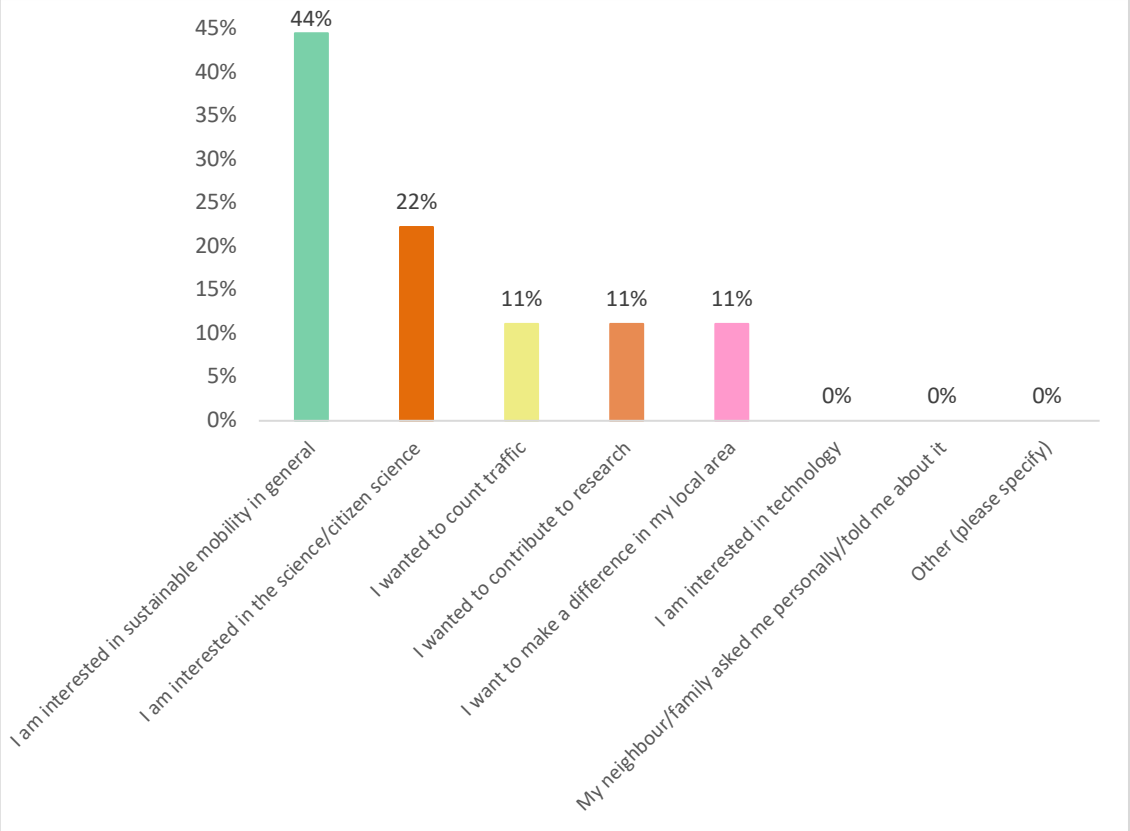

Figure 42 - Motivation for joining WeCount in Spain, according to survey respondents (N=9)

[2] Note: for ethical and practical reasons we are not able to know whether or not the citizens interviewed also filled out the final survey. However, due to the difference in motivations mentioned, we can assume that at least some of them did not complete the survey.

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Extent of expectations met

In a bid to manage expectation, the team explained the novelty of the approach in online workshops and face-to-face sensor drop offs, and explained that participant contributions would help to improve the technology itself. Requirements of hosting a sensor were also made clear to mitigate frustrations if participants windows were not suitable. The strawberry plant campaign went some way to satisfying participants need to take part, should their window not be suitable.

Over half of respondents (N=5; 56%) believed their expectations had been met to a satisfactory level (Figure 43). And citizen interviews give a sense that they too have been satisfied by the project, overall.

> *Installing the device was easy. The sensor's measurements are considered, they will be part of the investigation. The team reported the data and explained what it brings to the study. I do not mark 'extremely well' because I wish the project had no expiration.* (MAD04, Female, Counting Citizen)

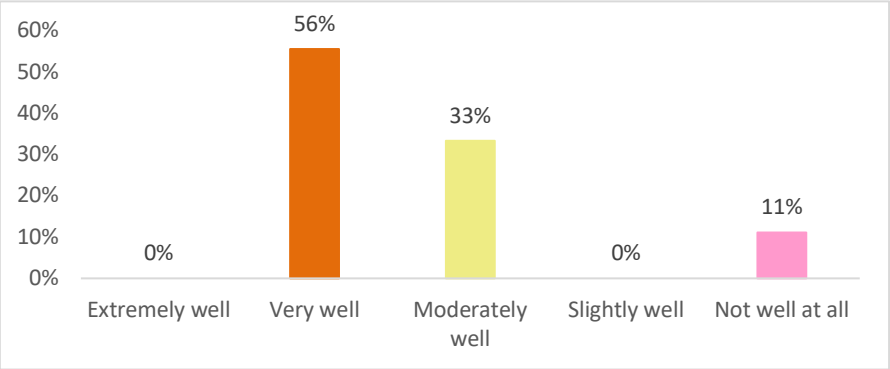

Figure 43 - Extent of expectations met according to Spanish survey respondents (N=9)

Those that felt their expectations had not been met sufficiently also rated their time as average because of complaints with either the technology or data itself:

> *I don't trust this technology.* (MAD02, Male, Counting Citizen)

> *The truth is that the data obtained seemed very scarce to me, and the way to present summarize them is not ideal.* (MAD01, Female, Involved Citizen)

As both the team and participants were figuring out the limitations of the technology as the project progressed, many additional conversations and email exchanges were had to resolve issues that had not been foreseen. This may go some way to explaining the frustration expressed in the comments above.

Rating time on WeCount

The majority of survey respondents rated their time on WeCount as good or excellent (78%; N=7) (Figure 44). Given the technological teething problems experienced by this pilot, this is a promising finding.

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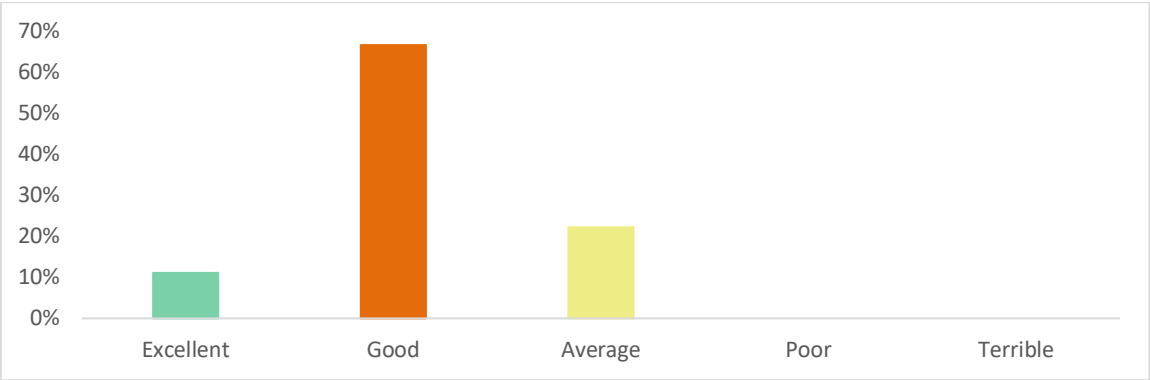

Figure 44 - Survey respondents rating of time on WeCount Spain (N=9)

From the analysis of the open questions in the survey, three themes in particular shone through in regards to participants overall enjoyment: the **validation** the data gave to people's subjective feelings (N=4 mentions), the **support of the project team** (N=3) and **seeing the data** (N=1), which satisfied their motivations for being involved in the first place:

> *[The team] have supported me and explained everything I needed to do and know with great closeness and empathy.* (MAD08, Female, Counting Citizen)

> *I wanted to be part of a research project that could measure mobility on my street. I live on a busy street and am concerned about air pollution and noise.* (MAD06, Female, Counting Citizen)

Citizen interviews largely reflect the themes from the analysis, with three (43%) agreeing about the friendliness of the team and three (43%) thankful that the project allowed them and others to see the data (which could lead to the generation of solutions). One (14%) also commented that the networked, citizen-led approach of the project was what gave them the most enjoyment.

Effort was made by the case study leaders to improve the enjoyment of participants during their on- and offline engagements as well. Games, for example were played during online workshops to keep participants active (see Kick-off in 5.3.2).

Favourite aspect of being involved

The aspect of being involved in WeCount that participants liked the best was stated as '**being part of a research project**' (37.5%; N=6) (Figure 45). Although **the technology** was not a big draw for survey respondents being involved in the first place it was ranked second (25%; N=4) in this section, reflecting the case study's beliefs in D4.1, Part A. Closely followed, was 'gathering evidence to support their campaign' (12.5%; N=2) and 'feeling as though they were making a difference' (6.25%; N=1). These findings, once again, largely mirror Leuven.

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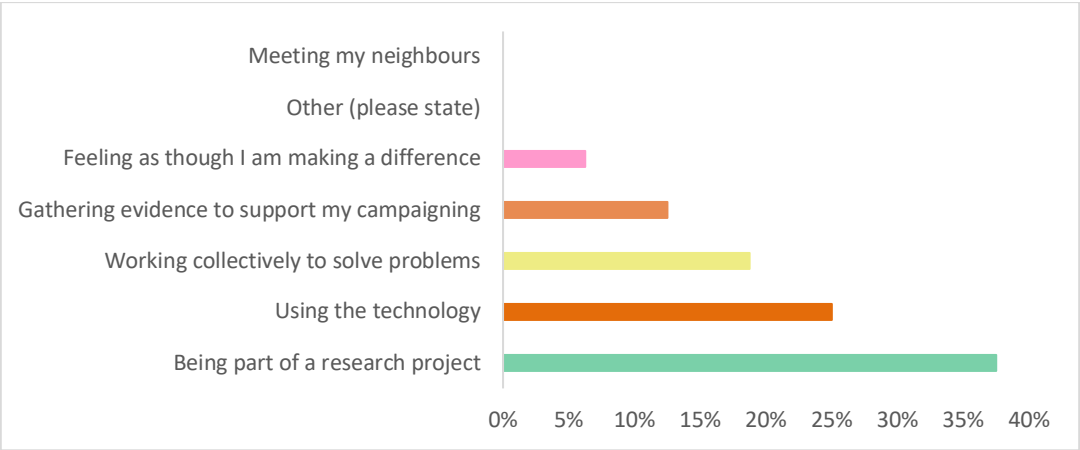

Figure 45 - Favourite aspect of WeCount Spain, according to survey respondents (N=16)

Satisfaction of technical help and support

Reflecting participants overall rating of WeCount (see above), participants were generally **satisfied** with the help and support provided on Telraam's various platforms (Ave N=2; 50%) (Figure 46).

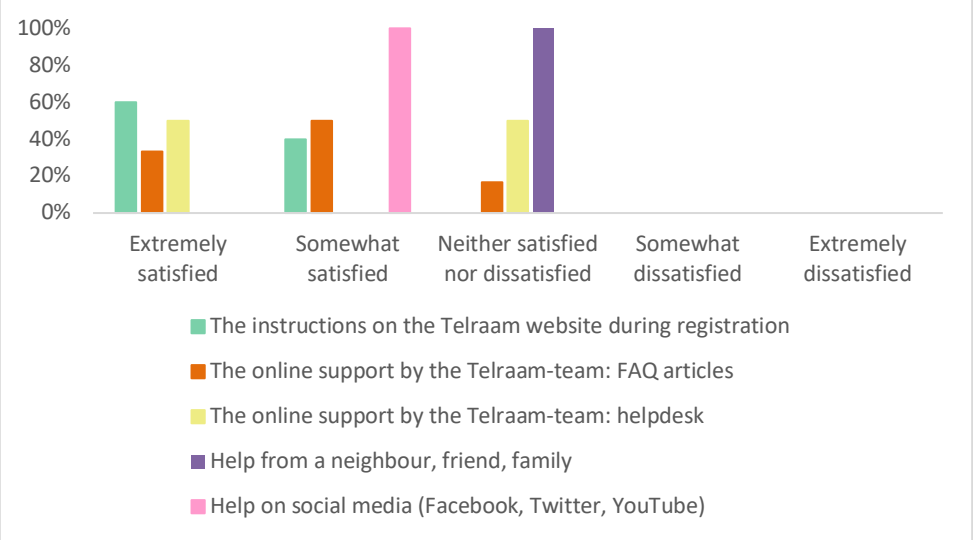

Figure 46 - Satisfaction ratings of help and support, according to Spain's survey respondents (Ave N=4)

Telraam data

Welcome pack

When counting citizens received their Telraam, it came in a bag installation instructions and promotional materials (Figure 47). All respondents that received the kit found it to be **extremely useful** (N=5; 100%).

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Figure 47 - Telraam toolkit

Use and rating of resources on online platform

Respondents rated the Telraam platform, consisting of a user interface to see counters own data (dashboard) and others data (map), along with background information and a programming interface (API). Those that used the **platform** had an **okay experience** (Ave N=2; 100%) (see overview in Figure 48 and discussion for further explanation). Two thirds of these respondents viewed the Telraam dashboard 'now and then' (N=4; 67%) and one third viewed 'now and then' (N=2; 33%).

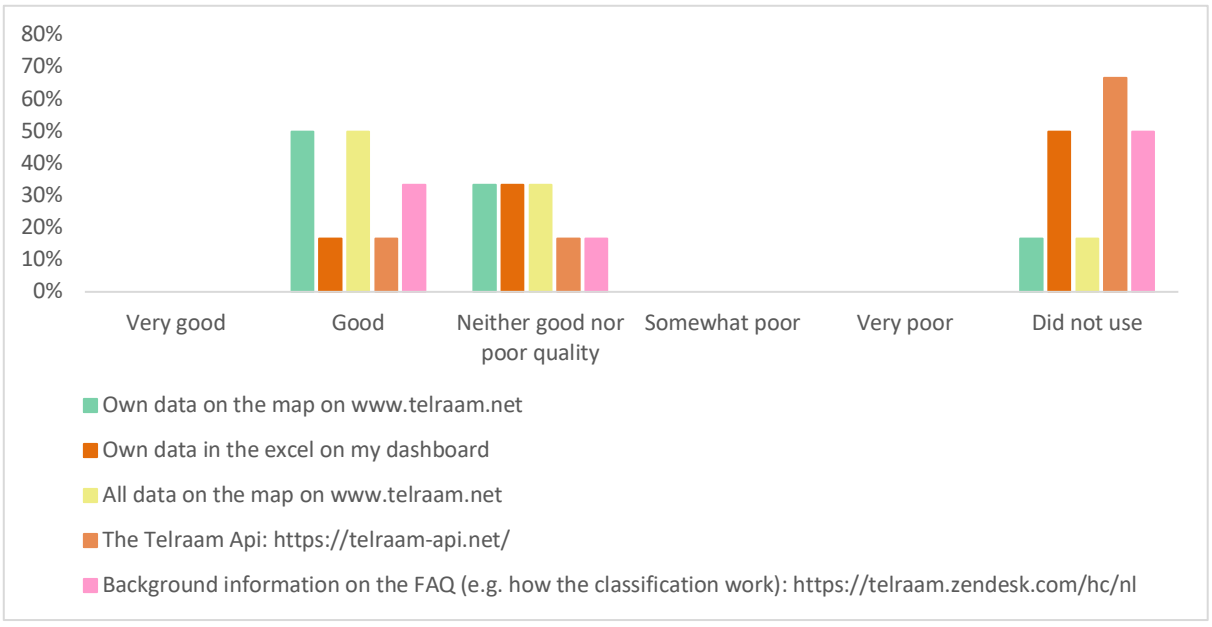

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Figure 48 - Rating of Telraam data and resources according to counting citizen survey respondents (N=6)

Reactions to traffic data and data accuracy

Unlike Leuven, survey respondents (N=8) were **surprised** by the data they saw (Figure 49). The reasons were a mix of validation (N=3; 38%) and disbelief (N=2; 25%):

> *I had a feeling that a lot of traffic was passing in front of my house, but when I discovered the data from the first weeks of Telraam, I realized that they could be a significant problem.* (MAD09, Female, Counting Citizen)

> *[I am very surprised] because it does not correspond with reality.* (MAD02, Male, Counting Citizen)

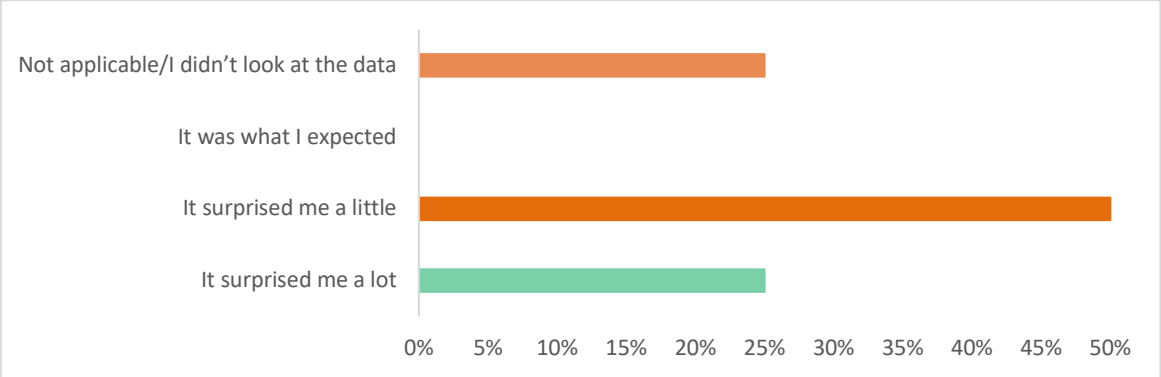

Figure 49 - Spain's' survey respondents reaction to WeCount data (N=8)

These comments reflect the response to the survey question on **data accuracy**, of which 40% (N=2) do not think Telraam data is accurate, while 60% (N=4) think it is accurate data. While this topic was not discussed directly in the citizen interviews, on two occasions reactions to the data was mentioned. Once when a citizen "shocked" city councillors by showing them their data and another who expressed their disbelief when in one day as many as 1,600 cars were counted passing their street.

Knowledge improvement

Survey participants were asked whether they thought their knowledge of traffic and mobility had improved, in addition to improvements in knowledge of local traffic-related issues, the impact of traffic on air quality and traffic safety, and how they can act on these issues. The majority of participants reported that their **knowledge** on each of these topics **increased to some degree** (Ave N=8; 89%) (Figure 50).

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Figure 50 - Knowledge improvement according to Spain's survey respondents (Ave N=9)

According to the feedback received so far by the case study leaders of the Madrid and Barcelona WeCount network, participants (including school children) have acquired knowledge with respect to three general themes:

(1) sustainable mobility;
(2) internet of things and knowledge about low-cost sensors, software and hardware, as well as data management and visualisation;
(3) citizen science and specifically how to conduct research projects involving communities of citizens (see D4.1, Part A).

Change in opinion and feelings

For the majority of survey respondents, their **opinions about traffic-related issues have not changed** at the neighbourhood level (N=5; 63%, versus N=3; 38%, reporting some degree of change) (Figure 51). At the level of the street, five (63%) people said their opinions have changed to a degree, whereas three (38%) said the experienced no change, suggesting that the project may have had more impact at the local level. This also reflects knowledge improvement at the local level, indicating that knowledge improvement may lead to a change in opinion.

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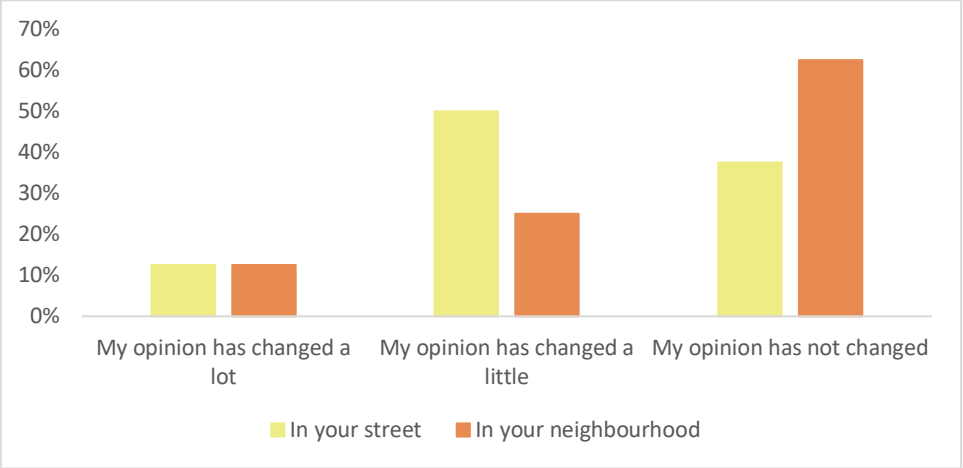

Figure 51 - Change in opinions on traffic of Spain's survey respondents (N=8)

There was an even split between respondents regarding whether their involvement changed how they feel about where they live (N=4; 50%, each).

One respondent explained that involvement in WeCount has heightened their level of anxiety:

> *I have started to worry about contamination much more than I was already worried about.*
> (MAD08, Female, Counting Citizen)

While an isolated incident, this is not uncommon in an age of 'eco-anxiety' and 'eco-guilt'. Citizen science projects need to be careful to manage these concerns, either through showing how citizens can lead the change or that their findings will be taken seriously to influence positive change.

Current levels of activism

As mentioned, we did not measure levels of activism before the start of the project or about the current level of activism at a city level. The final survey did ask participants about current levels of activism, however, with the all respondents stating they were either **somewhat active** (N=7; 78%) or largely inactive (N=2; 22%) on traffic related-issued in their local area (Figure 52).

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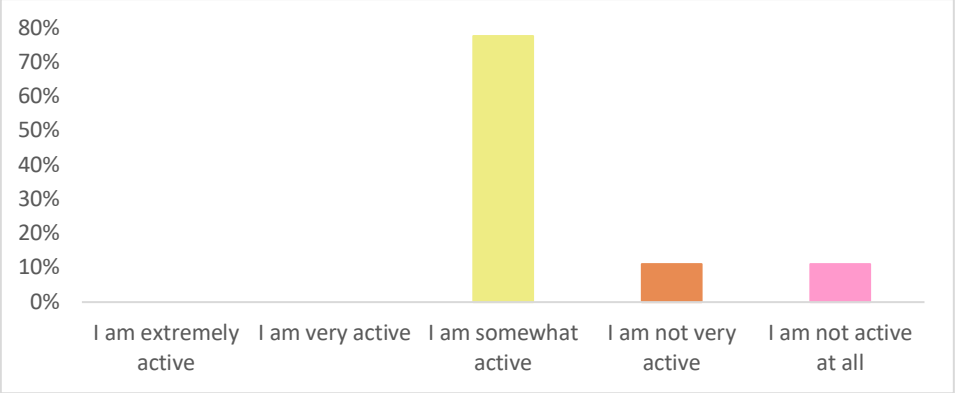

Figure 52 - Levels of traffic activism among Spain's survey respondents (N=9)

Survey respondents stated they did not act on WeCount data (N=6; 67%), or at least they were still thinking about acting (N=3; 33%) . However, two interviewees revealed they became more active as a result of the project while the majority of the others stated they did not as are already taking significant steps to improve traffic-related issues in their area through personal or professional interests.

> *I was aware about the problem, but the lack of the right tools and knowledge did not allow me to implement the project, but with WeCount I was able to do it. Not only that, I also explained it to others next to me which I think it is very important hence many people are concerned about the traffic and pollution problems. Still* ***you need a tool or a sensor to measure it at your exact location; otherwise everything remains as sensations*** *because there are no data to backup those sensations and to guide you in the direction to act upon at street, district and city levels most probably.* (MADCitizenInterview04)

D4.1 Part A provides further evidence as to the actions taken by citizens, thus highlighting the lack of representativeness in the survey findings. Throughout the project effort was made to empower citizens to act on the data. In addition to training citizens to observe and analyse the data, successful examples of change enabled by citizen science actions were shown during kick-off workshops to inspire participants as to what is possible.

Three types of action towards reaching policy makers emerged during the project: actions and future activities co-designed together with participants at the participatory data analysis and awareness workshops; actions the case study leaders undertook and plan to carry out to connect with the policy domain and to transfer the knowledge and findings to relevant stakeholders; and actions carried out independently by WeCount communities to pursue their own interests and, sometimes, existing agendas (see D4.1).

Two thirds of survey participants stated they are **still counting** (N=4), and one third are not (N=2). As the project has now ended, case study leaders suggest that current active counters may be indicative of an ongoing willingness to work with the data (see D4.1). The reasons why participants in the survey stopped counter was because they had technical issues, with one also stating that they moved house and have not set up a Telraam at their new residence.

Six of the nine respondents (67%) are not sure whether to continue to work with WeCount data, whereas two (22%) are certain they will and one certain they will not (11%). One person that was

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unsure about their willingness to continue with the data was certain that they would like the data to influence change, although they made no reference to who should be responsible for acting:

> *I would like my data to be used for actions that improve mobility and reduce air pollution and noise.* (MAD06, Female, Counting Citizen)

COVID-19 impact (Citizens' perspectives)

Lockdown restrictions impacted on every aspect of the WeCount project. All case studies had to redesign their engagement strategies and in-person events that would have brought together and motivated citizens had to be cancelled. In Madrid and Barcelona for instance, a 'city safari', designed to spark doorstep conversations with counters, never materialised. It is believed that COVID-19 restrictions also impacted on the potential knowledge gained (see D4.1, Part A). For instance, both a knowledge exchange event between industry and participants and workshops with hands-on activities to allow participants to assemble the sensors themselves had to be cancelled.

The majority of respondents in Madrid and Barcelona agreed that their time on the project had been adversely impact, stating they **would have preferred face-to-face interactions** (N=6; 60%) (Figure 53). For each of the other four categories selected, the response rate was 1 (10%).

> *When participating in a study that requires tools gathering and a direct feedback from the project organisers, you may get further involved, especially if get-together events take place and you get to know other participants, which results in a sense of community*
> (MADCitizenInterview01)

Cognitively, it is harder to build community online (Nilson & Goodson, 2018). For the case study leaders for instance, their process of engagement became more convoluted with several additional steps, emails, and forms that had a bearing on sustaining motivation, i.e. **numbers dropped off** significantly after each step (see D4.1).

Saying that, while most people desired physical meetings, some participants in Madrid and Barcelona felt that the **online sessions were well run**, still allowing people to share experiences (MADCitizenInterview04) and did have some advantages to allow participation for older or disabled people.

> *It has been very convenient and appropriate. I understand how important it is to meet you etc. but I am a little bit too old and for young people that would be a very nice experience, but being able to accomplish this from home without having to go out is so very convenient.*
> (MADCitizenInterview02)

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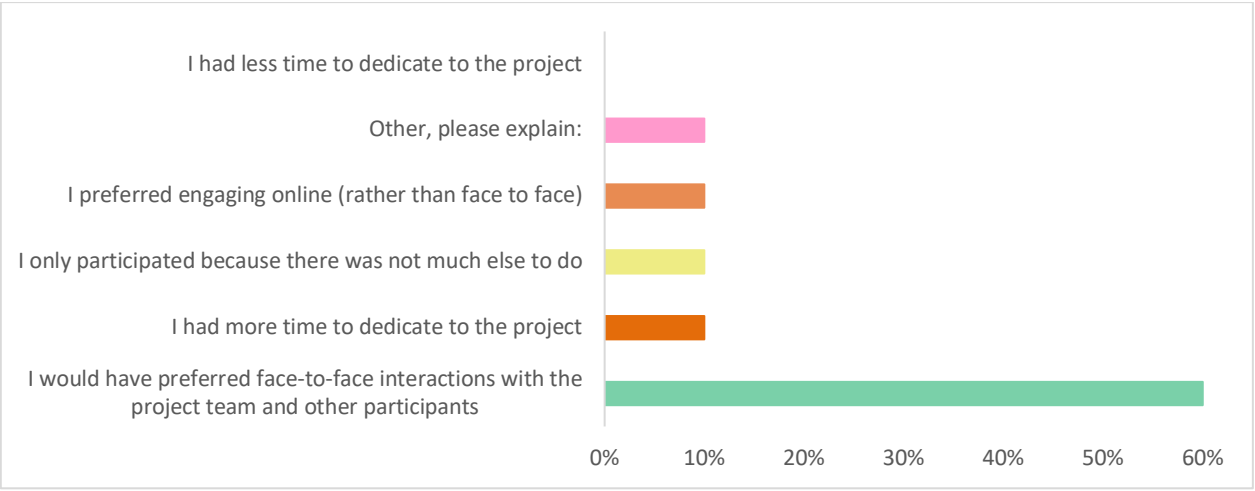

Figure 53 - Impact of COVID-19 on WeCount experience among Spain's survey respondents (N=10)

Improvements

Respondents stated several aspects of the WeCount project that could be improved. '**A mechanism to show if efforts were impactful/successful**' and **improvements to the technology** were the most commonly selected, both selected 4 times (27%) from a list of closed questions (Figure 54). These areas in need of improvement were also ranked one and two, respectively, in Leuven. Reducing the amount of work required and making it easier to understand the data were joint second (N=2; 13.3%, each).

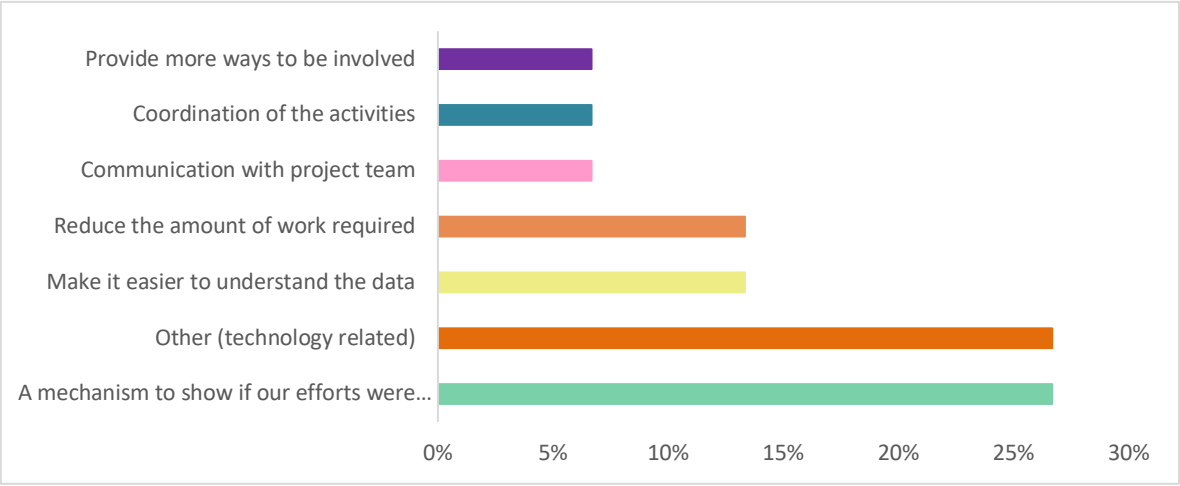

Figure 54 - Improvements for next time, according to Spain's survey respondents (N=15)

Reflecting these suggestions, two respondents stated that they thought the data collected was inaccurate. Looking more deeply at the open question responses, we found four comments regarding **data inaccuracy**, with one for each of the following: technical issues (i.e. unstable network), the sensor miscounts certain transport modes (e.g. motorcycles for bikes) or does not count at night, and the data does not correspond to observations. These types of comments were also mentioned in Leuven, further emphasising the need to work on these areas.

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Survey respondents and interviewees largely thought communication from the project team to be smooth and at the level appropriate, without being overwhelming. A few interviewees however did mention that they sometimes felt there were too many people to contact and that not all communication was clear. Effort was made by the Spanish team to simplify communications and support participants to understand the data (D4.1, Part A) although as mentioned in the following section, this mixed review is understandable.

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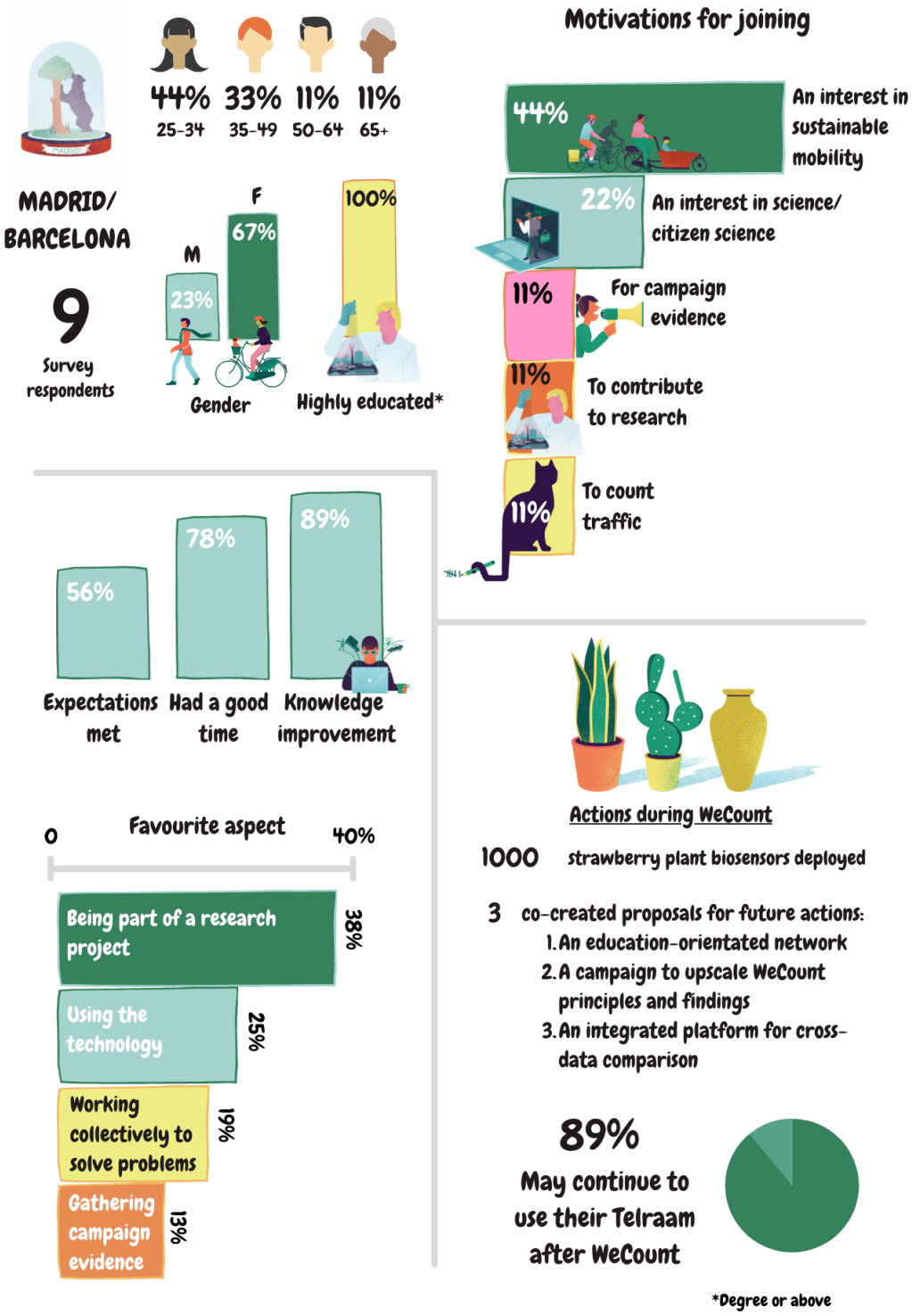
5.4.2.4 Summary of Citizen's experiences of WeCount in Madrid/Barcelona



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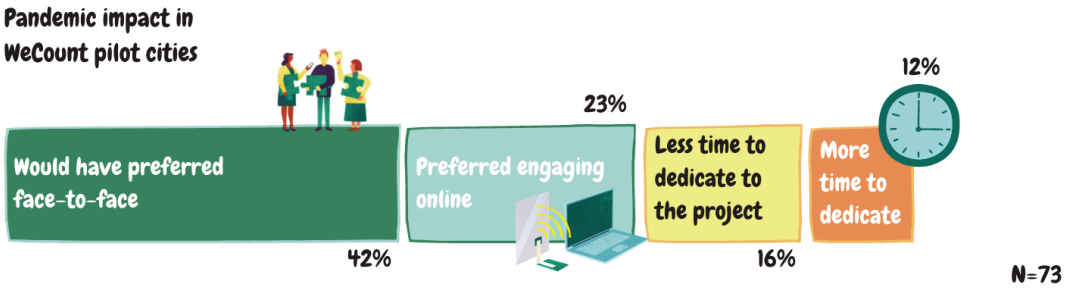
5.4.2.5 Summary of impacts of the pandemic in Leuven and Madrid/Barcelona



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6 Reflections

6.1 Leuven

Survey respondents (N=91), while we do not think are fully representative of all citizens in WeCount Leuven, do give insight into who was involved and how the project was perceived by its participants. The demographic profile and motivations for joining are typical of citizen science projects. Largely, participants enjoyed their time (77%; N=71) and motivations were satisfied (66%; N=61), with their favourite part of WeCount being contributing to a research project (33%; N=51) and using the technology itself (19%; N=29). Online support during the course of the project was somewhat satisfactory (42%; N=77[3] average), although it is worth bearing in mind given this was one of the pilot cities there will always be aspects in need of improvement. Of those that looked at the data, the majority of survey respondents were not surprised by what they saw (51%; N=37) and their opinions on local traffic-related issues has not been changed (64%; N=53); this, we believe, is partly explained by the sense of validation participants experienced when the data they saw matched their pre-conceived beliefs about the traffic situation on their street. For those that were surprised, some of this related to a disbelief about the accuracy of the Telraam. Data accuracy was further brought into question when directly asked. The majority 68% (N= average 46) of participants experienced some degree of knowledge improvement, thus achieving Objective 5. About 25% of participants (N=19) felt their feelings about where they lived had changed as result of involvement in WeCount but we are not sure why. The majority of participants are currently quite inactive on these issues, although we think the Lockdown restrictions may have a part to play here. 13% (N=11) of respondents have acted on WeCount data although we imagine more will act following upcoming Data Analysis Workshops. The fact that 45% (N=38) of respondents want to continue working with the data in the future, even though the project has more engagements to come, is indicative of the appeal of this project to those involved.

From this summary it is clear to see that there is a lot that can be learnt from this to help future iterations of the project. On the technology-side, some improvements were made focussing on sensor stability and ease of installation before the launch of the other three case studies. It will be interesting to check the evaluation results from Cardiff, Dublin and Ljubljana, to see if these changes have had a positive effect on participants experience with the technology.

Lockdown restrictions of course played a part in these results (e.g. limiting ways to be involved and connect, and delaying the Data Analysis Workshops, which is intended to spark local action), however the technology performed as it did regardless of the pandemic.

6.2 Madrid/Barcelona and overall themes from both pilot cities

Unfortunately, the small sample size of the Madrid and Barcelona case study makes cross-comparison of the survey data impossible. However, when combined with additional data collected during the course of the project helps to paint a more complete picture of the situation in these Spanish cities.

[3] Note that this was based on four different types of support, or a total of 212 total entries for this question.

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Given the findings largely reflect Leuven we can draw out some general themes. **Across both cities, participants largely enjoyed their time** (over 75%) and their expectations were on the whole satisfied (over 55%). Participants joined due to their **interest in sustainable mobility** and their **demographic profile largely corresponds to citizen science projects** (with Spain's cohort slightly skewed towards younger citizens). **Both being part of a research project and the technology itself were citizen's favourite** part of WeCount. The majority of citizen's perceived **some degree of change to their knowledge** on traffic related issues (over 68%), with more than 25% and 35%, respectively, believing their feelings about where they live and opinions on traffic-related issues had changed. When it comes to the technology itself, more neutral or negative experiences were highlighted. **Only about half of respondents across both cities rated the Telraam data as good or very good**. Those that saw the data expressed **mix reactions**, although the majority commented that their selection was chosen based on either that the data **validated their feelings** or caused them to **question the sensor's accuracy**. Despite these concerns, there is **a willingness by some citizens in both cities to continue working with the data** and both cities have documented examples of where **citizens have acted** on the data to change the liveability of their street.

6.3 Meeting evaluation objectives

While it is too early to fully answer our research questions, a picture is beginning to emerge in the pilot cities. These are just preliminary results from the pilot case studies and do not represent the full reach of the WeCount project. These two case studies were exploratory by nature and one of the key goals was to improve the technology as well as the methodology to inform the remaining case studies. In Leuven and Madrid/Barcelona both the case leaders and participants had to deal with different versions of the technology, the process, the visualization, while the engagement methodology was being co-developed with the participants. Work is underway to improve the Telraam (D3.2).

Research question 1: Are we engaging citizens who provide meaningful representation of local populations (gender, social deprivation, education, income etc.)? First, neither city was able to establish a meaningful representation of the local population. In addition to both cities choosing not to capture certain demographic information [mainly for cultural reasons and the feeling it would not sit well with participants having to answer those questions], the pandemic severed plans to recruit and engage certain groups (see below).

Research question 2: Are the tools/technology sufficiently robust, yet engaging and simple to use? The technology, while engaging, with reports of people frequently checking the platform and sharing their findings, for many it was not perceived to be as simple to use. The installation process was a challenge, as too was finding a reliable connection. Beyond these rather easy fixes, the level of technical comprehension required by citizens was seen by some as too much. Thus, rather than lowering the technology threshold, in some instances it further excluded people. Perhaps the success of the strawberry plant biosensor lies in its relatability and simplicity; with just a little water and sunlight citizens were able to contribute to research and get strawberries in return.

Research question 3: Are the data generated and the engagement activities being used by citizens themselves? As mentioned, there are glimmers of hope in that the data generated is being

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used by citizens to initiate neighbourhood conversations, spark meaningful dialogue with authorities and lead to more lasting interventions and policy change. There are perhaps many more actions undocumented as already active citizens and local action groups are making use of WeCount data without our knowledge. However, with questions remaining over data accuracy, work is needed to ensure WeCount can be perceived by all as a credible citizen science project.

Research question 4: Are new WeCount communities emerging that are self-sustaining with minimal central support? It is less clear whether new communities are emerging that are self-sustaining with minimal central support. However, as mentioned in Spain, not all citizens have been forthcoming about actions they have taken with WeCount data. In D5.4 we will attempt to dig deeper into this aspect of WeCount to see if we are able to shed more light on citizen self-organisation.

An answer to **research question six (How can we optimize recruitment, engagement, monitoring and evaluation of future citizen science mobility projects?**), optimisation of citizen science recruitment, engagement, monitoring and evaluation, will be fully explored in D5.4. However, a few takeaways have emerged from our analysis:

- Recruitment and engagement did not go as planned due to the pandemic. Strategies to recruit low socio-economic groups and marginalised communities, based on previous experience on what works, had to be scrapped in favour of ad hoc engagements with community intermediaries. Unable to get to know the project team and their ideas through face-to-face engagements or gather together at community centres to work with the data using the organisations laptops, citizens from more diverse backgrounds failed to materialise.
- WeCount suffered due to not being able to create or sustain lasting human connections as effectively as they had hoped. In-person workshops or face-to-face interactions with researchers when they were allowed created rare opportunities to build community and ignite passions; although as time passed and the memories of the buzz created by these gathering faded motivations waned. This is an all too common occurrence for online projects. It is well documented that high dropout rates and low performance is common in online learning (Soeiro, 2015), with communities often struggling to get off the ground or actively participate in the same way as with offline engagements (Nilson & Goodson, 2018).

6.4 General reflections

6.4.1 Citizen science: for and by whom

Citizen science projects have thrived during the pandemic (Wilthers, 2020), however it is less clear *who* has been involved. Given the shift to fully online engagement, it is likely that any marginalised communities that may have taken part were no longer able to participate (e.g. due to a lack of digital skills or a computer). However, given the technology focus of this project, it has the potential to exclude anyone uncomfortable with technology unless it can be properly explained and contextualised (which face-to-face engagements at public events and community building can/and could have helped to resolve).

Effort was made to engage marginalised/deprived communities in WeCount (Objective 3), without much success. Significant personal barriers often mean these groups of society are unable to take a

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more active role in their community, and they face social problems (e.g. housing, language barriers, transient) that cannot be solved by community action alone (Cameron et al. 2015). At the same time, there can be regeneration fatigue as multiple organisations move in to help these communities (ibid). Thus, even if there was not a pandemic to content with, it is not a given that representation from these groups will increase.

6.4.2 Diffusion of innovation

Due to the novelty of Telraam, the profile of citizens on WeCount may reflect the "innovators" or "early adopters" phases of the diffusion of innovation (Figure 55). Typically, these groups of people are radical, vocal and already in support of the idea. The case of veganism is a well-known example that started on the margins with people perceived as othered "tree huggers" before becoming viral through social media and its health and environmental benefits communicated globally through documentaries. Once it became commercial, i.e. you could buy into the lifestyle with fake meats etc, the early majority joined the proverbial band wagon.

For one of the pioneers on the Leuven Kessel-Lo pilot, the timing was right for them, with their neighbour having recently filmed their street and slowed down the footage to count the traffic:

> *This was a hot item in our street [at the time]. It was a great moment to [count traffic] in a more professional and automatised manner so that the neighbour didn't have to do that; it was also not allowed… to film the public roads [without a reason]. It was good timing for us. I would have done it either way, also if there were no problems in the street or no rat running. Simply out of interest.*
> (LEUCitizenInterview04).

Due to its novelty, it is likely Telraam would fail to meet the project's diversity objectives, regardless of its technical kinks and the pandemic. Community development takes a lot of time, and this is something the project was lacking. Thus, it is recommended that in addition to working to improve the technology to ensure that the early majority are comfortable in taking Telraam "off the shelf" to use at home, more time and energy needs to be invested in working with community organisations in areas of multiple deprivation and reaching out to people of lower socioeconomic status (such as suggested coffee bars and on the street) to enable these marginalised groups to tell staff how they want to measure, monitor and act on transport and mobility issues (which the Spanish case study went some way towards achieving).

WeCount was not just about Telraam; by its very name, the project sought to include citizens of all kinds in the counting of traffic-related variables. These opportunities to use something other than Telraam became available later in the pilot projects life cycle, and as the strawberry plant campaign has shown, proved extremely successful. Perhaps this was due to the familiarity of the object or the simplicity of the message. Further research would need to be carried out to draw any conclusions on this. Either way, this is an important lesson for future citizen science projects looking to broaden their appeal; in addition to on-the-ground partnership building with community organisations, citizen science projects need to offer a variety of tools, digital and physical, for citizens to sense their environment. Having a tangible hook can draw people into the project; but what that object is and how it is communicated will affect its effectiveness in recruiting participants.

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Figure 55 - The Diffusion of Innovation Curve. Source: City & Guilds

6.4.3 Communication

The amount of communication a participant would like will vary from person-to-person. The COVID-19 pandemic forced most of the world online so even the most information-hungry person may have experienced information overload during this time. WeCount did not have any other choice but to increase the amount of email communications. Some information that would have been communicated during in-person workshops had to be done via email, and information that may have otherwise been perceived as a welcome project update may have proved additional noise during this trying time. As such, while it is worth acknowledging the comments about too much information, it is worth remembering online communication was far higher than originally anticipated.

Nonetheless as a large project, with technical support in one country and facilitators in another, there may have been times when citizens did not know where to look for information, and this should be reflected upon for future iterations of the project. In D5.4 we will see if information overload was also perceived by staff; as a multi-national project it is much harder to avoid digital communication with staff, however they were deprived of the opportunity for face-to-face annual meetings, which may have been testing to their own motivations with the project.

6.5 Next steps

With the feedback received through the online platform, work is already underway to update the Telraam device so it no longer needs cables or Wi-Fi access. A night camera is also being explored. Data accuracy needs the most amount of attention and it is recommended that this be worked through before plans for further expansion of the Telraam sensor. Complementing Telraam data with information from other sensors or citizen 'ground truthers' and data pre-COVID has been suggested, available through interim reporting. This may create a more realistic picture of traffic and mobility issues in cities, motivate participants to keep counting, and also widen the appeal to citizens not interested in or knowledgeable about traffic sensor technology. This is already being explored in forthcoming case studies.

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Case studies in Cardiff and Dublin had planned to take on board some of the feedback contained within D5.2 but given the change of plans due to the pandemic, this has not been possible. D5.4 will offer more detailed steps forward for future citizen science projects and has already produced guidance on recruiting and engaging participants in times of crisis (see appendix). The engagement arm of TML (Telraams creator) is fully aware of the value of face-to-face engagements and hopes to shift to in-person events when possible. They will also be taking onboard ideas on how to broaden the demographic profile of participants.

Communication was an issue for some participants, although given the unusual context we find ourselves in, and the newness of the project, this is understandable. Nonetheless, future projects may also benefit from telephone or teleconferencing support to create human connections between researchers and participants and resolve problems faster. Q&A sessions are already being trialled in Leuven to do just that. Feedback from one professional stakeholder informed the WeCount team that while their project counts traffic it does not include citizens – to them the addition of citizen counters is a huge added value.

Lastly, it is worth reiterating that these surveys were carried out while the project was still active and, in Leuven, before the data analysis workshops had taken place. We believe this may have had a bearing on the number of respondents reporting that a mechanism to show impact was needed – i.e. because that mechanism had not been deployed yet.

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8 Appendices: Evaluation Toolkit

8.1 Information Sheet

City Case Study Lead Contact details

e.g. Professor Enda Hayes
University of the West of England, UK
enda.hayes@uwe.ac.uk

WeCount: Citizens Observing Urban Transport

You are being invited to take part in this project and research study as a resident of Cardiff. Please do ask us if there is anything that is not clear or if you would like more information, using the details above.

WeCount is a citizen science project, providing citizens with the tools to measure traffic and footfall on your street.

You will be asked to install a Telraam device on your window, which will count traffic passing by your house/workplace. The Telraam device data is compiled from five cities across Europe: Cardiff, Dublin, Leuven, Ljubljana, and Madrid. Data from the device does not store any visual information on your street or specific location, and will be stored on a secure server meeting EU General Data Protection Regulation (GDPR) conditions. We do not foresee any risks from participating in this project.

Each city will then use this data to discuss traffic issues relevant to each city. This may include car vs bike traffic, traffic speed, air pollution, and road improvements for active mobility.

You will be asked to take part in up to three (online) workshops discussing with other participants about your experience and opinions on traffic on your street, as well as how you found using the Telraam device. The workshops will take 1-2 hours and will be 6 months apart; the workshops will be audio recorded. You will also be asked to give your opinions on participation in the project through online surveys.

All personal details will be stored securely and separately to your opinions according to the GDPR code. Your personal comments will not be identifiable to you and will be grouped thematically with other participants for reporting. Overall outcomes from the project will be published in reports to the European Commission, on the WeCount website, in academic journals and conferences, and through wider media.

It is up to you to decide whether or not to take part. If you do decide to take part you will be given this information sheet to keep and asked to give your consent regarding the use of the information that you provide. If you decide to take part you are still free to withdraw up until the city case study closes.

Thank you for your time.

This study was given ethics consent by the Faculty Research Ethics Committee of the University of the West of England, UK, on behalf of the European Commission: researchethics@uwe.ac.uk

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8.2 Information Sheet (Interviews)

Dr Margarida Sardo
University of the West of England, UK
margarida.sardo@uwe.ac.uk

WeCount: Citizens Observing Urban Transport

You are being invited to take part in this research interview as a community member. Please do ask us if there is anything that is not clear or if you would like more information, using the details above.

WeCount is a citizen science project, providing citizens with the tools to measure traffic and footfall on your street.

You will be asked to take part in up to two interviews and possibly complete a reflective logs about your experience and opinions on running the Telraam devices and city case study. The interviews will take half an hour and will be 6 months apart; the interviews will be audio recorded. Reflective logs will be sent to you via email.

Your personal comments will not be identifiable to you and will be grouped thematically with other participants for reporting. All personal details will be stored securely and separately to your opinions according to the GDPR code. Overall outcomes from the project will be published in reports to the European Commission, on the WeCount website, in academic journals and conferences, and through wider media.

It is up to you to decide whether or not to take part. If you do decide to take part you will be given this information sheet to keep and asked to sign a consent form regarding the use of the information that you provide. If you decide to take part you are still free to withdraw up until May 2021 when we start report writing.

Thank you for your time.

This study was given ethics consent by the Faculty Research Ethics Committee of the University of the West of England, UK, on behalf of the EU Commission: researchethics@uwe.ac.uk

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8.3 Interview schedule (citizens)

Notes for interviewers:

- *Make sure participants read the information sheet and that you obtain written consent **prior** to commencing the interview.*
- *Each interview has an unique reference. The interview reference is written in the top right corner of the interviewee's consent form (or similar in the digital format); quote this at the start of each interview (during recording). For example: Madrid01 could be the reference for the first interview with a citizen from the Madrid Case Study.*
- *Ask: Can I please start recording?*
- *If the participant gives consent, press record and read the interview unique reference.*
- *Along with asking questions from either section A, B, C or D, please also ask the questions in section E for each participant*

Thank you very much for agreeing to participate in this interview. It won't take very long and I'd appreciate it if you could be as honest as possible regarding your views and thoughts about the WeCount project. There are no right or wrong answers and we are really interested in capturing your thoughts and views.

Let's start by thinking about your involvement in the WeCount project. Which of the following best describes your involvement:

- → I am counting traffic with a Telraam (go to section A)
- → I am counting traffic/collecting data without a Telraam (go to section B)
- → I am a local champion (go to section C)
- → I took part in an event but don't have a Telraam (go to section D)
- → I am involved as a professional stakeholder (go to section E)

--- SECTION A ---

For counting citizens (with a Telraam/manual counting)

1. Can you please explain how you originally got involved in the WeCount project? What motivated you to be a part of WeCount?

2. Overall, how have you found it being involved? Has it lived up to your expectations?

3. And what have been some of your highlights? The most positive aspects of being involved?

4. From your experience, what aspects of the project do you think could be improved? (e.g. technology, communication)

5. What has been your experience been of using the digital technology? (e.g. the Telraam devise, website and dashboard)

6. What did you think of the data you found?
    a. Do you hope to do anything with the data? (please explain)

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7. How active around traffic-related issues in your street/neighbourhood would you say you were before WeCount?

8. Has your involvement in WeCount changed your level of activity?
    a. In what way?

9. Has your opinion changed about traffic related-issues in your street or neighbourhood? (please explain)

10. Do you have plans to continue using the Telraam now that the project has ended? (please explain)

--- GO TO SECTION E ---

--- SECTION B ---

For involved citizens (without a Telraam)

1. Can you please explain how you originally got involved in the WeCount project? What motivated you to be a part of WeCount?

2. In what ways were you involved in the project?

3. Overall, how have you found it being involved? Has the project lived up to those expectations?

4. And what have been some of your highlights? The most positive aspects of being involved?

5. From your experience, what aspects of the project do you think could be improved?

6. Can you explain why you didn't have a Telraam?

7. Did you find out about the data collected from your area?
    a. (if yes,) …What did you think?
    b. Do you hope to do anything with the data? (please explain answer)

8. How active around traffic-related issues in your street/neighbourhood would you say you were before WeCount?

9. Has your involvement in WeCount changed your level of activity?
    a. In what way?

10. Has your opinion changed about traffic related-issues in your street or neighbourhood? (please explain)

11. Do you plan to remain involved in local action on traffic-related issues (or similar) now that the project has ended? (please explain)

--- GO TO SECTION E ---

--- SECTION C ---

Questions for local champions

1. Can you please explain how you originally got involved in the WeCount project? What motivated you to be a part a local champion?

2. In what ways were you involved in the project (what were your main responsibilities)?

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3. Overall, how have you found it being involved? Has the project lived up to those expectations?

4. And what have been some of your highlights? The most positive aspects of being involved?

5. From your experience, what aspects of the project do you think could be improved?

6. What has been your experience been of using the digital technology? (e.g. the Telraam devise, website and dashboard)

7. Did you find out about the data collected from your area?
    a. (if yes,) …What did you think?
    b. Do you hope to do anything with the data? (please explain answer)

8. How active around traffic-related issues in your street/neighbourhood would you say you were before WeCount?

9. Has your involvement in WeCount changed your level of activity?
    a. In what way?

10. Has your opinion changed about traffic related-issues in your street or neighbourhood? (please explain)

11. Do you plan to remain involved in local action on traffic-related issues (or similar) now that the project has ended? (please explain)

--- GO TO SECTION E ---

--- SECTION D ---

Questions for local policy-makers and stakeholders

1. Can you please explain how you originally got involved in the WeCount project? What motivated you to be a part of WeCount?

2. In what ways were you involved in the project?

3. Overall, how have you found it being involved? Has the project lived up to those expectations?

4. And what have been some of your highlights? The most positive aspects of being involved?

5. From your experience, what aspects of the project do you think could be improved?

6. Did you have a Telraam? If no,
    a. Can you explain why you didn't have one?
    b. Would you have liked to have had one if you could?

7. Did you find out about the data collected from residents?/what did you find out from your dataset?
    a. (if yes,) …What did you think?
    b. Do you hope to do anything with the data? (please explain answer

8. How active around traffic-related issues in your street/neighbourhood would you say you were before WeCount?

9. Has your involvement in WeCount changed your level of activity?

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a. In what way?

10. Has the project influenced your work in any way? (e.g. provided evidence, enhanced community connections, improved understanding, etc)

11. Has your opinion changed about traffic related-issues in your city? (please explain)

12. Do you plan to remain involved with WeCount (staff, technology) or the citizens involved now that the project has ended? (please explain)

--- GO TO SECTION E ---

--- SECTION E ---

We are almost done, only a few more questions to go.

What is your age (in years): 16-24; 25-34; 35-49; 50-64; 65+; Prefer not to say

What is your gender: Male; Female; Other ; Prefer not to say

What is your highest level of education? School leaver certificate; Technical qualifications; Undergraduate degree; Postgraduate degree; Doctoral degree; Prefer not to say

Is there anything else you would like to add about the WeCount Project?

Thank you very much for your time and feedback, it's very much appreciated. Have a good day.

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8.4 Focus groups (workshops)

Kick-off Workshops Only
You need to ask the participants the following five questions. We strongly suggest you record the discussion of the first two questions in a focus group/breakout groups to obtain rich qualitative data from participants. The remaining questions can be recorded, asked using Mentimeter/Slido or similar, or using a paper questionnaire at a live event, or via email after the workshop. Please save the audio files in your evaluation folder and transfer responses to 3-5 into Template D afterwards.

1. What are you hoping to address in your community through using a Telraam?

2. After the workshop, do you feel confident enough to understand (and explain to your neighbours) about WeCount and the Telraam data?

3. Why do they want to have a Telraam?

Please circle any that the workshop participants mention – if more than one person mentions them, use a tally count.

People use my area as a rat run	Our community is not safe	I want to monitor cars speeding	I want to get an idea of local air quality	I love tech
I want to encourage cyclists	I want to encourage walkers	I will use the data to lobby local policymakers	I will use the data for my school or group	Other - notes

4. **In general, how did you like the workshop/this event?**

Please use a tally count to provide numbers of responses to each option.

Positive (4)
Neutral (3)
Negative (2)
Very negative (1)

5. **Do you feel your input was appreciated?**

Please use a tally count to provide numbers of responses to each option.

Yes, very much (5)
Yes, a little bit (4)
Neutral (3)
No, not so much (2)
No, not at all (1)

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8.5 Online survey (citizens)

TEMPLATE H: Final online surveys

Note: Online surveys were set up online using Qualtrics. The template shared here showcases the content of the surveys, not the style and formatting.

We would like to evaluate your recent experience with the WeCount project through a few questions, which will take no longer than 15 minutes to complete and will help us improve future projects.
We will hold your data securely and confidentially. If you have a Telraam, your views will be linked to your original Telraam information, however all comments will be anonymised and grouped together for reporting so you are not identifiable.
Completing this survey indicates that you give consent for this data to be used in this research study.
Thank you for your time.
This study was given ethics consent by the Research Ethics Committee of the University of the West of England, UK. For information on the research please contact margarida.sardo@uwe.ac.uk

Section A: Your involvement
Choose the option that best describe your involvement in WeCount: (L)
I have a Telraam (Counting Citizen) -> go to Questions for counting citizens)
Please provide your Telraam number:
I live in a neigbourhood where traffic counting took place but I don't have a Telraam myself -> go to Questions for involved citizens
I have been facilitating community conversations and championing the project (with or without a Telraam) -> go to questions for local champions
Please provide your Telraam number:
I took part in an event but I don't have a Telraam
I am not involved as a citizen but as a professional stakeholder (researcher, member of the Council, etc) and took part in some events -> go to questions for 'stakeholders' (local policy makers and stakeholders, techies and local geeks)

Section B: questions for different participant groups

Questions for Counting Citizens
About the WeCount project:
What motivated you originally to participate in the WeCount project? (L)
I wanted to count traffic
I wanted to contribute to research
I want to make a difference in my local area
I am interested in sustainable mobility in general
I am interested in technology for good
I am interested in the science/citizen science
My neighbour/family asked me personally/told me about it
Other. Please specify:_____

Overall, how would you rate your experience in the WeCount project: (L)
Excellent (5)
Very Good (4)
Good (3)
Not good (2)

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Not good at all (1)

What was your favourite aspect about being involved in the WeCount project? (tick all that apply) (L)
Meeting my neighbours
Working collectively to solve problems
Being part of a research project
Feeling as though I am making a difference
Using technology for good
Gathering evidence to support my campaigning
Not applicable
Other (please state)

What aspect about being involved in the WeCount project would you improve? (L)
Communication with project team
Coordination of the activities
Reduce the amount of work required
Provide more ways to be involved
Make it easier to understand the data
A mechanism to show if our efforts were successful/impactful
Other (please state):
_____

How well would you say were your expectations met? (L)
Very well (5)
Quite well (4)
Okay (3)
Not well (2)
Not at all (1)
Please explain your answer: _____

In your opinion, has participating in WeCount improved your knowledge about: (L)

	No improvement at all (1)	Little improvement (2)	Some improvement (3)	A lot of improvement (4)	Extreme improvement at all (5)
Traffic and mobility in general					
Traffic in your street/neighbourhood: where problems are, where are bottlenecks, where can we find good examples, etc.					
The impact of traffic on air quality and traffic safety					
How you can take action					

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about traffic in your area					

1. **How much action would you say you are currently taking with regards to traffic issues in your local area? (this can include talking about the issues to friends or Councilors, campaigning, distributing flyers, hosting events, or other activities) (L)**

Extremely active(5)
A lot of action (4)
Some action (3)
A little action (2)
No action (1)

Please add your Telraam number here:_____(L)

Is your Telraam currently still counting? (L)

1 Yes
2 No
3 I don't know

If not, why did you stop counting? (L)

1 Technical issues that I could not solve myself
2 I didn't want to be involved anymore (please explain)_____
Other reasons _____

Do you think the Telraam sensor is accurately capturing traffic numbers in your street?

Yes
Mostly
Mostly not
No
Don't know
Please explain
…...

In general, how satisfied are you with: (L)

	Did not make use of it (0)	**Not satisfied at all (1)**	**Not very satisfied (3)**	**Satisfied (3)**	**Very satisfied (4)**	**Extremely satisfied (5)**
The instructions on the Telraam website during registration						
The online support by the Telraam-team: FAQ-articles						
The online support by the Telraam-team: helpdesk						
Help from a neighbour, friend, family						
Help on social media (Facebook, Twitter)						

How often do you look at the Telraam dashboard with the traffic data of your and other Telraams? (L)

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I look at the data more than once a week
I look at the data only a few times a month
I look at the data only now and then
I looked at first but then stopped looking after some time
I have never looked at the data
In the Telraam toolkit you may have received printed materials in addition to your Telraam. How useful were these add-ons for you?
- Letter worth explanation about the project and tips to take action

Very useful
Somewhat useful
Not really useful
Not useful at all
Did not use
NA
- Flyers for your neighbours

Very useful
Somewhat useful
Not really useful
Not useful at all
Did not use
NA
- Poster 'here I count' to put at your window

Very useful
Somewhat useful
Not really useful
Not useful at all
Did not use
NA
Do you have any suggestion to make this toolkit better?

How do you rate the following data sources? (L)

	Rating scale (1-5) **0 Did not use** **1 very poor; 2 poor, 3 ok; 4 good; 5 very good**
Own data on the map on www.telraam.net	
Own data in the excel on my dashboard	
All data on the map on www.telraam.net	
The Telraam Api: https://telraam-api.net/	
Background information on the FAQ (eg how the classification work): https://telraam.zendesk.com/hc/nl	

Thinking about the WeCount/Telraam data for your street or area: (L)
It surprised me a lot
It surprised me a little
It was what I expected
Not applicable/ didn't look at the data
Please explain your choice:_____

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Has WeCount changed your overall opinions about traffic-related issues?

	No (1)	**My opinion changed a little (2)**	**My opinion changed a lot (3)**
In your street			
In your neighbourhood			

Has your involvement in WeCount changed how you feel about where you live?
Yes/No
Please explain...

Did you take any action based on Telraam data?
Yes
No
Not yet, but I am thinking about it.
If yes, please state what action:

Now that the project has ended, will you continue to work with the WeCount data and/or research team:
Yes
No
Not sure yet

If you have anything to add about the WeCount project please add your comments here:

Thank you.

Questions for Involved Citizens
About the WeCount project:
What motivated you originally to participate in the WeCount project? (L)
I wanted to count traffic
I wanted to contribute to research
I want to make a difference in my local area
I am interested in sustainable mobility in general
I am interested in technology for good
I am interested in the science/citizen science
My neighbour/family asked me personally/told me about it
Other. Please specify:_____

Overall, how would you rate your experience in the WeCount project: (L)
Excellent (5)
Very Good (4)
Good (3)
Not good (2)
Not good at all (1)

What was your favourite aspect about being involved in the WeCount project? (tick all that apply) (L)
Meeting my neighbours
Working collectively to solve problems
Being part of a research project
Feeling as though I am making a difference

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Using technology for good
Gathering evidence to support my campaigning
Not applicable
Other (please state)

What aspect about being involved in the WeCount project would you improve? (L)
Communication with project team
Coordination of the activities
Reduce the amount of work required
Provide more ways to be involved
Make it easier to understand the data
A mechanism to show if our efforts were successful/impactful
Other (please state):
_____

How well would you say were your expectations met? (L)
Very well (5)
Quite well (4)
Okay (3)
Not well (2)
Not at all (1)
Please explain your answer: _____

In your opinion, has participating in WeCount improved your knowledge about: (L)

	No improvement at all (1)	Little improvement (2)	Some improvement (3)	A lot of improvement (4)	Extreme improvement at all (5)
Traffic and mobility in general					
Traffic in your street/neighbourhood: where problems are, where are bottlenecks, where can we find good examples, etc.					
The impact of traffic on air quality and traffic safety					
How you can take action about traffic in your area					

How much action would you say you are currently taking with regards to traffic issues in your local area? (this can include talking about the issues to friends or Councilors, campaigning, flyering, hosting events, or other activities) (L)
Extremely active(5)
A lot of action (4)
Some action (3)
A little action (2)

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No action (1)

How were you involved in the WeCount project?
I counted manually
I attended a workshop or event
Other, please state

Why did you not have a Telraam?
Window not suitable
Not interested in the technology
Data privacy concerns
I don't think I would be able to install it / I'm no good with technology
There is no Telraam network active in the place where I live
Other, please state

Did you find out about the data collected from your area?
Yes/No
(if yes) What did you think about the findings?
It surprised me a lot
It surprised me a little
It was what I expected
Not applicable/ didn't look at the data

(if yes to above) Did you take any action based on Telraam data?
Yes
No
Not yet, but I am thinking about it.
If yes, please state what action:

Has WeCount changed your overall opinions about traffic-related issues?

	No (1)	**My opinion changed a little (2)**	**My opinion changed a lot (3)**
In your street			
In your neighbourhood			

Has your involvement in WeCount changed how you feel about where you live?
Yes/No
Please explain...

Now that the project has ended, will you continue to work with the WeCount data and/or research team:
Yes
No
Not sure yet

If you have anything to add about the WeCount project please add your comments here:

Thank you!

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Questions for Local Champions

What motivated you originally to participate in the WeCount project? (L)

I wanted to count traffic
I wanted to contribute to research
I want to make a difference in my local area
I am interested in sustainable mobility in general
I am interested in technology for good
I am interested in the science/citizen science
My neighbour/family asked me personally/told me about it
Other. Please specify:_____

Overall, how would you rate your experience in the WeCount project: (L)

Excellent (5)
Very Good (4)
Good (3)
Not good (2)
Not good at all (1)

What was your favourite aspect about being involved in the WeCount project? (tick all that apply) (L)

Meeting my neighbours
Working collectively to solve problems
Being part of a research project
Feeling as though I am making a difference
Using technology for good
Gathering evidence to support my campaigning
Not applicable
Other (please state)

What aspect about being involved in the WeCount project would you improve? (L)

Communication with project team
Coordination of the activities
Reduce the amount of work required
Provide more ways to be involved
Make it easier to understand the data
A mechanism to show if our efforts were successful/impactful
Other (please state):
_____

How well would you say were your expectations met? (L)

Very well (5)
Quite well (4)
Okay (3)
Not well (2)
Not at all (1)
Please explain your answer: _____

In your opinion, has participating in WeCount improved your knowledge about: (L)

	No improvement at all (1)	**Little improvement (2)**	**Some improvement (3)**	**A lot of improvement (4)**	**Extreme improvement at all (5)**

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Traffic and mobility in general					
Traffic in your street/neighbourhood: where problems are, where are bottlenecks, where can we find good examples, etc.					
The impact of traffic on air quality and traffic safety					
How you can take action about traffic in your area					

How much action would you say you are currently taking with regards to traffic issues in your local area? (this can include talking about the issues to friends or Councilors, campaigning, flyering, hosting events, or other activities) (L)
Extremely active(5)
A lot of action (4)
Some action (3)
A little action (2)
No action (1)

What is your Telraam number?
…
I didn't have a Telraam

How did you become a local champion for WeCount? (L)
It emerged organically during the project
I put my name forward
A friend put my name forward
I was approached by a member of the project team
Other (please explain)…

What were your main responsibilities? (L)
Spreading awareness
Encouraging others to have a Telraam
Organising local events
Providing technical assistance to people with a Telraam
Other (please explain)…

Do you plan to continue as a local champion now that the project is over?
Yes
No
Not sure
Please explain

Thinking about the WeCount/Telraam data for your street or area:
It surprised me a lot
It surprised me a little

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It was what I expected
Not applicable/ didn't look at the data
Please explain your choice:_____

Has WeCount changed your overall opinions about traffic-related issues?

	No (1)	**My opinion changed a little (2)**	**My opinion changed a lot (3)**
In your street			
In your neighbourhood			

Has your involvement in WeCount changed how you feel about where you live?
Yes/No
Please explain...

Did you take any action based on Telraam data?
Yes
No
Not yet, but I am thinking about it.
If yes, please state what action:

Now that the project has ended, will you continue to work with the WeCount data and/or project team:
Yes
No
Not sure yet

If you have anything to add about the WeCount project please add your comments here:
Thank you.

Questions for Local policy-makers & stakeholders
What is your area of work?
Policy
Planning
Research
Business
Other (please explain) ….....

In what ways did you interact with the WeCount project?
I attended public events/workshops
I attended consortium/project meetings
I connected with local participants for my own research/professional interests
I connected the team with local contacts
Other (please explain)

How has the project influenced your work?
Greater community connections
Greater professional connections
It has provided me with evidence to support my work
It has improved my understanding of traffic-related issues
I have shared the projects findings with colleagues
Anything else, please add here:

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Now that the project has ended, will you continue to work with the WeCount data and/or project team:
Yes
No
Not sure yet

Did you take any action based on the WeCount findings?
Yes/no
Please explain ….

If you have anything to add about the WeCount project please add your comments here:

Thank you.

Questions for Professionals, Techies & local geeks

What motivated you originally to participate in the WeCount project? (L)
I wanted to count traffic
I wanted to contribute to research
I want to make a difference in my local area
I am interested in sustainable mobility in general
I am interested in technology for good
I am interested in the science/citizen science
My neighbour/family asked me personally/told me about it
Other. Please specify:_____

Overall, how would you rate your experience in the WeCount project: (L)
Excellent (5)
Very Good (4)
Good (3)
Not good (2)
Not good at all (1)

What was your favourite aspect about being involved in the WeCount project? (tick all that apply) (L)
Meeting my neighbours
Working collectively to solve problems
Being part of a research project
Feeling as though I am making a difference
Using technology for good
Gathering evidence to support my campaigning
Not applicable
Other (please state)

What aspect about being involved in the WeCount project would you improve? (L)
Communication with project team
Coordination of the activities
Reduce the amount of work required
Provide more ways to be involved
Make it easier to understand the data
A mechanism to show if our efforts were successful/impactful

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Other (please state):
_____

How well would you say were your expectations met? (L)
Very well (5)
Quite well (4)
Okay (3)
Not well (2)
Not at all (1)
Please explain your answer: _____

In your opinion, has participating in WeCount improved your knowledge about: (L)

	No improvement at all (1)	Little improvement (2)	Some improvement (3)	A lot of improvement (4)	Extreme improvement at all (5)
Traffic and mobility in general					
Traffic in your street/neighbourhood: where problems are, where are bottlenecks, where can we find good examples, etc.					
The impact of traffic on air quality and traffic safety					
How you can take action about traffic in your area					

How much action would you say you are currently taking with regards to traffic issues in your local area? (this can include talking about the issues to friends or Councilors, campaigning, flyering, hosting events, or other activities) (L)
Extremely active(5)
A lot of action (4)
Some action (3)
A little action (2)
No action (1)

<u>In what ways did you interact with the WeCount project (tick all that apply)?</u>
I offered technical support
I attended a WeCount event
I helped to hack the data
I provided industry connections
I used Telraam data (api) to create an application (or something else?)
Other (please state):

Has WeCount changed your overall opinions about traffic-related issues?

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	No (1)	My opinion changed a little (2)	My opinion changed a lot (3)
In your street			
In your neighbourhood			

Now that the project has ended, will you continue to work with the WeCount data and/or research team:
Yes
No
Not sure yet

If you have anything to add about the WeCount project please add your comments here:

FOR ALL SURVEYS: Section C: About you
Age (year): (L)
1 16-24
2 25-34
3 35-49
4 50-64
5 65+
6 Prefer not to say

Gender: (L)
1 Male
2 Female
3 Other
4 Prefer not to say

What is your highest level of education? (L)
1 School leaver certificate
2 Technical qualifications
3 Undergraduate degree
4 Postgraduate degree
5 Doctoral degree
6 Prefer not to say

We might be conducting additional telephone/online interviews to collect feedback from participants. If you're interested in being interviewed, please leave your email address below:

Thank you for your time and feedback.

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8.6 Reflective log template

TEMPLATE J: Self-Reflective log

Guidance:

1. Take a look at this reflective log **ahead** of your workshop/event.
2. **After you finish** your workshop or event (after participants leave), take 15 min to reflect on how it went. Please log in to your email account or laptop, etc. and complete the self-reflective log.
3. Send your reflections via email to your WP5 Mentor. You will receive a reminder if you forget, don't worry.
4. Please complete the template in English.
5. Please avoid printing the log and filling it in by hand, as it's much harder to extract data from it.

Template:

General information
Event name: **Location:** **Date:** **Time:** **Brief event description (type of workshop/event, duration, online or face-to-face, etc.):** **Communication channel(s) used to reach participants:** **If face-to-face: Brief description of your venue (venue type, atmosphere, etc.):**
Why did people want a Telraam? People use my area as a rat run — Our community is not safe — I want to monitor cars speeding — I want to get an idea of local air quality — I love tech I want to encourage cyclists — I want to encourage walkers — I will use the data to lobby local policymakers — I will use the data for my school or group
Strengths - What went well?
Weaknesses - What didn't go so well?

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Improvements - In your opinion how could the event be improved? What could you have done differently?
Engagement - How easy or difficult was it to engage with the participants? (reflect only on those that apply to your activity) 1. Talk to your participants 2. Get the participants to talk to you 3. To get participants to do the activity
Were the participants knowledgeable? What kinds of knowledge or understanding of the topic did they have?
Please add any other thoughts, comments or reflections about the event.

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