



CitizenCity

D2.1 – Common Engagement Model

WP2	Stakeholder Engagement
Due Date	30/05/2025 -> 06/06/2025
Submission Date	10/06/2025
Responsible Partner	Eindhoven University of Technology
Version	0.3
Status	Final
Author(s)	Dujuan Yang, Milan van Bussel, Kirsten Visser, Bige Tunçer
Reviewers	Mieke van Schaik, Leire Balzategui, Maria Suberbiola, Ari Saine, Golriz Ghonouei
Deliverable type	R: Report
Dissemination Level	Select from PU: Public; SEN:Sensitive; EU-R: EU restricted; EU-C: EU confidential; EU-S: EU-Secret



European data space
for smart communities

Version History

Version	Date	Author	Partner	Description
0.1	6 June, 2025		TU/e	First internal draft
0.2	16 July 2025		TU/e	Second draft
0.3	14 August 2025		TU/e	Final version

Disclaimer

The information, documentation and figures available in this deliverable are written by the CitizenCity pilot project under de DS4SSCC-DEP project's consortium.



Table of Contents

List of Figures	4
List of Tables	4
Glossary	4
Executive Summary	5
1. Aim of the document	6
1.1 Introduction	6
1.2 Structure of deliverable D 2.1	7
2. Literature review of stakeholder engagement methods	8
2.1 Informing Methods (One-Way Communication)	8
2.2 Consultative Methods (Two-Way Communication)	10
2.3 Involve and Collaborate Methods (Two-Way Engagement)	15
2.4 Empowering Methods (Shared Decision-Making)	18
2.5 A Cross-mapping	20
3. Framework of the common engagement model	22
3.1 Plan (Stakeholders mapping)	23
3.2 Design	25
3.3 Implementation	26
3.4 Monitor & Evaluate	26
3.5 Iterate	27
References	29
Appendix A. Stakeholder mapping table	31
Appendix B. Stakeholder engagement strategy Template	32



List of Figures

Figure 1: Kano model's categories of product features (left) and Evaluation of Kano method responses (right). P = performance, A = attractive, M = Must-be, I = indifferent, R = reverse and Q = questionable (Folding Burritos, 2015).	12
Figure 2: Visualization of co-design project structure (Benz et al., 2024)	16
Figure 3: Adapted design cycle for selecting a fitting engagement method, based on the engineering design cycle from (Vale, Barbosa, Peixoto, & Fernandes, 2022).....	21
Figure 4: The framework of the Common Engagement Model.....	23
Figure 5: Example of stakeholders mapping across three levels of involvement.....	24

List of Tables

Table 1: Cross mapping of the 'who', 'when', 'why' and 'how' of stakeholder engagement	21
Table 2: Header of the stakeholder mapping table, to be filled in per use case	24
Table 3: List of engagement methods and their goals per level of engagement.....	25
Table 4: Monitoring and Evaluating indicators of stakeholder engagement efforts.....	27

Glossary

PED	Positive Energy District
NEB	New European Bauhaus
IAP2	International Association for Public Participation
IAP2 Spectrum	A framework that categorizes levels of stakeholder engagement based on influence
DS4SSCC	Data Space for Smart and Sustainable Cities and Communities
..	



Executive Summary

This document is the deliverable D2.1- [Common engagement Model] of the pilot project CitizenCity as one of the projects in round #2 for the Data Space 4 Smart and Sustainable Cities and Communities (DS4SSCC) Deployment phase. Aim of the DS4SSCC pilot projects is to validate the blueprints for Data Spaces (Data Space 4 Smart Communities) in different cross boarder use cases. Each use case creates a new data service. The CitizenCity pilot project has three parallel use case defined.

Deliverable D2.1 outlines the Common Engagement Model developed within the CitizenCity pilot project, as part of the DS4SSCC Deployment Phase. This model addresses the challenge of fragmented and ad hoc stakeholder engagement in public-sector digital innovation by providing a structured, repeatable framework for involving stakeholders across all project stages. Rooted in the IAP2 Spectrum of Public Participation, the model promotes transparency, trust, and long-term impact through tailored engagement methods that evolve with the project context.

The document combines a literature review of engagement strategies with a detailed framework comprising five stages: Plan, Design, Implement, Monitor & Evaluate, and Iterate. It includes practical tools such as a stakeholder mapping template, engagement method matrix, and performance indicators for continuous improvement. The proposed model will be applied and validated across three use cases in Eindhoven, Oulu and Vitoria-Gasteiz. Each use case addresses unique urban challenges through data-driven innovations.

Internally, within the project consortium, the model serves as a shared foundation for planning and executing stakeholder engagement consistently and effectively across pilot sites. It supports coordination among partners, clarifies roles and expectations, and ensures iterative learning. Externally, the deliverable contributes to the DS4SSCC objective of scalable, interoperable data space solutions by offering a transferable engagement methodology for public entities, municipalities, and EU-level stakeholders, aiming to replicate or build upon CitizenCity's approach.

The intended audience of the CitizenCity Communication Management Plan consists of members of the CitizenCity consortium and the DS4SSCC-DEP mentor.



1. Aim of the document

1.1 Introduction

Stakeholder engagement is a critical, yet often fragile component of public-sector innovation projects. Over time, engagement processes may lose momentum due to several factors: stakeholders may feel their input is not genuinely considered, their needs are unmet, or their expectations diverge from those of project managers (Koalick & Wilde, 2014). Paradoxically, even satisfied stakeholders may disengage if they believe their continued involvement is no longer necessary. These challenges can be mitigated through adequate stakeholder selection, the setting of clear and shared goals, transparent communication, and the willingness to adapt the engagement strategy when needed (Koalick & Wilde, 2014). Moreover, well-designed feedback mechanisms help maintain trust by showing stakeholders how their input has shaped the project's outcomes and emphasizes value on their contributions to keep them engaged (Tractivity, 2025). Despite increasing awareness of these dynamics, public-sector data initiatives often rely on fragmented, ad hoc engagement strategies—what can be described as a “one-project, one-method” patchwork. Each team tends to develop its own surveys, workshops, or data-sharing rules in isolation, which leads to disconnected insights and inconsistent experiences across projects. As a result, stakeholder trust and engagement continuity may be compromised.

To address this challenge, the CitizenCity project proposes a Common Engagement Model: a structured and iterative framework designed to guide how public organizations interact with, involve, and deliver value to a wide range of stakeholder groups. This model is an abstraction of the cooperation canvas that is described in D2.2, by proposing stakeholder engagement practices across different phase. The model aims to harmonize engagement practices across contexts, boost transparency and satisfaction, and ensure that stakeholder insights can be effectively translated into long-term impact. The Common Engagement Model will be tested, validated, and refined through three diverse pilot use cases. Each illustrates a different application of the structured engagement cycle in fostering information exchange, collaboration, and co-creation. These use cases are described in detail below.

Eindhoven Use Case

The Eindhoven use case aims to develop a Positive Energy District (PED) by integrating energy-related data into the city's existing Stratum data platform. This platform feeds the municipal *Woningbouw* monitoring app, which tracks the construction of 40,000 new homes by 2040 and the transition from gas to renewable energy sources. The project aligns with Eindhoven's broader energy transition objectives and promotes sustainable, data-informed urban development.

The new data service will be embedded in the municipal organization to support multiple departments, businesses, knowledge institutes and citizens. This guarantees the future of the project results, building on experiences with the Woonconnect app of the EU Triangulum project. The energy data will be combined with livability and social resilience data in the Buurtkijker app. This project creates a data fundament for living in a Positive Energy District and not only supports local innovation but also offers a scalable model for other municipalities within the 21-city Metropolitan Region Eindhoven (MRE)



The use case will contribute to energy data standardization of energy flows in cities and neighbourhoods in relation with data services related to weather, as well as New European Bauhaus urban design and energy management of buildings. The project is deployed in the city of Eindhoven, the Netherlands, starting in the frontrunner neighbourhood the Irisbuurt. The stakeholder engagement model developed in this project offers scalability and transferability across diverse urban contexts. By centring on iterative engagement, real-world user insights, and co-creation, the methodology supports the projects pilot case cities in aligning stakeholder needs with practical, data-informed solutions.

The methodology's structured yet adaptable design enables seamless integration into other pilots beyond the original scope. Whether applied in mobility, energy, governance, or public services, this model facilitates the implementation of data space approaches that are inclusive, actionable, and tailored to the priorities of all involved stakeholders. Cities seeking to build interoperable and participatory digital ecosystems can adopt this model as a foundation for durable, context-sensitive innovation.

Oulu Use Case

The Oulu use case focuses on enhancing urban liveability and promoting sustainable behaviours through cross-sector data collaboration and AI-driven interfaces. This is achieved by creating a shared "Oulu data space" that integrates several types of data such as waste, water, energy, traffic and public transport data for real-time analysis. These data spaces have two primary end-users: 1) the city of Oulu, which utilizes the data space and accompanying **digital twin** to aid decision making; 2) citizens, who will be able to interact with the data through an **AI chatbot**, ultimately making the data and insights more accessible and offering (personalized) advice. Additionally, third-party companies and research institutions could also become end-users of these dataspace. This project is launched as a pilot in the newly built Hartaanselkä region, where the first residents will be moving in during the summer of 2025. Initially the data insights for citizens will be based on aggregated data and thus more generalized, the future goal is to have them personalized.

Vitoria-Gasteiz Use Case

The province of Alava faces significant challenges during winter due to adverse weather conditions such as snow and ice, which impact road safety and efficiency. These conditions currently complicate road management, especially because it warrants meticulous attention to multiple data sources. Vitoria-Gasteiz use case aims to optimize winter road safety and traffic management through data sharing to improve safety and efficiency. The use case targets the city of Vitoria-Gasteiz and small surrounding towns in the province of Alava. This case also has two end products for separate groups of end-users. Key outcomes include 1) A **dynamic heatmap** highlighting high-risk zones for city planners and road maintenance teams, which will be used to efficiently deploy road maintenance teams and aid management decisions of the regional council in these adverse conditions; 2) A **digital application** providing alerts and alternative routes to citizens and other road users (e.g. public bus drivers or logistic companies) and providing alternative route suggestions.

1.2 Structure of deliverable D 2.1

Deliverable D2.1 supports in achieving milestone 1 MS1 from the Use Case Implementation Plan described in D5.2 to ensure the project is technically and methodological ready to engage with stakeholders to work on the implementation of the Use Cases. This deliverable is structured as



European data space
for smart communities

follows. Section 2 presents a state-of-the-art review of stakeholder engagement methods, highlighting strengths, limitations, and relevance to urban data initiatives. A cross-mapping between stakeholder types, their roles in various project stages, and appropriate engagement methodologies is included to inform the model's application. Section 3 introduces and explains the Common Engagement Model framework in detail, outlining its structure, implementation phases, and adaptability across use cases. By adopting the proposed methods and frameworks at the correct stages, an effective stakeholder engagement strategy can be employed to succeed in T5.1.

2. Literature review of stakeholder engagement methods

This literature review focuses on proposing stakeholder engagement methods effective for different purposes and stages of the projects to successfully implement the use cases following T5.1. Effective stakeholder engagement is essential in public-sector data and innovation projects. A well-structured engagement strategy enables trust-building, collaborative design, and informed decision-making. We refer to the International Association for Public Participation's (IAP2) Spectrum of Public Participation to frame and categorize the various engagement strategies. This model identifies five escalating levels of engagement based on the degree of influence stakeholders have over the decision-making process: **Inform** → **Consult** → **Involve** → **Collaborate** → **Empower**. Each level represents a different objective for stakeholder engagement and aligns with specific methods. This section reviews the most commonly used methods across these categories, their appropriate use cases, and critical considerations for effective implementation.

2.1 Informing Methods (One-Way Communication)

Although *inform* is the lowest level of engagement in IAP2, it is still effective when used for the right purpose. The goal at this level is to provide the public / stakeholders with objective information to assist them in understanding the project and its decisions (US EPA, 2014). Stakeholders should be able to understand what is happening and why, but do not have an opportunity to voice their concerns, provide input, or receive decision-making power. It is important to note that informing should be factual and unbiased (US EPA, 2014). Informing is not a Public-Relations-exercise.

Informing is most appropriate when the project's or end product's design parameters are largely non-negotiable (for that specific stakeholder) or already decided, or in the stages where the goal is to raise awareness. One of the major advantages of informing methods are its (cost-) efficiency and broad reach. Early in the project it serves as a common knowledge base amongst stakeholders, which is essential for the higher levels of engagement discussed below. Finally, transparency through objective informative communication builds trust and credibility (US EPA, 2014). Stakeholders want to be kept "in the loop," even though they do not have any direct input at that moment.

However, too much reliance on inform strategies can lead to frustration with stakeholders. If stakeholders expect a higher level of engagement, e.g. because they have high stakes or interest in the project, informing alone is not appropriate. And if it is, but the execution is not fitted to the targeted audience (e.g. too simple/complex language), the stakeholder engagement method will not be very effective either. The common methods used for informing are presented below.

Newsletters and Fact Sheets



Newsletters are periodic publications, usually in digital form, which provide updates about the project. The primary purpose of these is to keep the stakeholders who are most interested informed (US FWS). By delivering regular updates, newsletters help maintain stakeholder interest overtime. They demonstrate a commitment to transparency and update the foundational knowledgebase required for further levels of engagement in later stages of the project. Newsletters go to those who are opted-in (or at least not opted-out, as per GDPR requirements (GDPR, 2022)). This is a blessing and a curse, as it means that the audience is already somewhat engaged and thus allows for more detailed content. Although it also means that a stakeholder that opted out early in the project (when information was not deemed relevant for the stakeholder) is not easily reached anymore. That being said, it is still important that the newsletter's contents are of good quality, well-designed and tailored to the recipient (e.g. a "wall-of-text" is unlikely to be read, or too frequent updates may lead to more opt-outs). Periodically producing a quality newsletter requires time and effort. Newsletters' contents range from status reports, answers to frequently asked questions, or fact sheets, all as long as they are objectively written.

Fact sheets are concise (usually 1 page), and easily digestible documents that distils key information about an issue, proposal or project (US FWS). They present facts in a clear and brief format, using plain language, lists and visuals where possible. It should be able to answer the basic who/what/why questions of a project. These fact sheets can be distributed by email or in print through mail or at events. The short format has the benefit of clarity and convenience at the cost of limited depth. Furthermore, one must be cautious of the fact that the information can become outdated as the project progresses, and that recipients of the factsheet should be updated. This could also be done by placing a QR code / link on the fact sheet that refers them to an online and up-to-date website.

Project Website

A project website is a main source of information for the public or other stakeholders. They are easily accessible 24/7 (by the digitally literate) and can host a broad range of one-way communication formats as well as consultative methods that involve two-way information communication (e.g. upcoming event-boards, links to surveys and contact forms). A crucial benefit of websites is that they are updatable and 'self-service', i.e. accessible to anyone looking for it (US FWS). A common caveat is that they are not regularly updated or ill-designed, which may have the adverse effects of frustration and distrust. Creating and updating a proper website does take considerable time, depending on the project scope and number of updates. Furthermore, having a project website does not automatically mean that it can and will easily be found by the target audience. Once again, only those actively looking will find it. It is specifically this group that makes it important for the website to exist.

Social Media and Conventional Media

(Social) media can be used if the goal is to inform the general public. Through conventional media announcements or press releases it is possible to inform a lot of citizens due to its wide range. A product launch is a good exemplary situation in which this method of informing could really shine, because its response rate can be measured through new users. Social media enables even more efficient and broad information sharing. It potentially has a very broad reach and low costs. It does however require active management and a constant output to achieve this potential and outcompete other posts in the algorithm (US FWS). Its potential to reach a younger audience is therefore often not met, beyond a few impressions by those already actively involved with the project. Additionally,



social media blurs the line between solely informing and interacting. The comment section of a post has the potential to solicit feedback or a dialogue. Because (social) media announcements aimed toward the general public, the messaging must be concise and easy to understand, in turn risking oversimplification and misinterpretation (US FWS). This opens the door to stories starting to live their own life. Losing such control could unexpectedly harm the project. Informing through media has its benefits but should always be guided through a comprehensive (social) media strategy to avoid mishaps.

2.2 Consultative Methods (Two-Way Communication)

The second level of engagement methods is consultative. Stakeholders are asked for input that will inform decisions, but do not make decisions or directly influence them. The promise to the stakeholders at this level is to consider their input and provide feedback on how that input has influenced the decision (US EPA, 2014). This latter point is crucial to prevent a feeling of tokenism. If stakeholders suspect that their inputs do not truly influence decisions they lose trust and will not be willing to invest time again. Other challenges with consultative methods are unrepresentative feedback when certain stakeholder groups dominate participation, how to deal with conflicting inputs, and ensuring participants understand enough context to give informed feedback. Despite these challenges, consultative methods are valuable for two reasons. First, they uncover unknown issues and needs, shed fresh light on (new) innovative ideas that otherwise might have been missed, or generally provide valuable feedback. Second, they achieve stakeholder buy-in (i.e. willingness to engage and actively support the project, to help it happen).

Surveys and Questionnaires

The technical difference between these two is that a questionnaire refers to the actual list of questions, whereas a survey refers to the complete process. A survey thus considers the process from drafting the questionnaire, selecting the sample of participants to collecting and analysing data and drawing conclusions (Martin & Hanington, 2012). Surveys are thus not necessarily conducted through questionnaires, as structured interviews can also be a form of surveying. Surveys may consist of 'open' questions for detailed feedback or 'closed' questions (e.g. multiple choice, rankings or scales) for results that are easily quantifiable. Surveys are praised for their reach and efficiency, especially in this digitalised day and age. The standardized approach leads to quantitative results that can easily be (statistically) analysed, allowing for objective results regarding stakeholder preferences or needs (Martin & Hanington, 2012). Further benefits of online surveys in particular include participant anonymity and flexibility, which invites honest feedback and higher response rates.

However, there are also some caveats of such a standardized approach. For one, survey results are only as good and in depth as the survey design allows. Nuance and depth are often lost because of surveys' predefined nature, and unknowns may not be uncovered. Open-ended questions help, but at the cost of efficient analysis. Moreover, poorly worded questions and overall design can lead to biased results. Furthermore, "Response bias" stems from busy or uninteresting stakeholders not responding and thus being underrepresented in the result. It should always be the aim to limit such biases, and where not possible, recognized. Neutral wording is crucial, and a mix of question types are useful methods to mitigate bias. Moreover, offering an incentive for participation – especially if citizens are the targeted participants – is useful to increase response rates. Finally, surveys are most



useful when combined with other methods, either before or after the survey, possibly in other project stages.

Kano model

The kano model is a survey method especially useful for choosing a promising solution direction by using stakeholder input to prioritize features based on end-user satisfaction. Rather than assuming customer satisfaction as one dimensional – higher quality feature = higher satisfaction – the Kano model introduced the idea that this is not automatically the case. On the contrary, customer satisfaction is one dimension, and feature quality or ‘functionality’ is the other (Sauerwein, Bailom, Matzler, & Hinterhuber, 1996). Satisfaction is often measured in 5 steps: frustrated → dissatisfied → neutral → satisfied → delighted. Similarly, functionality ranges from none to best in five steps as well. This allows product features to be classified in 5 categories, most of which are visualized in **Fout! Ongeldige bladwijzerverwijzing.**:

1. Performance: these are the one-dimensional features, where more functionality linearly leads to more satisfaction (e.g. speed of the tool)
2. Must-be: these features are expected. If they are not present, users will be dissatisfied. If they are, satisfaction will not reach higher than neutral (e.g. privacy).
3. Attractive: when these features are present in the product, they can only cause a positive reaction. These are unexpected features that are thus not missed (e.g. innovative features, unknown to the future users)
4. Indifferent: As the name reveals, users do not care if this feature is present and it is usually a waste of time to develop these.
5. Reverse: This last category is not visualized, but it is fairly straight forward: users would be increasingly dissatisfied if the feature is included. Naturally, reverse features should be avoided.

The kano survey method starts with selecting a list of features to include in the questionnaire. Keep this list to a reasonable length (5 – 15 features) as too many can overwhelm participants. Then, three questions are asked per feature. A functional/dysfunctional question pair and a question regarding self-stated importance. The pair (“How would you feel if feature X is present / absent?”) are answered on a 5 point scale (e.g., “I dislike it that way”, “I can live with it that way”, “I am neutral”, “It must be that way”, “I like it that way” (Sauerwein, Bailom, Matzler, & Hinterhuber, 1996). The question pair can be complemented by figures that illustrate the purpose of the feature. Asking both questions actually enables a mapping of the feature according to the kano model, and helps filtering out “questionable” responses. These are an unofficial sixth category of features, where people’s responses to both questions are contradictory. Asking for self-stated importance (e.g. on a 1-9 point scale) helps calculating the weighted averages over all respondents. The features can be classified using the table in **Fout! Ongeldige bladwijzerverwijzing.** and is easiest done using an automated spreadsheet. The result is an informed prioritized list of features that is directly defined by users or stakeholders.



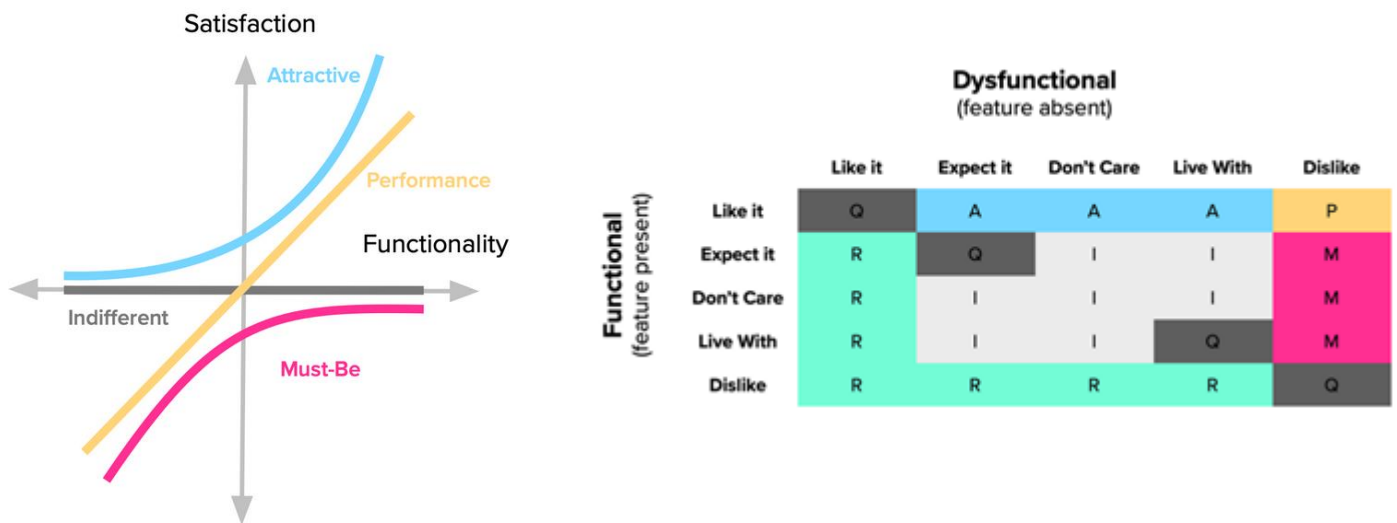


Figure 1: Kano model's categories of product features (left) and Evaluation of Kano method responses (right). P = performance, A = attractive, M = Must-be, I = indifferent, R = reverse and Q = questionable (Folding Burritos, 2015).

The advantages of this method are evident; it distinguishes non-negotiable features from extra's and has user satisfaction as central goal. The questionnaires are easily distributed online and due to its clear guidance for decision-making their contribution can be transparently communicated to the participants. Risks with the kano method lay in question formulation and making sure the stakeholder grasps the concept of the feature, and different segments of users may have different views on features (experts may see something as a 'must-be', whilst a layman views it as 'attractive'). Identifying respondents per stakeholder group or user segment helps understand seemingly split results.

Decision matrices

Decision matrices are not per definition a consultative method, although it's inputs could be gathered through consultative methods as well. Similar to the Kano model, decision matrices are also best used in the stage in which one design direction has to be chosen. It is a technique for systematically comparing multiple options against a set of criteria (Martin & Hanington, 2012). The basic concept is as follows: list the design options and criteria important for success (e.g. costs, user-friendliness, data accessibility, speed, privacy). Assign weights to these criteria based on importance and score each design concept per criterion, yielding a ranked comparison. This is often called a multi-criteria analysis. Pugh charts are similar in concept, but the rating is in direct relation to a baseline alternative, thus especially useful for an improvement use case.

Inputs for such decision matrices can come from consulting stakeholders. E.g. surveying for weights or asking them to fill in the matrix individually to gauge opinions. But also which criteria are important to stakeholders can be asked through interviews, when asking what the user needs and values are most important to the stakeholders. As mentioned earlier, decision matrices are not only useful when consulting stakeholders, but also at higher levels of engagement. Conducting a multi-criteria analysis or creating a Pugh chart are ideal activities during workshops or co-design sessions, and they could be used to let stakeholders have a vote in the decision making process. The matrices should not be the sole decision maker, as they may not capture certain intangible factors or risks and important



context and nuance may be lost (Martin & Hanington, 2012). When used in collaboration session, discussions during and after scoring can help to validate the results, reach consensus and acknowledge the shortcomings of the method and execution. Overall, utilizing decision matrices lead to structured and transparent decision making.

A/B testing

A/B tests are a data-driven consultation method and incorporate stakeholder feedback through tracking users' real-world behaviour and is commonly used in user experience and web design. It randomly presents users with the 'A' or the 'B' version (there could be more than two) of a product or feature and saves their behaviour in terms of various metrics such (e.g. Click Through Rate, Abandonment rate) (Content Square, 2024). Note that stakeholders are not explicitly expressing ideas or providing input, but they 'vote with their clicks' and are unaware of the experiment. It thus provides objective and empirical feedback yet does not resolve the 'why' behind user choice (Content Square, 2024).

Moreover, multiple versions of the product must have already been launched and available to the public / end-users to be able to use A/B testing. This makes it only viable in the last design stages when the most impactful decisions have already been made. Furthermore, it requires a reasonable number of users for statistically relevant results. The chosen metrics give helpful insights, but one must be wary of the fact that these metrics may also be limiting – they do not give the full picture (Content Square, 2024). Lastly, not all questions can be answered with A/B testing. It is useful to compare small differences between versions of the product, but fundamentally different versions are beyond the scope of this method. It is for above mentioned reasons that A/B testing is best used with complementary qualitative methods such as interviews or focus groups.

Interviews

Interviews are a fundamental consultative method to collect first hand experiences, stories and opinions. Structured interviews are consistent, thus good for data analysis. By asking every participant the same question categorizes structured interviews as surveys. These have the downside that they can feel unpersonal to the interviewee. Luckily, semi- or unstructured interviews are a flexible alternative. Unstructured interviews feel more like a friendly conversation, because the interviewer has none (or some at most in semi-structured format) questions prepared, only a few topics they want to cover. This builds trust and interviewees may be more inclined to share personal stories or pain points and can reveal unexpected insights (Martin & Hanington, 2012). A non-judgmental stance, conscious use of tone, and attention to question formulation are all critical to mitigate interviewer bias. The skilled interviewer is a neutral listener, tasked with noticing unexpected tangents and asking the right questions to understand the why's – a unique strong point of interviews within consultative methods.

"Laddering" is an interviewing approach used to find underlying stakeholder values by probing and continuously asking e.g. "Why is that important?" (Martin & Hanington, 2012). Besides, conducting interviews signals stakeholders that their individual voice matters. Stakeholders often appreciate the chance to be heard one-on-one, which builds goodwill and trust in the project. Interviews produce substantial volumes of qualitative evidence, which warrant extensive qualitative data analysis. The Gioia method is such a rigorous coding method and is briefly summarized below. As with other



consultative methods it is important to inform the stakeholders how their input will or has influence decision making.

Gioia method for qualitative interview data

As the authors that coined the method mention as the method's ground assumption is that people "are knowledgeable agents, namely, people in organizations know what they are trying to do and can explain their thoughts, intentions, and actions." (Gioia, Corley, & Hamilton, 2013). The consequence of this assumption is that it foregrounds the participant's interpretations and represents their voices prominently. The point of departure for rigorous Gioia data analysis are semi- or unstructured interviews (Gioia, Corley, & Hamilton, 2013). It is of vital importance that the interviewer uses the terms and constructs of the participant during and after the interview to stay as close to the participants lived experience as possible.

The Gioia method progresses into a structured coding process in two levels. The first order coding seeks to extract concepts in the participant's own words and ideas. Through iterative analysis these concepts are grouped and interpreted into second-order themes – more abstract categories defined by the analyst (Gioia, Corley, & Hamilton, 2013). The process is transparent and systematic, which gives stakeholders' input more credibility in decision-making. Because Gioia is an interview data analysis tool it can be used in every project stage. Even if not doing full Gioia, adopting its principles (raw quotes → codes → themes) can improve how one derives insights from consultation interviews and build legitimacy.

Focus groups

Focus groups are an efficient consultative method where a small group (5-10) of homogeneous stakeholders is brought together to discuss their feelings, opinions, and ideas on a given topic. The group dynamic is a distinguishing feature with unique advantage within the realm of consultative methods. First, participants spark ideas of each other or remind each other of experiences. Second, they debate on points of difference which can lead to deeper collective insights and stakeholders may even reach a degree of consensus. Third, observing (non-verbal) reactions to statements made by another stakeholders' yields extra insights (Martin & Hanington, 2012). A well run focus group is moderated to create a peer environment in which all stakeholders feel free to share, and in which the right questions are prompted to steer the conversation towards interesting topics. On the other hand, insights from focus groups may be skewed due to dominant members monopolizing the conversation and some members may conform to the majority opinion, if the moderator fails to create the ideal environment (Martin & Hanington, 2012). Finally, analysis of focus group data is far more complex than that of interviews, which requires time and attention to do properly.

Feedback forms

Feedback forms are a simple consultative tool and are usually offered to the user right after they experienced the product. The forms are typically short and focused on receiving an answer to one or two open-ended questions, e.g. "How was your experience?" or "Do you have any suggestions?". They allow stakeholders to voice concerns or ideas spontaneously. They are similar to surveys, although differ in the sense that feedback forms are commonly user-initiated (often mildly nudged). But because they rely on stakeholder initiative, most responses will come from those that are strongly motivated (either extremely positive or negative). One must be cautious to not let the opinion of the quiet majority be misrepresented by the louder minority. Nevertheless, feedback forms are an easy and low effort method to harvest additional feedback and inputs on a product, which is useful for further iterations.



2.3 Involve and Collaborate Methods (Two-Way Engagement)

In the IAP2 framework, Involve and Collaborate are both forms of two-way engagement, but they differ in the degree of influence stakeholders have over outcomes. Involve means stakeholders are actively engaged in shaping processes and decisions, but final decision-making authority remains with the project team. Collaborate implies a more equal partnership, where stakeholders and project actors work together to develop alternatives and choose preferred solutions. Despite these differences, the methods used to support both levels often overlap. The distinction lies more in how much power is shared and how their input is integrated. This section reviews methods suitable for both levels, while noting when the method may lean more toward collaboration than involvement.

In a Two-Way engagement approach, stakeholders can be involved in decision-making by deploying methods such as workshops, co-design sessions, roundtable discussions, and fast prototyping. A more in-depth elaboration of each method is provided further in this section.

Workshops

Workshops are a two-way engagement method that enables stakeholders to collaborate for defining, creating and deciding upon user requirements. It is a structured meeting with a carefully selected group of stakeholders and domain (content) experts who work together for defining, creating and deciding upon user requirements. This ensures that the end product of the project does not end up with technological problems. Organizing workshops is a three-stage process consisting of preparing the workshop, conducting the workshop, and a follow-up.

Workshops can be used to define the generate new ideas for the data structures, model the process, create better communication between parties, and create a common ground for the continuation of the work (Wiegers & Beatty, 2013). Important practical matters are that room logistics and equipment should be arranged in advance. In addition, the agenda and other materials should be sent in advance for the participants to prepare.

During the session, it is important to first present the purpose of the workshop, agenda, roles and rules. Next, the participants should be presented, and practical issues should be discussed. Select a method/technique that will be applied to conduct the workshop and present this to the participants. Remember to ensure that all participants opinions are respected and keep the discussion to the topic. Also, ensure discussions are fact-based on issues, and not about people. Summarize regularly to keep anyone on track and agree in advance how decisions are made.

Strengths of organizing workshops are that the elicited requirements from multiple users concurrently and it enables to resolve disagreements when everyone is present. However, workshops are time consuming, not all participants might be available at a certain time, and the success depends of the knowledge of the facilitator. Also, it is important to invite the right types and number of stakeholders. When the group is too large, workshops can slower the process, while too few stakeholders can lead to missing important feedback (Wiegers & Beatty, 2013).



Co-design sessions

Co-design is an approach to design attempting to actively involve all stakeholders in the design process to help ensure the result meets creative and user-centred outcomes (Norman, n.d.). Co-design sessions can either be in generative research or in evaluative sessions (Martin & Hanington, 2012). Here, the first focuses on co-design exercises, such as flexible modelling, contributing to ideation, and verifying team direction. These sessions often include hands-on techniques like mapping, collage-making, or diagramming. In evaluative sessions, participants are brought together to collectively review concepts, offer feedback, and contribute insights for design iteration and refinement. Figure 2 provides an outline of the structure and purpose for co-design session (Benz, et al., 2024).

The first workshop focuses on building relationships in an inclusive way. This session requires the co-designers to prioritise five experiences and feelings they aim to have in the future deliverable. In the second session, the co-facilitators explain the complete journey map to the co-designers. For the third workshop, the co-facilitators select activities to be completed, separately by the citizens and the co-designers. The citizens activity involves exploring preferences for improving pain points identified through the journey map. Similarly, in this workshop co-designers complete an activity to address pain points from a service delivery point of view. This identifies a list of opportunities for improvement. Workshop 4 introduces the concept of prototyping as a way to test the ideas for improving the developed deliverable according to desirability, feasibility and viability with a wider group of citizens. After workshop 4, the co-designers collaborate on the prototypes to present during session 5. Then, the co-design group reviews the draft prototypes in the final session, with specific attention paid to the story's cohesiveness. The feedback questionnaire the is completed by citizens outside of the co-design group after engaging with the prototype. A reflection activity concludes the final workshop, allowing co-designers to provide feedback on the co-design process, elements for improvement and aspects they valued in participating in the project.

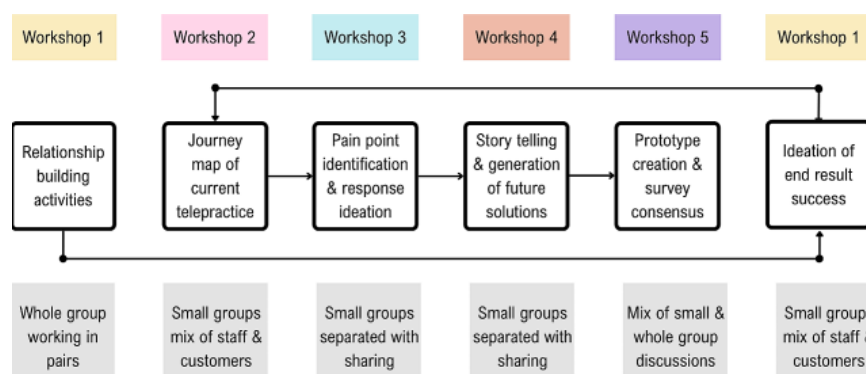


Figure 2: Visualization of co-design project structure (Benz et al., 2024)

Benefits of co-design is that it is a fun way to gain the creative trust and input of stakeholders through activity-based research. Co-design workshops engage participants, often non-designers, in intensive creative activity usually centred on assigned problems. Also, co-design has proven to improve quality and more satisfactory services (Benz, et al., 2024).



However, critical features of co-design sessions are to plan the timing and logistics appropriately. Also, it can be resource-intensive to organize and facilitate. To overcome these challenges, co-design sessions need a balance of design team facilitators relative to the number of participants, with clearly defined roles.

Roundtable discussions

A roundtable discussion is a structure yet informal meeting where participants engage in open dialogue about a predetermined topic. The discussion is an open where everybody is on equal footing - the intent is for everyone to have equal influence and to speak uncensored (Bridgeman, 2010). Roundtable discussions are similar to workshops, but typically more informal and so smaller. Particularly, roundtable discussions are useful for involving specialist interest groups and fostering mutual understanding among actors with differing perspectives (UK Government, 2025). The final aim is to reach a consensus between those groups. The preparation involves the recruitment of a number of stakeholders who literally will sit around a table and discuss the issues until a solution is reached. For this, a strong and skilful group management and facilitation is essential for this approach to be successful.

There are several factors to realize a successful roundtable discussion (Verana, 2025). For a successful roundtable discussion, a clear objective and direction must be set, which helps the participants understand the purpose of their participation. Also, when the participants know what is expected of them, they can contribute more meaningfully. In addition, having the right participants is key to the success of your discussion. Ideally, participants should be active listeners and credible in the specific topic of discussion. Moreover, ensure the logistics are good organized and ensure an appropriate date, time, and location for your target participants. It might be helpful to create a program for the roundtable discussion consisting of icebreaker activities, a short introduction of the participants, and alignment of the overall objectives of the gathering.

Since roundtable discussions gather participants who share the same field and it allows for deeper conversations, attendees have the chance to connect with each other. Also, roundtable discussion requires constant participation and therefore all individuals are contributors. Roundtable discussion is an adequate strategy for public engagement since it brings together voices from every stratum of citizens. However, the commitment requirement from participants is high and time-consuming.

Fast prototyping

Fast prototyping is an iterative design approach that involves quickly creating tangible representations of ideas or solutions (Mackay & Beaudouin-Lafon, 2023). These prototypes can range from simple sketches or paper models to more sophisticated digital or physical models. The primary goal is to visualize concepts early in the design process, allowing for immediate feedback and iterative improvements. This can help to facilitate communication by bridging gaps in understanding between the designers and stakeholders. Also, it encourages collaboration since it involves stakeholders directly in the creation and refinement of solutions (Rodriguez-Calero, Daly, Burleson, & Sienko, 2023).



When using fast prototyping as stakeholder engagement method, the objectives first need to be defined (Osman, Baharin, Ismail, & Jusoff, 2009). The objectives of the prototyping session need to be clearly articulated and identify the specific aspects of the solution to be explored. Depending on the context, appropriate tools for the fast prototyping session should be selected. For example, paper, cardboard, digital software, or 3D printing technologies. Next, a diverse group of stakeholders is invited to participate in the prototyping session. It is important to ensure a representative group from all relevant perspectives. Then the prototype creation starts by collaboratively building prototypes, encouraging stakeholders to contribute as many ideas as possible. After the session, the prototypes need to be tested with stakeholders, feedback is gathered and iterate on the design to refine solutions (Rodriguez-Calero, Daly, Burleson, & Sienko, 2023).

Benefits of fast prototyping are that stakeholders are more likely to feel invested in solutions they help create. Also, it improves communication by bridging communication gaps and it accelerates learning since quick iterations allow for rapid identification of issues and opportunities. The most important is that fast prototyping is cost-effective since it enables early detection of design flaws that can save resources in the long run (Rodriguez-Calero, Daly, Burleson, & Sienko, 2023). However, this method might be resource intensive regarding time, materials, and facilitation expertise. Also, without clear guidance, stakeholders might misinterpret prototypes, leading to confusion.

2.4 Empowering Methods (Shared Decision-Making)

Description: In the IAP2 framework, for empowering methods stakeholders are given authority or control over final decisions-making. In this case, stakeholders are also decision makers and decisions are implemented based on vote or consensus (Facility Engagement Initiative, 2025). This facilitates benefits of shared decision-making approach is increased trust, more robust decision-making. However, these methods require time and involve complexity due to balancing interests. Examples of empowering methods on further is elaborated are stakeholder steering committees, citizen juries, and community lead initiatives.

Stakeholder steering committees

A stakeholder steering committee is a formal group comprising representatives from key stakeholder groups, such as community members, industry experts, policymakers, and organizational leaders (Zola & McLaughlin, 2023). This group is tasked with providing strategic oversight, guidance, and decision-making support for a project or initiative. These committees serve as a bridge between the project team and the broader stakeholder community, ensuring that diverse perspectives are considered and that the project aligns with stakeholder needs and expectations.

When establishing a stakeholder committee, it is important to articulate the committee's purposes, responsibilities, and authority within the project (Hamilton, Callister, & Boone, 2025). The committee should include individuals from various stakeholder groups to capture a wide range of insights and expertise. Next, the governance structure is established by dividing roles, defining decision-making process, meeting schedules, and communication protocols. Meetings should be conducted at key project milestones to review progress, address challenges, and make strategic decisions. Ensure



open communications with the broader stakeholder community and that decisions and actions taken by the committee are documented.

Benefits of stakeholder committees are that a broad representation of stakeholders leads to more comprehensive and inclusive decision-making. Also, it identifies potential issues through stakeholder insights that can mitigate risks. Moreover, the stakeholders can aid in securing resources and support for the project (Hamilton, Callister, & Boone, 2025). However, establishing and maintaining an effective committee requires significant time and resources. Also, achieving consensus among diverse members can slow down the decision-making process (Lechler & Cohen, 2009).

Citizen juries

A citizen jury is a deliberative democratic process that engages a representative sample of citizens to deliberate on (complex) public issues. Typically, a citizen jury comprises 12 to 24 participants and the jurors are selected through random or stratified sampling to reflect the broader community's demographics. Over several days, jurors receive balanced information from expert witnesses, engage in facilitated discussions, and develop informed recommendations or decisions on the issue at hand. The aim is to promote decision-making based on process of careful consideration, debate, and respect for different viewpoints (O'Haire, McPheeters, & Nakamoto, 2025).

First the purpose, scope, and key questions asked by the jury are defined. The jurors that are selected via random or stratified sampling should represent the community's diversity. Ensure inclusivity by considering factors like age, gender, ethnicity, and socioeconomic status. During the information gathering it is important to provide jurors with balanced, comprehensive information through expert presentations, written materials, and Q&A sessions. Facilitated discussions allow jurors to explore the issue, consider different perspectives, and deliberate on potential solutions. Jurors formulate recommendations or decisions, often aiming for consensus but sometimes using voting mechanisms. The jury's conclusions are compiled into a report, which is presented to decision-makers and made available to the public (O'Haire, McPheeters, & Nakamoto, 2025).

Benefits of citizen juries are that it ensures informed decision-making, as jurors deliberate on comprehensive and balanced information provided by experts (EPA United States Environmental Protection Agency, 2025). This process enhances the legitimacy of decisions, as outcomes reflect the considered views of a representative citizen group, which can in turn increase public trust. Citizen juries also foster active public engagement, encouraging citizens to participate meaningfully in governance and policymaking. However, they also present challenges (EPA United States Environmental Protection Agency, 2025). Citizen juries are resource-intensive, requiring substantial time, funding, and logistical planning. They typically focus on a single issue, which may limit their ability to address broader systemic concerns. Furthermore, their outcomes are often non-binding, meaning recommendations may not be implemented, potentially leading to frustration or disillusionment among participants.

Community led initiatives



European data space
for smart communities

Community-led initiatives are projects or programs initiated, planned, and executed by community members themselves. These initiatives leverage local knowledge, skills, and resources to address specific challenges or opportunities within the community (Van Der Bilt University, 2025). The approach emphasizes empowerment, inclusivity, and shared decision-making, ensuring that solutions are culturally appropriate and contextually relevant.

Community-led initiatives begin with community engagement, where facilitators hold open dialogues to understand local needs, aspirations, and assets. Capacity building follows, providing training and resources to help community members plan, implement, and manage projects. Through collaborative planning, stakeholders and residents co-create action plans, set goals, and define roles and responsibilities. Resource mobilization ensures necessary funding, materials, and expertise are secured. During implementation, ongoing monitoring allows for adjustments to improve outcomes. Finally, evaluation and reflection help the community assess results and refine strategies for long-term sustainability. This participatory approach empowers communities to create solutions that are locally relevant and resilient.

Benefits of community-led initiatives are that they foster empowerment by placing decision-making in the hands of local people, enhancing community confidence and self-reliance (Silverton, Botha, & Niethammer, 2025). Because initiatives are rooted in local knowledge, they ensure relevance to the specific cultural, social, and economic contexts of the community. This locally driven approach also promotes sustainability, as community members have a vested interest in maintaining long-term success. Additionally, such initiatives strengthen social cohesion by building trust and relationships through collaborative action (Van Der Bilt University, 2025). However, they can face resource limitations, with communities sometimes lacking sufficient funding, expertise, or infrastructure (Silverton, Botha, & Niethammer, 2025). Capacity challenges may arise due to varied skill levels, affecting project efficiency. Lastly, power dynamic, especially without ongoing external support, can hinder equitable participation and project continuity.

2.5 A Cross-mapping

Previous sections have presented an extensive, though not exhaustive overview of stakeholder engagement methods, categorized per IAP2 level of engagement. This addresses the first half of central questions for stakeholder engagement design – “How to, and to what extent, involve stakeholders?” – and informs the Data Cooperation Canvas. These methods still have to be matched to the ‘who, why and when’ of stakeholder engagement to arrive at an effective overall engagement model. To address the latter point, an adapted version of the engineering design cycle is proposed (see Figure 3) This simplified version focuses only on distinguishing the relevant stages for allocating engagement methods. As is well established, the design cycle is iterative. The completion of stage 4 marks the point at which a first version of the product has been tested. In the subsequent iteration, new user problems or needs may be identified, which necessitates restarting the new iteration from stage 1. Alternatively, in the case of only minor adjustments are required, which warrants returning to stage 3. The other internal arrows highlight the process’ iterative nature, even within one cycle.



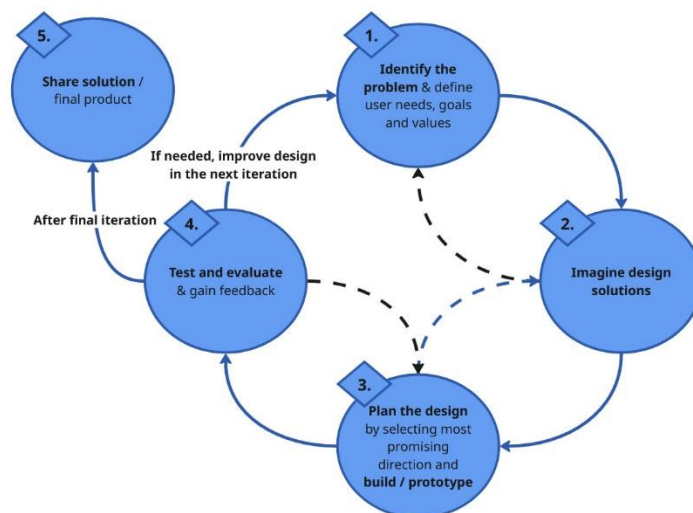


Figure 3: Adapted design cycle for selecting a fitting engagement method, based on the engineering design cycle from (Vale, Barbosa, Peixoto, & Fernandes, 2022)

To finalize the engagement design strategy, the answers to the ‘who’ and ‘why’ should also be included. The table below cross-maps stakeholder types, project stages and appropriate engagement methods. This table provides a general overview that helps to involve the right stakeholders at the right time and choose an engagement method that match the phase, stakeholder role and engagement goal. It is also the point of reference to fill in the proposed template that is added to the appendix.

Table 1: Cross mapping of the ‘who’, ‘when’, ‘why’ and ‘how’ of stakeholder engagement

Stakeholder Type	Project Stage	Engagement Goal (IAP2 Level)	Intended outcome	Suggested Methods
Core (full time on the project)	S1: Identify	Involve → Collaborate	Jointly define the problem, identify user needs, goals and values	Workshops, roundtable discussions, stakeholder steering committees
	S2: Imagine	Collaborate	Co-develop possible solution directions and assess feasibility	Co-design sessions, roundtable discussions
Core (full time on the project)	S3: Plan & Build	Collaborate → Empower	Select preferred design direction, develop and prototype jointly	Co-design sessions, fast prototyping, stakeholder steering committees
	S4: Test and evaluate	Collaborate → Empower	Evaluate design performance, uncover necessary changes for next iteration	Fast prototyping, stakeholder steering committees, roundtable discussions



Stakeholder Type	Project Stage	Engagement Goal (IAP2 Level)	Intended outcome	Suggested Methods
Involved (provides regular input, collaborate regularly)	S1: Identify	Consult → Involve	Validate and enrich problem definition from specific expertise and set requirements	Interviews, surveys, focus groups
	S2: Imagine	Consult → Involve	Contribute to ideation and preference shaping, adjust requirements	Workshops, focus groups, interviews
	S3: Plan & Build	Consult → Collaborate	React to design plans, raise concerns and usability feedback	Co-design sessions, fast prototyping, focus groups, interviews
	S4: Test and evaluate	Consult → Involve	Share experience, assess effectiveness, help prioritize improvements	A/B testing, surveys, focus groups, interviews
Informed (wants to stay up to date and give feedback/input when necessary)	S1: Identify	Inform → Consult	Understand project goals and raise potential concerns	Newsletters, websites, surveys, interviews
	S2: Imagine	Inform → Consult	View solution concepts, give general preferences or feedback	Websites, social media, surveys, interviews
	S3: Plan & Build	Inform → Consult	Stay informed about design choices and give input to prioritize design features	Newsletters, websites, surveys
	S4: Test and evaluate	Inform → Consult	Give feedback or signal satisfaction	Surveys, A/B testing, feedback forms, websites, (social) media, fact sheets

3. Framework of the common engagement model

To move beyond fragmented and ad hoc engagement practices, we propose a Common Engagement Model—a structured, repeatable framework that guides public-sector actors through all stages of stakeholder engagement. This model is designed to be flexible enough to adapt to different contexts while providing a consistent structure for planning, delivering, and learning from engagement activities. Rooted in the IAP2 Spectrum, the model ensures that the level of engagement matches stakeholder expectations and project needs, while enabling data-informed refinement across iterations.

The framework is organized into five sequential stages: Plan/Stakeholder mapping, Design, Implement, Monitor & Evaluate, and Iterate. Each stage is guided by a core question, produces



specific outputs, and sets up the next phase with clearer goals, improved data, or refined methods. This cyclical design ensures that engagement is not a one-off activity, but an evolving process where each round build on the last. Figure 4 demonstrates the framework of the model.

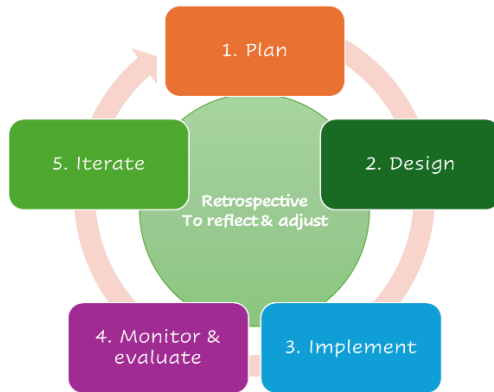


Figure 4: The framework of the Common Engagement Model

Detailed explanation of each stage’s purpose, typical outputs, and its role in preparing for the next step, creating a continuous learning loop for more effective and inclusive stakeholder engagement will be presented in sub-sections 3.1-3.5.

This retrospective cycle builds upon the retrospective cycle described in D5.2, with both being part of the iterative co-creation process outlined in the Common Engagement Model and the Use Case Canvas methodology, respectively. Specifically, this framework takes the validated insights and requirements from the cycle of the Use Case Canvas Methodology to further refine the value creation, digital twin development, and collaboration processes. Together, the models enable a structured, iterative improvement of both the technological solution and stakeholder cooperation mechanisms.

3.1 Plan (Stakeholders mapping)

The plan stage lays the foundation for all subsequent stakeholder engagement activities. Its central aim is to define why engagement is needed, who should be involved, and how. Without clearly articulated objectives and a well-understood stakeholder landscape, engagement efforts risk becoming misaligned, under-resourced, or ineffective. Therefore, this stage focuses on setting objectives for engagement and creating or updating a comprehensive stakeholder map. A key decision at this stage is the appropriate level of engagement for each stakeholder group, as guided by the IAP2 Spectrum—ranging from Inform to Empower. Determining the right level of influence depends not only on a stakeholder’s interest or authority, but also on their relevance to the project phase, potential impact, and willingness to participate.



Stakeholder mapping is one important step in the Plan stage, which is used to identify, classify, and understand the relevant stakeholders to a project. This includes both internal and external stakeholders who may be impacted by or have influence over project outcomes. A well-crafted stakeholder map enables targeted engagement strategies that reflect each stakeholder's position, power, and role. The table 2 below provides a stakeholder mapping and commitment template, which helps assess stakeholders' relationship to the project, level of impact and influence, expertise and authority, current commitment levels, and required commitment levels. Figure 6 demonstrates the stakeholders on the map which distinguish them into core team, involved team, and informed team. The stakeholder mapping tool used in this project is Originally developed by VMware Tanzu Labs (VMware, 2025). Based on their relationship and engagement levels, the aim of engage different types of stakeholders could be identified. The clear objectives of engaging different stakeholders would help to link the right kind of engagement methods to actually deliver value (e.g., a survey is fine for consult, but co-design workshops work better for Collaborate/Empower).

Table 2: Header of the stakeholder mapping table, to be filled in per use case

Stakeholders			Project Relationship				Level of Commitment C = Current Level R = Required Level			
Name	Short explanation	Notes (if any)	Level of Impact (High, Medium, Low)	Level of Influence (High, Medium, Low)	Content Expert (Y/N)	Decision Authority (Y/N)	No Commitment	Let It Happen	Help It Happen	Make It Happen

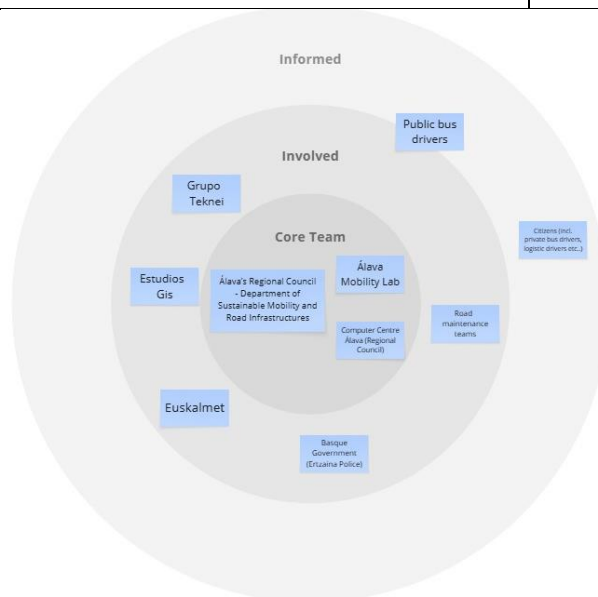


Figure 5: Example of stakeholders mapping across three levels of involvement

Note:

Core stakeholders have strong influence and co-responsibility in shaping decisions (e.g., municipalities, platform developers, lead community groups).



European data space
for smart communities

Involved stakeholders offer input, validate assumptions, or provide use-case insight (e.g., energy coaches, technical partners, resident representatives).

Informed stakeholders receive communication to stay updated and understand impacts, but don't influence decisions directly (e.g., broader public, passive residents).

3.2 Design

The Design stage translates strategic engagement goals into a concrete and actionable engagement plan. Once the “why” and “who” are established in the planning phase, the focus shifts to how to engage stakeholders in a way that is meaningful, proportionate, and tailored to their roles and levels of influence. The goal of this stage is to select appropriate engagement methods—such as surveys, workshops, co-design sessions, or citizen panels—that align with the desired level of stakeholder involvement (e.g., Inform, Consult, Collaborate). This ensures that engagement efforts are fit-for-purpose and that each activity contributes to the broader project objectives.

The procedure of this stage involves selecting methods from a method matrix, assigning responsibilities using a RACI-style sheet (who leads, who supports, who needs to be consulted/informed), and organizing logistical and ethical parameters such as facilitation, accessibility, and data handling. This stage results in a turnkey engagement plan that the implementation team can execute without ambiguity. To support method selection, a cross-mapping table is developed (Table 3), linking previously reviewed engagement methods with corresponding objectives and stakeholder roles, categorized as Core (actively shaping decisions), Involved (providing input), or Informed (receiving updates only). This mapping provides clarity on which methods are appropriate for which stakeholders and why, improving alignment and accountability across the engagement process.

Table 3: List of engagement methods and their goals per level of engagement

Engagement Method	IAP2 Level	Typical Objectives	Appropriate Stakeholder Role
Newsletters / Fact Sheets	Inform	Share project updates, raise early awareness, ensure transparency	Informed
Websites / (Social) Media	Inform	Provide public access to project information, timelines, and FAQs	Informed
Surveys / Questionnaires	Consult	Collect feedback on preferences, measure satisfaction, rank priorities	Involved / Informed
A/B Testing / Polls	Consult	Test alternative formats or policies, gather behavioural insight	Involved
Interviews	Consult	Gather deep qualitative insights from selected stakeholders	Involved / Core (if strategic voices)
Focus Groups	Consult	Explore diverse viewpoints, validate assumptions, co-interpret insights	Involved
Workshops	Involve	Co-define needs or requirements, identify shared concerns, refine scenarios	Involved / Core
Co-Design Sessions	Collaborate	Jointly create solutions, explore technical/financial trade-offs, co-prioritize ideas	Core
Roundtable Discussions	Collaborate	Align positions among key actors, explore consensus or negotiate conflicts	Core



Engagement Method	IAP2 Level	Typical Objectives	Appropriate Stakeholder Role
Fast Prototyping	Collaborate	Rapidly test and iterate design ideas with feedback from key stakeholders	Core / Involved
Stakeholder Committees	Empower	Give stakeholders structured, ongoing decision-making power	Core
Citizen Juries	Empower	Let randomly selected citizens deliberate and shape final recommendations	Core (public voice)
Community-Led Initiatives	Empower	Enable grassroots actors to drive and own specific project components	Core

Note:

Core stakeholders have strong influence and co-responsibility in shaping decisions (e.g., municipalities, platform developers, lead community groups).

Involved stakeholders offer input, validate assumptions, or provide use-case insight (e.g., energy coaches, technical partners, resident representatives).

Informed stakeholders receive communication to stay updated and understand impacts, but don't influence decisions directly (e.g., broader public, passive residents).

3.3 Implementation

The Implementation stage puts the engagement plan into action. At this point, the methods and timelines have been defined, stakeholders identified, and roles assigned. The primary focus now is to execute activities smoothly, inclusively, and with fidelity to the design stage. This means ensuring that logistics are well coordinated, that facilitators are adequately briefed, and that participants are meaningfully included—especially those from underrepresented or vulnerable groups. A successful implementation ensures that engagement activities are not only delivered, but experienced in a way that builds trust, encourages openness, and avoids participation fatigue.

To achieve this, implementation relies on practical tools and quality assurance mechanisms. These typically include a logistics checklist (covering venue, materials, tech, translations, etc.), a detailed event run sheet (with timing, roles, and contingencies), and specific accessibility provisions to accommodate different needs (e.g., language, mobility, or digital access). On-the-ground experiences also serve as the first layer of monitoring data, such as attendance records, feedback forms, Q&A logs, and field notes about what worked or didn't. These outputs not only demonstrate that the engagement occurred as planned, but also provide critical input for the subsequent Monitor & Evaluate phase.

3.4 Monitor & Evaluate

The Monitor & Evaluate stage assesses whether stakeholder engagement efforts met their intended objectives and how they were experienced by participants. This stage is critical for learning, accountability, and continuous improvement. Rather than evaluating success only in terms of outputs (e.g., how many people attended), it also examines process quality, equity of participation, and impact on decision-making. It helps determine whether the engagement methods used were appropriate, whether the right stakeholders were reached, and whether they felt heard and valued.



European data space
for smart communities

The evaluation process involves collecting both quantitative and qualitative indicators to assess whether stakeholder engagement activities against their intended objectives. It aims not only to document what was done, but also to uncover how well the engagement worked, for whom, and why. Evaluation provides accountability, supports adaptive learning, and helps ensure engagement efforts remain inclusive, relevant, and trustworthy. Crucially, it captures both the measurable outcomes and the lived experiences of participants, giving teams the insights needed to strengthen future engagement cycles. To achieve this, both quantitative and qualitative indicators will be gathered as shown in table 4.

Table 4: Monitoring and Evaluating indicators of stakeholder engagement efforts

Category	Indicator	Type	Data Source	Frequency	Interpretation / Notes
Reach / Inclusion	# of participants per activity	Quantitative	Event data, Sign-in sheets, registration logs	Per event	Gauge participation volume
	Demographic distribution (age, gender, role, etc.)	Quantitative	Event data, Sign-in sheets, registration log	Per event	Assess diversity and representativeness
Engagement Quality	“Was your voice heard?” rating (1–5)	Quantitative	Open-ended survey, interviews	Per milestone/phase	Quick check on perceived influence
	Stakeholder satisfaction of the engagement quality score (1–10)	Quantitative	Open-ended survey, interviews	Per milestone/phase	Overall satisfaction with engagement experience
	Participant quotes / comments	Qualitative	Open-ended survey, interviews	Per milestone/phase	Surface insights, emotions, and suggestions
Effectiveness	# of stakeholder inputs adopted	Quantitative	Workshop notes, decision tracking	Per milestone/phase	Tracks influence on decisions during the process
Process Reliability	Timing vs. schedule adherence	Quantitative	Event logs, facilitator reports	Per event	Measure logistical effectiveness
	Issues encountered / lessons learned	Qualitative	Debrief notes, facilitator reflections	Per event	Improve implementation and adapt in real time

3.5 Iterate

The Iterate stage ensures that stakeholder engagement becomes a learning loop, not a one-off activity. It builds on the insights gathered from monitoring and evaluation to refine future engagement strategies, adjust stakeholder mappings, and reset expectations. Iteration is especially important in long-term or multi-phase projects like CitizenCity, where stakeholder dynamics, data needs, and project goals may evolve over time. This stage enables teams to stay responsive to feedback, emerging risks, or newly identified stakeholder groups.



Key outputs include updated stakeholder profiles—such as changes in interest, influence, or trust—and adjustments to engagement objectives or IAP2 levels. For instance, a group initially targeted with “Consult” methods may warrant more active “Collaborate” engagement in the next phase, or a newly active actor may emerge as a core stakeholder. Iteration closes the loop by feeding these adjustments back into the Plan stage, allowing the next engagement cycle to begin with refined priorities, fresher data, and smarter strategies.



References

- Benz, C., Scott-Jeffs, W., McKercher, K., Welsh, M., Norman, R., Hendrie, D., . . . Robinson, S. (2024). Community-based participatory-research through co-design: supporting collaboration from all sides of disability . *Research Involvement and Engagement*, 10-47.
- Bridgeman, P. A. (2010). Round Table Discussion: An Effective Public Engagement Strategy. *NACSW Convention* .
- Content Square. (9. October 2024). *A Comprehensive Guide to A/B Testing*. Abgerufen am 2025 von <https://contentsquare.com/guides/ab-testing/>
- EPA United States Environmental Protection Agency. (9. June 2025). *Public Participation Guide: Citizen Juries*. Von epa.gov: <https://www.epa.gov/international-cooperation/public-participation-guide-citizen-juries> abgerufen
- Facility Engagement Initiative. (9. June 2025). *IAP2 Engagement Framework: Resource Guide (ID 301532)*. Von facilityengagement.ca: <https://facilityengagement.ca/sites/default/files/IAP2%20Engagement%20Framework%20%28ID%20301532%29.pdf> abgerufen
- Folding Burritos. (5. June 2015). *The Complete Guide to the Kano Model*. Von <https://foldingburritos.com/blog/kano-model/> abgerufen
- GDPR. (2. November 2022). *Direct marketing rules and exceptions under the GDPR*. Von <https://www.gdprregister.eu/gdpr/direct-marketing-rules-and-exceptions/> abgerufen
- Gioia, D., Corley, K., & Hamilton, A. (2013). Seeking Qualitative Rigor in Inductive Research: Notes on the Gioia Methodology. *Organizational Research Methods*, 16(1), 15-31. Von <https://doi.org/10.1177/1094428112452151> abgerufen
- Hamilton, M., Callister, D., & Boone, K. (9. June 2025). *Starting a Steering Committee: A Change Agent's Guide to Success*. Von uidaho.edu: <https://www.uidaho.edu/-/media/uidaho-responsive/files/extension/publications/bul/bul1039.pdf> abgerufen
- Koalick, M., & Wilde, L. (2014). *Stakeholder Engagement in Human Right Due Diligence* . Worms: Global Compact Network Germany.
- Lechler, T. G., & Cohen, M. (1. March 2009). *Exploring the Role of Steering Committees in Realizing Value from Project Management*. Von journals.sagepub.com: <https://journals.sagepub.com/doi/10.1002/pmj.20094> abgerufen
- Mackay, W. E., & Beaudouin-Lafon, M. (2023). Participatory Design and Prototyping . *Handbook of Human Computer Interaction*, 1-33.
- Martin, B., & Hanington, B. (2012). *Universal Methods of Design* . Beverly : Rockport Publishers.
- Norman, D. (kein Datum). *Codesign*. Von Interaction Design Foundation: <https://www.interaction-design.org/literature/topics/codesign#:~:text=Codesign%20is%20a%20collaborative%20approach,innovate%20and%20solve%20problems%20effectively.> abgerufen
- O'Haire, C., McPheeters, M., & Nakamote, E. (9. June 2025). *Appendix F Descriptions of Stakeholder Engagement Methods*. Von ncbi.nlm.nih.gov: <https://www.ncbi.nlm.nih.gov/books/NBK62556/> abgerufen
- Osman, A., Baharin, H., Ismail, M., & Jusoff, K. (2009). Paper Prototyping as a Rapid Participatory Design Technique . *Computer and Information Science*, 53-57.
- Rodriguez-Calero, I., Daly, S., Burleson, G., & Sienko, K. H. (2023). Prototyping strategies to engage stakeholders during early stages of design: a study across three design domains . *Journal of Mechanical Design*, 145-172.
- Sauerwein, E., Bailom, F., Matzler, K., & Hinterhuber, H. (1996). The Kano Model: How to Delight Your Customers. *International Working Seminar on Production Economics*, 1, S. 313-327.
- Silverton, S., Botha, D., & Niethammer, J. (9. June 2025). *Toolkit for local governments and community led-initiatives* . Von sustainablejustcities.eu:



- <https://sustainablejustcities.eu/sites/default/files/media/Toolkit%20for%20local%20governments%20and%20community%20led-initiatives.pdf> abgerufen
- Tractivity. (9. June 2025). *The Levels of Stakeholder Engagement*. Von Tractivity : <https://www.tractivity.co.uk/blog/levels-of-stakeholder-engagement#involving> abgerufen
- UK Government. (2025). A. Stakeholder engagement strategies.
- US EPA. (10. March 2014). *Public Participation Guide: Selecting the Right Level of Public Participation*. Von <https://www.epa.gov/international-cooperation/public-participation-guide-selecting-right-level-public-participation> abgerufen
- US FWS. (kein Datum). *Stakeholder engagement Techniques*. Abgerufen am 2025 von <https://www.fws.gov/stakeholder-engagement/techniques>
- Vale, I., Barbosa, A., Peixoto, A., & Fernandes, F. (2022). Solving Problems Using the Engineering Design Process Through a STEAM Perspective., (S. 6565–6571). Von <https://doi.org/10.21125/edulearn.2022.1548> abgerufen
- Van Der Bilt University. (28. April 2025). *The Future of Community-Led Change: Why Does Grassroots Leadership Matter?* Von blog.peabody.vanderbilt.edu: <https://blog.peabody.vanderbilt.edu/the-peabody-blog/the-future-of-community-led-change-why-does-grassroots-leadership-matter> abgerufen
- Verana, C. (9. June 2025). *Unlocking the Power of Roundtable Discussion: Tips, Benefits, and Best Practices*. Von Event Espresso: <https://eventespresso.com/blog/guide-to-roundtable-discussion> abgerufen
- VMware. (2025). *VMware Tanzu Labs: A better way to build software*. Von <https://www.vmware.com/solutions/app-platform/tanzu-labs> abgerufen
- Wieggers, K., & Beatty, J. (2013). *Software Requirements*. Washington: Microsoft Press .
- Wikipedia. (9. June 2025). *Participatory design*. Von en.wikipedia.org: https://en.wikipedia.org/wiki/Participatory_design abgerufen
- Zola, A., & McLaughlin, E. (11. September 2023). *Steering Committee*. Von [techtarget.com](https://www.techtarget.com/searchcio/definition/steering-committee): <https://www.techtarget.com/searchcio/definition/steering-committee> abgerufen



Appendix A. Stakeholder mapping table

Stakeholder Mapping											
Stakeholders			Project Relationship				Level of Commitment C = Current Level R = Required Level				
Name	Short explanation	Notes (if any)	Level of Impact (High, Medium, Low)	Level of Influence (High, Medium, Low)	Content Expert (Y/N)	Decision Authority (Y/N)	No Commitment	Let It Happen	Help It Happen	Make It Happen	Strategies for Moving Commitment

Version#.Date : _____



Appendix B. Stakeholder engagement strategy Template

stages	S1: Identify the problem & define user needs, goals and values	S2: Imagine Solution directions	S3: Plan the design by selecting most promising solution direction and building / prototyping	S4: Test and evaluate (iterate engineering design cycle again)
Start date phase				
Core Stakeholders				
Involved stakeholders				
Informed stakeholders				

miro

The following information is added to the appropriate cell when planning an engagement activity in a certain stage for a certain stakeholder group. Note that the numbering merely refers to a suggested order of completion.

4. Method: e.g. co-design sessions

1. IAP2 level: e.g. collaborate

2. Goal: e.g. Co-develop possible solution directions and assess their feasibility within the discussed project scope

2b. intended outcomes and data: case specific

3. Invited stakeholders: e.g. stakeholder A, stakeholder B, stakeholder C (takes lead), stakeholder F



European data space
for smart communities