

## D3.3 Report on the meso level process (Inclusive Design Wheel)

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## Executive summary

This deliverable describes the application of the University of Cambridge (UCAM)'s Inclusive Design Wheel (IDW) process in five pilots across the four DIGNITY pilot cities/regions: Ancona (IT), Barcelona (ES), Flanders (BE) and Tilburg (NL). The five pilots used the IDW process to develop concepts, prototypes and recommendations for more inclusive mobility services in their regions.

The Ancona pilot aimed to improve the accessibility of their current public transport app and website, as well as to develop some non-digital solutions to include users who face digital exclusion. The Barcelona pilot examined an existing demand-responsive transport (DRT) service. They considered how to promote its use among groups with low digital competence, and how to improve the service and the reservation process. The Flanders pilot worked on developing Hoppincentrale, a central point of contact for end users for public transport questions and planning trips via an app, website or call centre. There were two pilots in the region of Tilburg. One focused on older people, and aimed to develop an intervention to help digitally excluded people (particularly those who are older) to get from A to B. The second Tilburg pilot focused on bike sharing. They aimed to develop a concept for a socially and digitally inclusive bike-sharing scheme, with special attention to the needs of migrant women.

The exact activities conducted, what they looked like in practice and the level of detail in the concepts varied between the pilots, depending on factors such as the scale and type of the problem being addressed and whether the team was adapting an existing solution or building a new one. This deliverable describes the key activities and outputs from each of the pilots in turn.

This report describes and reflects on activities up to May 2022. Due to the iterative ongoing nature of the IDW process, the pilot case work will continue beyond this date. The IDW process includes four phases: *Manage*, *Explore*, *Create* and *Evaluate*. All pilots did substantial work on *Manage*, *Explore* and *Create* and all except one did *Evaluate* activities as well, thus completing at least one iteration of the IDW process. However, as with any iterative process, the teams will continue work to further improve their outputs. In particular, the results of the *Evaluate* activities will be used to improve the understanding of the user needs and the concepts, prototypes and recommendations.

The outputs from the pilots offer the potential to reduce exclusion for their local mobility systems. These include usability and accessibility improvements of existing services, as well as concepts for new ways of accessing services and travel information which are more inclusive than the current provision. Other concepts developed by the pilots could improve inclusivity for vulnerable-to-exclusion groups, such as people with low income, older people and migrant women.

The experience of running the pilots has provided very useful feedback on the IDW. UCAM are currently considering improvements to both the IDW process and the mechanism for logging work done so far, taking into consideration the lessons learnt. The improved version will be available in the final version of the Dignity toolkit.



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# 1. Introduction

## 1.1 Dignity project summary

The overarching goal of DIGNITY is to foster a sustainable, integrated and user-friendly digital travel eco-system that improves accessibility and social inclusion, along with the travel experience and daily life of all citizens. The project delves into the digital transport eco-system to grasp the full range of factors that might lead to disparities in the uptake of digitalised mobility solutions by different user groups in Europe. Analysing the digital transition from both a user and provider's perspective, DIGNITY looks at the challenges brought about by digitalisation, to then design, test and validate the DIGNITY approach, a novel concept that seeks to become the 'ABCs for a digital inclusive travel system'. The approach combines proven inclusive design methodologies with the principles of foresight analysis to examine how a structured involvement of all actors - local institutions, market players, interest groups and end users - can help to bridge the digital gap by co-creating more inclusive mobility solutions and by formulating user-centred policy frameworks.

The idea is to support public and private mobility providers in conceiving mainstream digital products or services that are accessible to and usable by as many people as possible, regardless of their income, location, social or health situation or age; and to help policy makers formulate long-term strategies that promote innovation in transport while responding to global social, demographic and economic changes, including the challenges of poverty and migration.

By focusing on and involving end-users throughout the process of designing policies, products, or services, it is possible to reduce social exclusion while boosting new business models and social innovation. The aim of DIGNITY is to provide an innovative decision support tool that can help local and regional decision-makers formulate digitally inclusive policies and strategies, and digital providers design more inclusive products and services.

## 1.2 Objectives of this deliverable

The DIGNITY project is broken down into six Work Packages, which are described in Figure 1. Work Package 1 focusses on understanding the digital gap, Work Package 2 uses that knowledge to build the DIGNITY approach, and Work Package 3 applies that approach in pilot demonstrations.

This deliverable is part of Work Package 3. It describes the application of the DIGNITY Inclusive Design Wheel (IDW) process in pilot demonstrations. The IDW process itself was developed as part of Work Package 2 as a methodology for bridging the digital gap. It was based on the University of Cambridge (UCAM)'s Inclusive design process (Cambridge Engineering Design Centre, n.d. a), which was adapted for use within the DIGNITY project for the design of digital mobility products and services.



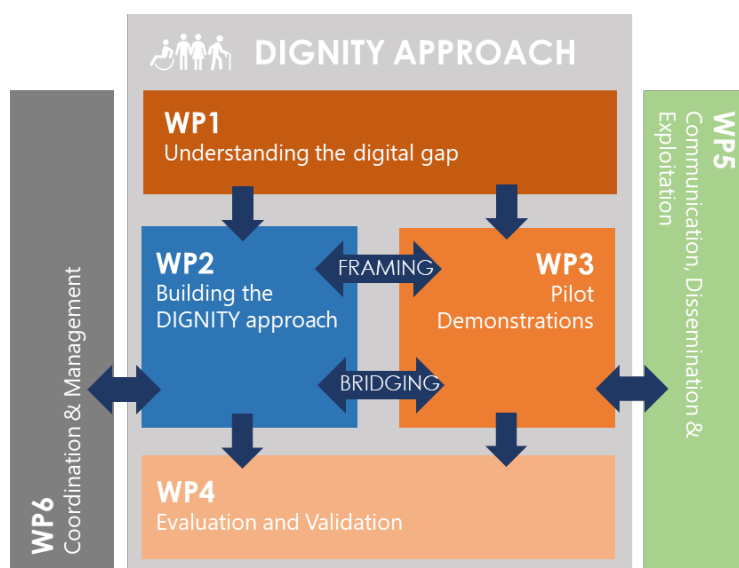


Figure 1: Work package structure for the DIGNITY project

This deliverable describes the application of the IDW process in five pilots across the four DIGNITY pilot cities/regions: Ancona (IT), Barcelona (ES), Flanders (BE) and Tilburg (NL). These pilots represent the first occasions that the IDW process has been 'outsourced' to external partners for their implementation, rather than facilitated directly by the UCAM Inclusive Design team. In addition, these are the first implementations in the context of digital mobility services, and as part of the wider DIGNITY project approach.

As such, the objectives of the pilot work include testing the DIGNITY IDW process in practice and informing its future improvement and development.

### 1.2.1 Relationship between this and other relevant Dignity deliverables

The IDW approach used in the pilots is detailed in DIGNITY deliverable D2.2: Guidelines for inclusive design processes for digital products and services (Bradley and Goodman-Deane, 2021).

The approach utilises the information gained from many of the previous DIGNITY activities. These activities provide background context, rich user insights and potential future scenarios. To understand how they input into the IDW process, it is important to understand that this process is composed of iterative cycles of *Manage*, *Explore*, *Create* and *Evaluate* phases (described in more detail in Section 2.3).

In detail, the pilots utilised information from the following DIGNITY activities in particular phases:

- The DIGNITY surveys of digital exclusion (DIGNITY deliverable D1.2 – Goodman-Deane and Waller, 2022). These surveys were conducted in each of the pilot countries/regions to provide an overview of the mobility situation and digital capabilities of the end users. The survey data was used particularly in building an understanding user needs in the

Explore phase of the IDW process and assessing the exclusion associated with concepts in the *Evaluate* phase.

- Framing the digital gap in mobility on a local level (DIGNITY deliverable D3.1 - Bracke et al, 2021). This was conducted for each of the pilot regions and provides valuable information on the end-users in the region, the current offering of digital mobility services, key stakeholders, governance and regulatory frameworks and budgets. This was particularly valuable for understanding the users in the *Explore* phase and understanding and engaging the stakeholders in the *Manage* and *Explore* phases
- Customer Journey Mapping (DIGNITY task 3.1.2, reported in deliverable D3.1 - Bracke et al, 2021). This provided insights into the user needs and valuable information on customer journeys which was used in the *Explore* phase.
- Scenario Building (DIGNITY deliverable D3.4 - Kollosche and Uhl, 2022). The scenario building process was conducted for each of the four pilot areas to produce potential future transport scenarios in the region. The process of building the scenarios can help to define the problem areas and initial ideas at the macro level and can help the pilot teams to understand the wider context in which the solutions developed in the IDW will function. The scenarios can also suggest ideas and possibilities as part of the *Create* phase.

The work done in the IDW pilots is being evaluated in Task 4.2 and will be reported in D4.2: Pilot cases evaluation report.

### 1.3 Outline of this deliverable

This deliverable consists of six sections including this Introduction. Section 2 provides some background on the IDW method and Section 3 gives an overview of how the IDW was implemented in the pilots as a whole. Section 4 examines each pilot in turn, providing detailed information on the pilot work, its timeline and selected activities in each of the phases. Individual reflections on each pilot are also included in this section. Section 5 reflects on the pilots as a whole and identifies some initial insights and lessons learnt for improving the IDW. Further evaluation of the pilots will be part of the DIGNITY Task 4.2 and reported in D4.2. Section 6 concludes.

Throughout this document, UCAM refers to the DIGNITY research partners at the University of Cambridge.

## 2. The Inclusive Design Wheel method

### 2.1 Background

The Inclusive Design Wheel (IDW) was originally developed by the Engineering Design Centre at the University of Cambridge to help designers to structure the inclusive concept design process (Clarkson et al., 2007; Waller et al., 2015; Cambridge Engineering Design Centre, n.d. a). More information about the general version of the Inclusive Design Wheel is available at <http://www.inclusivedesigntoolkit.com/>.



The DIGNITY IDW was developed from this general version within the DIGNITY Project. It has been adapted to be more specific to the needs and context of digital mobility products and services, and to interface with other parts of the DIGNITY approach such as the self-assessment framework, customer journey mapping and scenario building.

## 2.2 *Rationale for designing inclusively*

The goal of designing inclusively is to produce 'mainstream products and/or services that are accessible to, and usable by, as many people as reasonably possible, on a global basis, in a wide variety of situations and to the greatest extent possible without the need for special adaptation or specialised design' (British Standards Institution, 2005). Inclusive design offers a response to the increasing challenge of accounting for diversity and meeting the needs of groups who are often under-represented in design teams, such as women, migrants, people of low income and education as well as older people and people with capability impairments (Clarkson and Coleman, 2015).

Designing inclusively enables organisations to develop products and services which exclude fewer people and delight more people. Furthermore, doing so can benefit the wider society. For example, the first cordless kettles were developed for people with arthritis who found plugging and unplugging a cord difficult. Now we all use them because they are easier and quicker to use (Clarkson et al, 2007).

It is recognised that people can feel excluded from a product or service for many different reasons. These include culture ('that's not for me - it's meant for others'), language (including jargon – 'that's not for me – I don't understand it'), capability ('that's not for me – I can't read/use it'), ageism ('that's not for me, that's for young people) and attitudes ('I don't do that'). Some particular causes of exclusion in the domain of digital mobility products and services include lack of technology access, low digital interface capability, low prior experience with technology and negative attitudes towards new technology.

## 2.3 *Overview of the Inclusive Design Wheel process*

This section gives a brief overview of the IDW process to help readers to understand what the pilots did. The process is described in detail in DIGNITY deliverable D2.2 (Bradley and Goodman-Deane, 2021).

A key principle behind the wheel is that a design process is iterative. Furthermore, although there are individual activities in each phase, the sequencing of these is dependent on the decisions taken by the team in the central *Manage* phase.

### 2.3.1 The top-level inclusive design wheel

At the top level, the IDW consists of four main phases as shown in Figure 2:



1. **Manage:** Review the evidence to decide 'What should we do next?'
2. **Explore:** Determine 'What are the needs?'
3. **Create:** Generate ideas to address 'How can the needs be met?'
4. **Evaluate:** Judge and test the design concepts to determine 'How well are the needs met?'

Figure 3 shows that successive cycles of the *Explore*, *Create* and *Evaluate* phases are used to generate a clearer understanding of the needs, better solutions to meet these needs and stronger evidence that the needs are met. The *Manage* phase guides the process, keeping it on track.

The inclusive design process is necessarily iterative – as all design processes are. Mediated by the management decisions identified in the *Manage* phase, the design team would carry out activities in all the phases multiple times before the end of each project.

It is particularly important that the *Evaluate* phase is explicit and recognised as an integral and essential part of the iteration, to ensure that the resultant service or product achieves the goals agreed by the team and provides a solution for the identified users. Therefore, it is important to include an *Evaluate* phase in early iterations, in order to test ideas and concepts early and often. To achieve this, it is recommended that design team evaluate rough prototypes, mock ups or storyboards, early enough in the process that meaningful change is still possible.

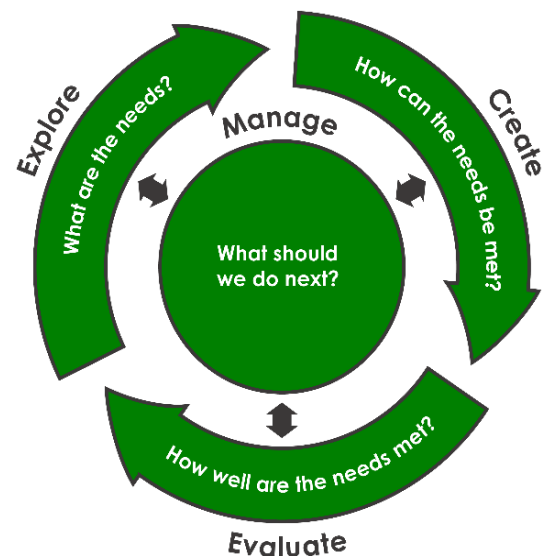


Figure 2: Overview of the inclusive design wheel

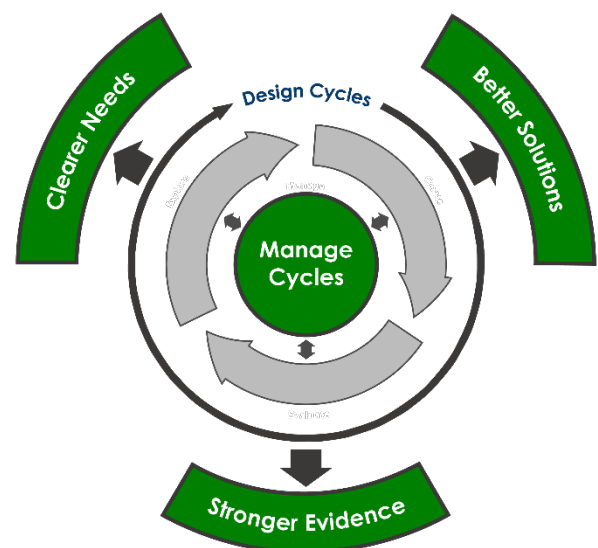


Figure 3: The iterative nature of the inclusive design wheel

### 2.3.2 Activities within the Inclusive Design Wheel

Each of the phases in the IDW includes several activities, as shown in the diagram in Figure 4 overleaf. Each of these activities is described in detail in D2.2 (Bradley and Goodman-Deane, 2021). Some of the activities are essential and others may be more relevant for some pilots than for others, or for different stages within a pilot. It was not expected that all pilot teams would do all the activities.

The process starts within the *Manage* phase with the initial team identifying the nature of the pilot's goals and starting to build the larger team that will carry out the work. They also start to engage the stakeholders whose support and input are required for the project to be successful.

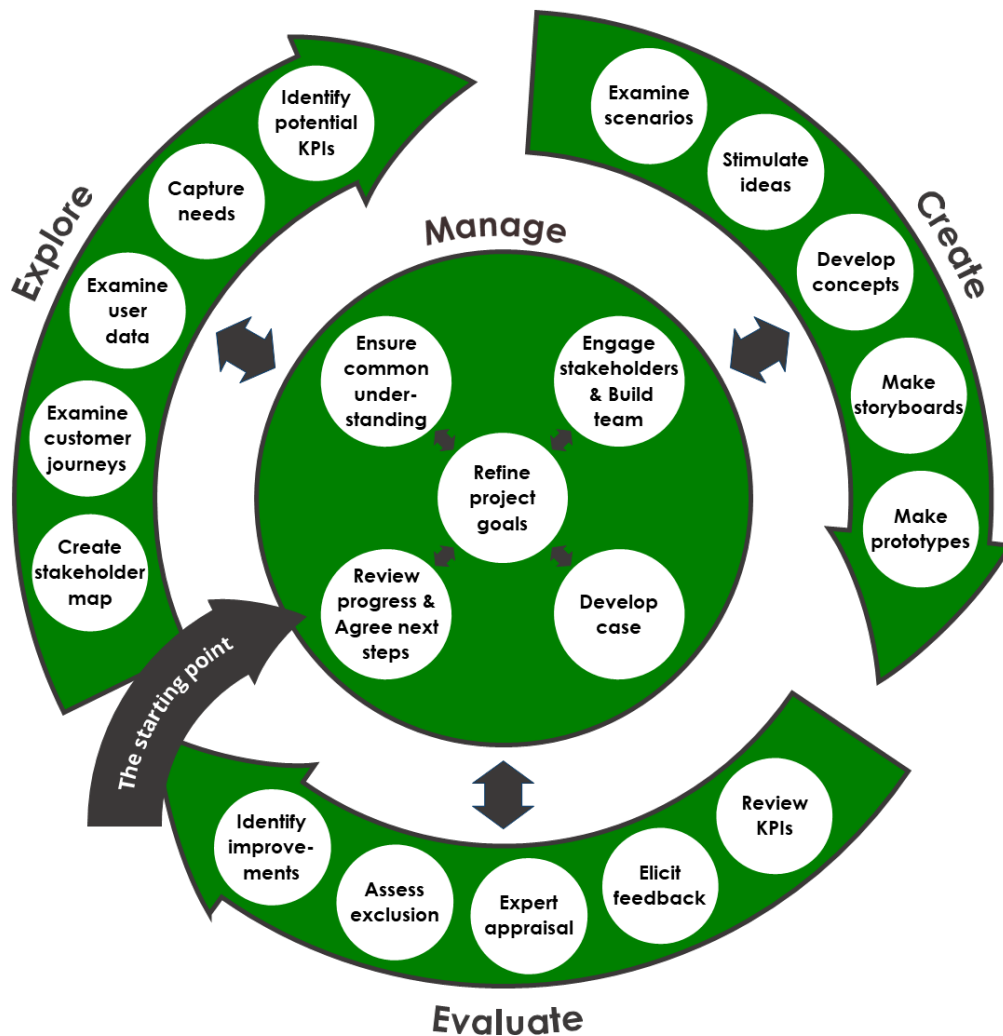


Figure 4: Dignity Inclusive Design Wheel with detailed activities in each phase adapted from (Clarkson et al., 2007; Waller et al., 2015)

## 3. General implementation

### 3.1 Overview

In the DIGNITY project, the pilot teams used the IDW process and activities described in Section 2 to develop concepts, prototypes and recommendations for more inclusive mobility services in their regions.





The Ancona pilot aimed to improve the accessibility of their current public transport app and website, as well as to develop some non-digital solutions to include users who face digital exclusion. The Barcelona pilot examined an existing demand-responsive transport (DRT) service. They considered how to promote its use among groups with low digital competence, and how to improve the service and the reservation process. The Flanders pilot worked on developing Hoppincentrale, a central point of contact for end users for public transport questions and planning trips via an app, website or call centre. There were two pilots in the region of Tilburg. One focused on older people, and aimed to develop an intervention to help digitally excluded people (particularly those who are older) to get from A to B. The second Tilburg pilot focused on bike sharing. They aimed to develop a concept for a socially and digitally inclusive bike-sharing scheme, with special attention to the needs of migrant women.

The exact activities conducted, what they looked like in practice and the order in which they were conducted varied between pilots, depending on various factors. These factors included: the scale and type of the problem being addressed, the target population, how much prior thinking had already been done on the topic, whether the team was adapting an existing solution or building a new one, and the scale and type of initial ideas for solution(s).

The initial plan for the pilot work is described in Section 4 of D2.2 (Bradley and Goodman-Deane, 2021). This was intended as an overall framework for the process, allowing for variation in the individual activities. It was expected that this plan would be adapted for each of the pilots, to best meet their needs, based on their constraints and the nature of their individual projects.

A detailed description of the work done by each pilot up to May 2022 is described in the following section (Section 4). Due to the iterative ongoing nature of the IDW process, the IDW work in the pilots will continue beyond this date as they further develop, test and refine their propositions.

### 3.2 *Initial meetings*

The UCAM team conducted an online training workshop for all the pilots together in Feb 2021. This introduced the teams to the basics of inclusive design and to the IDW approach. Apart from this kick-off workshop, the IDW work was carried out by the individual pilots, with support from and meetings with UCAM researchers. This allowed UCAM's support to be adapted to the specific needs of each pilot.

After the February workshop, the pilot teams conducted the scenario building process with IZT before focusing on the IDW work.

In the summer and autumn of 2021, the UCAM team met with each pilot team individually to start them off on the more focused IDW work. In these meetings, UCAM gave a more detailed briefing on the IDW and introduced the teams to the DIGNITY IDW design log for recording their IDW activities (see Section 3.3 for more information on this log).



### 3.3 IDW design log

The pilot teams were asked to record their IDW activities and progress in the DIGNITY IDW design log. This is a PowerPoint file with information on the IDW process and slides for each of the IDW activities. A customised navigation bar (shown in Figure 5) enables easy navigation to the section for each of the activities.

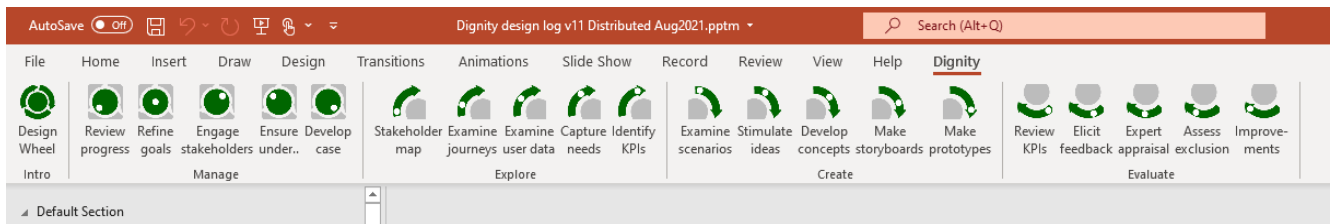


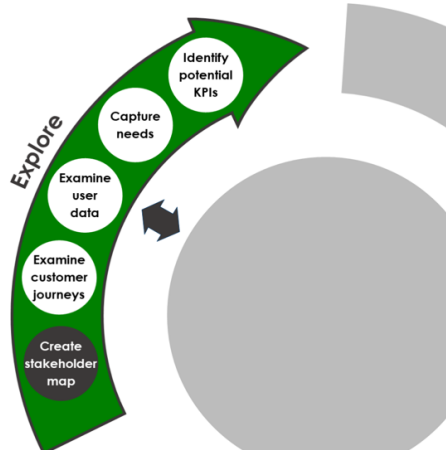
Figure 5: Closeup of the customised navigation bar in the design log

The slides for each activity include brief guidance on that activity (see example in Figure 6) and record sheets which can be filled in with notes and findings about that activity. Some of these sheets had a template with spaces for different kinds of information (see example in Figure 7). For some of the activities, multiple templates were provided, or teams had the option of presenting the information from that activity in a different way, if they preferred.

## Explore: Create stakeholder map

See Deliverable D2.2 for more information (slide 5 contains the link)

- A stakeholder is a key player who has something to gain or lose from the project. Stakeholders have an impact across the development, use and support of a product or service throughout its lifecycle, although they will vary with time.
- A stakeholder map helps to identify all the potential stakeholders and enables an assessment of their influence and interest in the project.
- The following slide shows an example stakeholder map from a healthcare project demonstrating the breadth of the stakeholders identified. This is followed by a number of templates which pilots can choose from. Alternatively, you can enter a photograph of your stakeholder map, or simply provide a list of stakeholders.



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Figure 6: Example of the introductory slide for an activity in the IDW design log



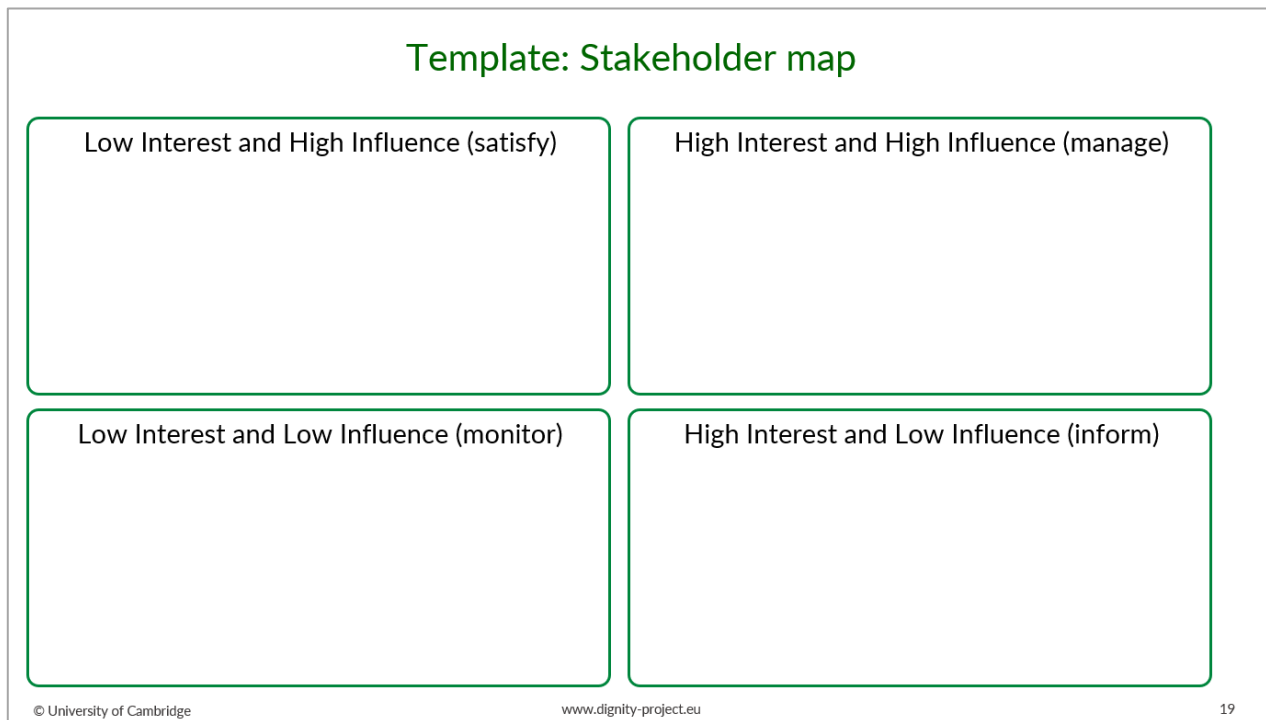


Figure 7: Example of a template slide for an activity in the IDW design log

### 3.4 *Manage phase*

The *Manage* phase guides the process, keeping it on track. As such, it took place throughout the other phases rather than being done separately.

The pilot teams each managed their own IDW pilot work, with input and prompting from the UCAM team as required. The *Manage* part of the design log could be used to:

- keep track of activities so far, review progress and plan next steps
- record the goals of the pilot and refine these if needed
- plan stakeholder engagement
- consider any words or terms that are likely to cause difficulty (e.g., because they are interpreted differently by different stakeholders) and record the agreed-on meanings for them
- develop and record the case for the pilot work and for implementation of the solution.

### 3.5 *Explore phase*

After the initial meeting, pilot teams filled in the *Explore* section of the design log. They produced a list or map of the stakeholders impacted by the pilot work and recorded key pieces of information from previous activities, such as the customer journey mapping and

surveys. They then drew on this information to develop a needs list. A needs list describes key needs of different stakeholders with regard to the mobility product or service being developed. The needs list could be used to help produce an initial list of potential KPIs for the pilot.

UCAM reviewed the design log so far and provided feedback by e-mail or in an online meeting.

### 3.6 Create phase

A key part of the *Create* phase is a co-creation workshop with end-users. Teams were briefed on how to set up and run these workshops by the UCAM team, but the workshops themselves were run by the pilot teams in the local language. Some of the co-creation workshops were delayed by local COVID-19 restrictions and/or other local constraints. As a result, some of the workshops were held as late as February 2022.

The co-creation workshops were primarily part of the *Stimulate ideas* activity in the *Create* phase, but all of them also had some elements of *Explore* (examining and understanding user needs). The details of the workshops were very specific to the goals of each pilot and are described for each pilot separately in Section 4.

After the co-creation workshops, the pilot teams developed concepts based on the ideas generated in the workshops. The concepts combined multiple ideas into more complete solutions that can satisfy the variety of needs identified in the *Explore* phase.

### 3.7 The Evaluate phase

The pilot teams delivered a description of their concepts to UCAM between Feb and Apr 2022. UCAM then provided feedback to the teams on their concepts. This included formative feedback, which discussed potential issues and ways to improve the concepts. Population exclusion figures were also provided for services and tasks that are commonly involved in digital mobility services (and in the pilot concepts). However, the second Tilburg pilot (see Section 4.5) delivered their concepts to UCAM too late for feedback to be included in this deliverable.

Some of the pilot teams also carried out their own user testing or expert appraisal on concepts or prototypes.

## 4. The individual pilots

The following sections describe the process and results of the IDW process in each of the pilots in turn. The Tilburg region had two separate pilots, which are described separately below.

## 4.1 Ancona

### 4.1.1 Introduction

Ancona is a city in the Marche Region of Italy. The DIGNITY partners for the Ancona pilot were myCicero, the municipality of Ancona (Department for Social Policies) and Conerobus. MyCicero partners with transport providers in Italy to provide integrated transport information and ticketing across multiple transport modes. Conerobus operates the local public transport service in the city of Ancona and its province.

The individuals involved in the pilot were:

- Paulo Cantillano, Daniela Vasari: myCicero
- Alessandra Baldini, Alessio Maria D'Angelo: Comune di Ancona
- Alessandro Di Paolo: Conerobus

The ATMA applications (app and website) are used in the province of Ancona to provide integrated transport information and mobile tickets. The pilot had previously identified that these applications had some accessibility issues and lacked potentially useful accessibility functionalities.

The Ancona pilot initially identified two goals:

- To improve the accessibility of the ATMA app to reach as many users as possible, including (mainly) the following vulnerable-to-exclusion groups: blind users and those with motor disabilities
- To add non-digital solutions to include users who face digital exclusion

In the process of conducting the IDW work, the pilot team identified the importance of improving the ATMA website as well as the app. As a result, the goals were refined as follows:

- To improve the accessibility of the ATMA app and website to reach as many users as possible, including (mainly) the following vulnerable-to-exclusion groups: blind users and those with motor disabilities
- To add non-digital solutions to include users who face digital exclusion

### 4.1.2 Overview of Ancona's IDW process

Table 1 on the next page shows a high-level timeline of the Ancona IDW activities after the initial training workshop in Feb 2021. These are categorised into the *Manage*, *Explore*, *Create* and *Evaluate* IDW phases. When the table mentions information being added or sections being filled in, it refers to the Ancona IDW design log.

The main work on the IDW started with a meeting with UCAM on the 13<sup>th</sup> July 2021. Prior to this, the Ancona pilot team had completed the DIGNITY scenario building and customer journey mapping work and had carried out some exploratory work through telephone interviews with users. The DIGNITY survey in Italy was also completed before this date.

Table 1: Timeline of activities conducted in the Ancona IDW pilot work

	Key activities			
Month	Manage	Explore	Create	Evaluate
<b>Before July 2021</b>		Phone interviews with users. Other DIGNITY activities, e.g., customer journey mapping.	Other DIGNITY activities: Scenario building	
<b>Jul 2021</b>	Initial meeting with UCAM. <i>Manage</i> sections of design log filled in	Filled in stakeholder list, customer journey and needs list	Added information on scenario building outcomes	
<b>Aug 2021</b>	Updates to <i>Manage</i>	Clarifications and updates		
<b>Sep 2021</b>		Co-creation workshop (included both <i>Explore</i> and <i>Create</i> elements)		
<b>Oct 2021</b>			Work on concepts (incl. prototype app)	
<b>Nov 2021</b>				
<b>Dec 2021</b>			Added website improvement to concepts	
<b>Jan 2022</b>			Continuing work on concepts	
<b>Feb 2022</b>				Developed user testing plan for app. First draft of accessibility audit of the ATMA website
<b>Mar 2022</b>				Formative feedback from UCAM
<b>Apr 2022</b>			Revisions to concepts based on UCAM feedback	UCAM sent feedback on the revisions. Final version of accessibility audit.
<b>May 2022</b>				Final feedback from UCAM. Pilot to conduct user testing

After the July meeting, the pilot team added information to the *Manage* and *Explore* sections of the IDW log and entered the results of the scenario building work into the *Create* section. The team started to plan their co-creation workshop in August, as well as adding further information to the *Manage* and *Explore* sections.



The co-creation workshop was held in September. It included some aspects of *Explore* (seeking to understand user needs) as well as *Create* (producing ideas for improving the transport situation). Outputs from this were added to the *Explore* and *Create* sections and the pilot team defined four concepts integrating several of the ideas.

In the following few months, the pilot team developed the concepts (including a prototype of a new version of the ATMA app interface) and decided to bring improvements to the ATMA website interface into the pilot scope.

From Feb 2022, the primary activities were evaluative in nature. In March, the team delivered to UCAM the new ATMA app prototype and a document detailing seven (mostly non-digital) recommendations for the transport system in the region, as well as a description of their own accessibility audit on the website and a description of their user testing plan. These are described in Section 4.1.6. After receiving formative feedback from UCAM, the team revised some of the concepts and their user testing plan. In May, UCAM provided final feedback, including population exclusion figures for various services and tasks that are commonly involved in digital mobility services. The team planned further user testing starting in May 2022.

Providing full details of all the activities is outside of the scope of this report, but some key aspects of each phase are described in the following sections.

### 4.1.3 Manage phase: Highlights

The Ancona team engaged with the *Manage* Phase from the start of their IDW journey and updated the *Manage* sections of the design log as they refined their thinking. They used roundels to indicate updates, as shown in the example in Figure 8.

The *Manage* phase is an ongoing phase that guides and directs the other phases. As such, the outputs from this phase are less directly visible and are mostly seen in the way the other phases were organised.



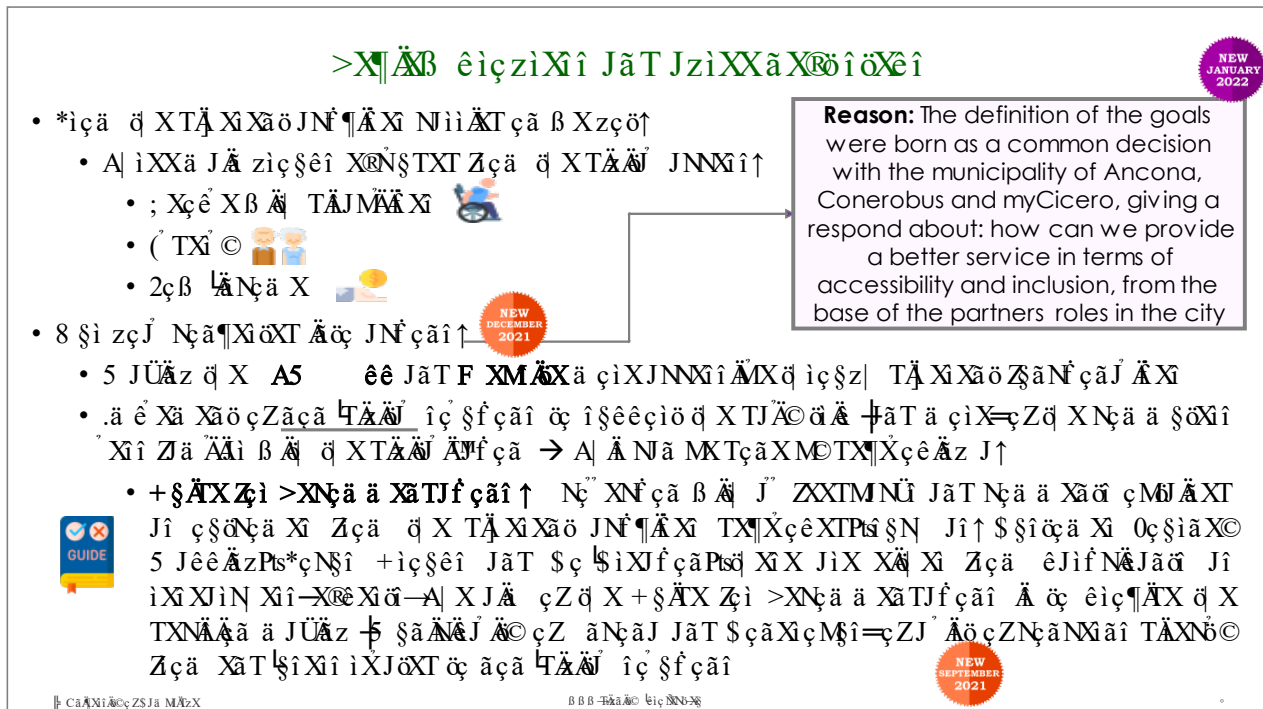


Figure 8: One of the Ancona pilot's slides from the Manage section of the design log. Roundels in orange and purple are used to indicate updates to the slide.

#### 4.1.4 Explore phase: Highlights

The Ancona pilot completed all of the activities in *Explore*. Figure 9 presents the pilot's stakeholder map, including various different types of users, government departments of user associations. Links between the stakeholders are also shown.

Customer journey information was added to the *Examine journeys* section of the design log from the customer journey mapping conducted earlier in the DIGNITY project (Bracke et al, 2021).

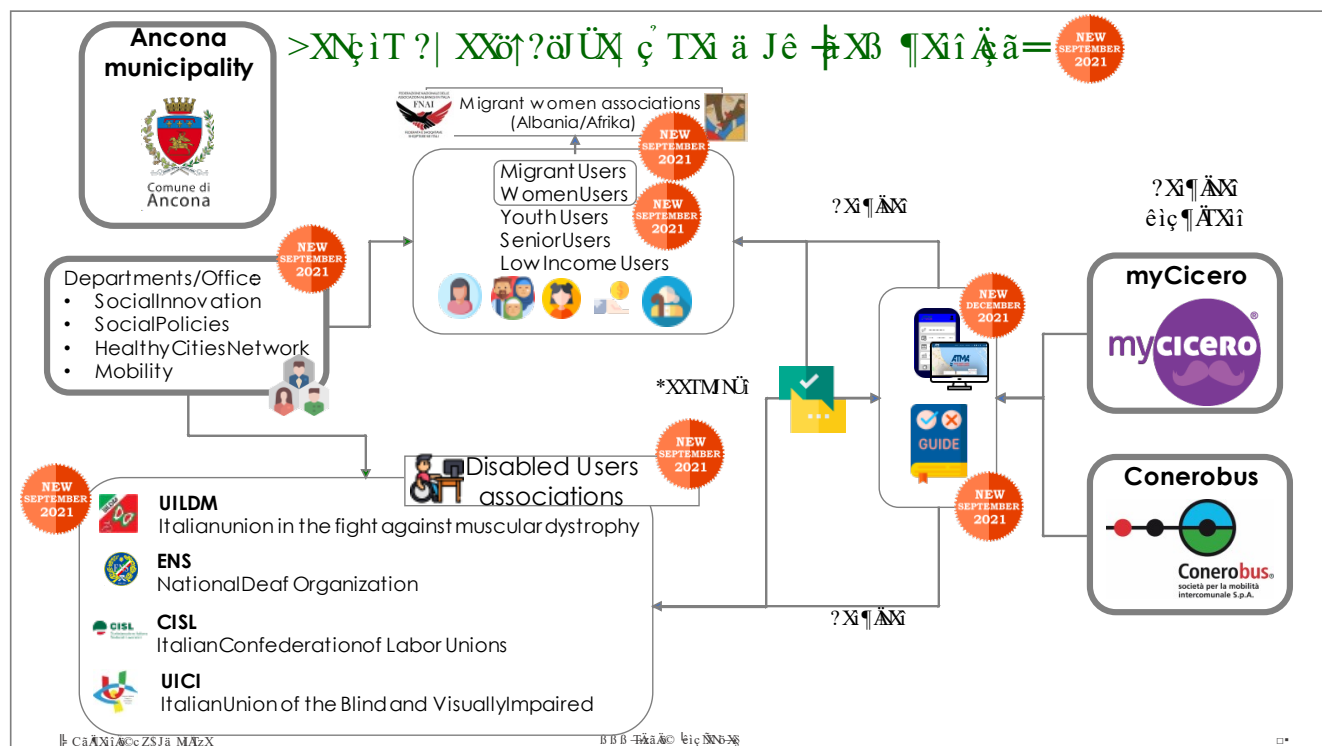


Figure 9: Ancona Explore Phase: Stakeholder map

For *Examine user data*, rather than giving population percentages, the team encapsulated previous experience in a set of five personas. One of these is shown in Figure 10. The personas are presented in a similar way to the Digital exclusion personas developed by the UCAM team (Cambridge Engineering Design Centre, n.d. b; Goodman-Deane et al, 2021). Key aspects mentioned in the personas as their technology competence, use of technology, and mobility and digitalisation.

In *Capture needs*, needs were listed for a wide range of end users, including female, young, migrant, and low-income users, public transport operators, and the service integrator.

In *Identify KPIs*, some potential KPIs were listed such as user growth rate, Google play rate and number of tickets sold, as well as the percentage of the target population who would be excluded from using the service due to the service demands on the user.

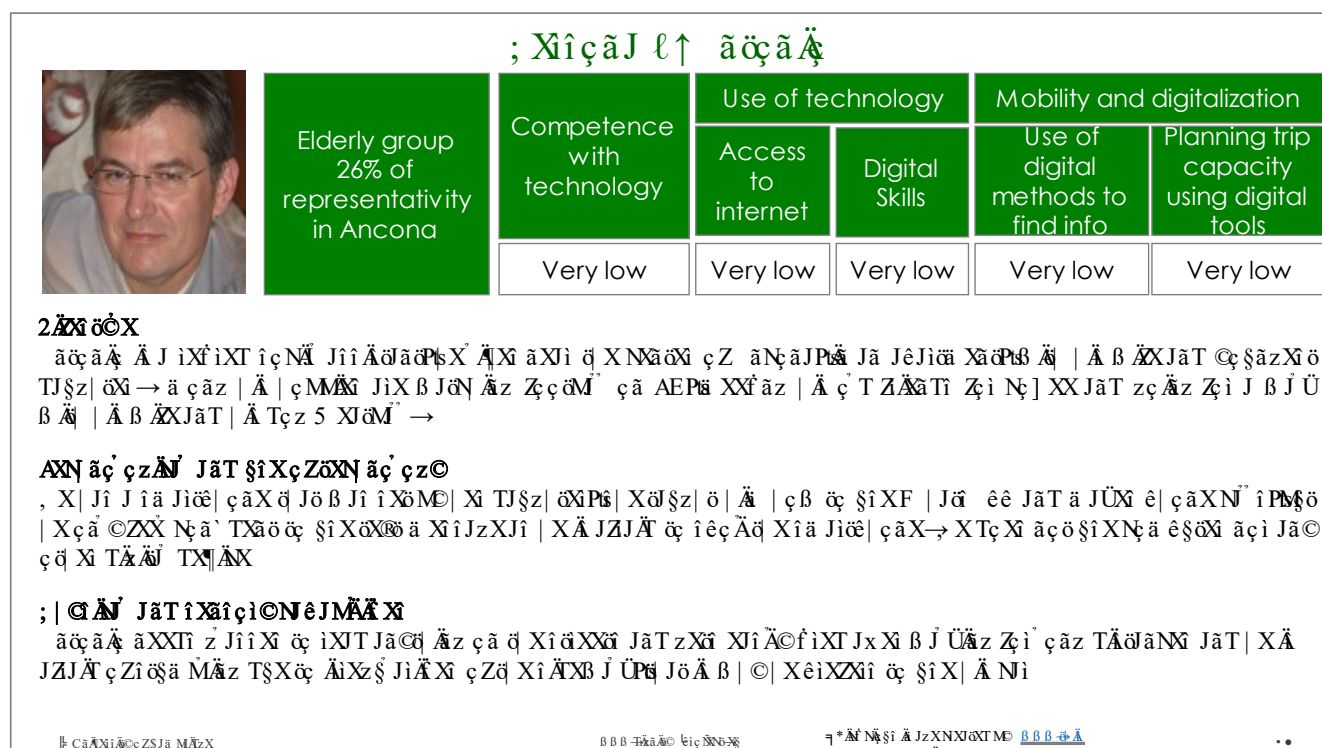


Figure 10: Example persona for an older, non-digital user developed by the Ancona team

#### 4.1.5 Create phase: Co-creation workshop

Due to the COVID-19 situation, the Ancona pilot had to run their co-creation workshop run online. This meant that the most digital excluded people could not participate. To balance this, the pilot team also held some telephone interviews with users early in their pilot work.

Despite the limitations of the co-creation workshop, it was still very inspiring for the team and produced lots of useful ideas. These were grouped by the team into two categories: digital (referring to the app and website) and (primarily) non-digital (ideas to improve mobility more generally, not necessarily digital). Examples of a digital and non-digital idea are shown in Figure 11.

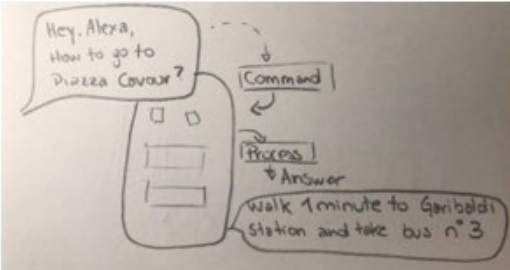


#### Workshop material slide: Stimulate ideas

idea  
submitted  
08/11

An idea...

APP with Alexa built-in (or other AI)



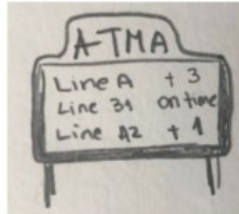
(only one idea per sheet please!)

#### Workshop material slide: Stimulate ideas

idea  
submitted  
08/11

An idea...

Real-time information on bus stop, especially outside the city center and next to touristic areas to reduce the anxiety and keep inform



(only one idea per sheet please!)

Figure 11: Examples of ideas from the Ancona co-creation workshop. Digital ideas are colour coded in green and non-digital ones in blue

### 4.1.6 Create phase: Concepts

After the co-creation workshop, the pilot team developed four concepts based on the ideas:

- An easier app: This included ideas from the co-creation workshop such as having a tutorial on each page, an easy home page, more languages and the provision of training to potential users in how to use the app.
- A more accessible app and ATMA website: Accessibility was a key topic during both the co-creation session and the earlier DIGNITY focus group (which was run during the DIGNITY 'framing the gap' process). In particular, the pilot highlighted the lack of current accessibility for blind and low vision users.
- Bus stops 2.0: The participants in the workshop contributed several ideas for making bus stops more attractive and useful, including bus stop sign upgrades and the provision of real-time travel information.
- Hubs for public transport: Participants in the co-creation workshop expressed frustration about last mile travel, particularly about difficulties with using bicycles to get to/from the bus stops. Ideas included equipping buses to carry bikes and providing car and bike parking near key bus stops.

The pilot team then developed these concepts and delivered the following to UCAM, along with a description of their user testing plan:

- A prototype of a new version of the ATMA app in the prototyping environment Figma. Examples of screens from this prototype are given in Figure 12
- An accessibility audit on their website
- A document detailing seven (mostly non-digital) recommendations for the transport system in the region. These recommendations are summarised in Table 2

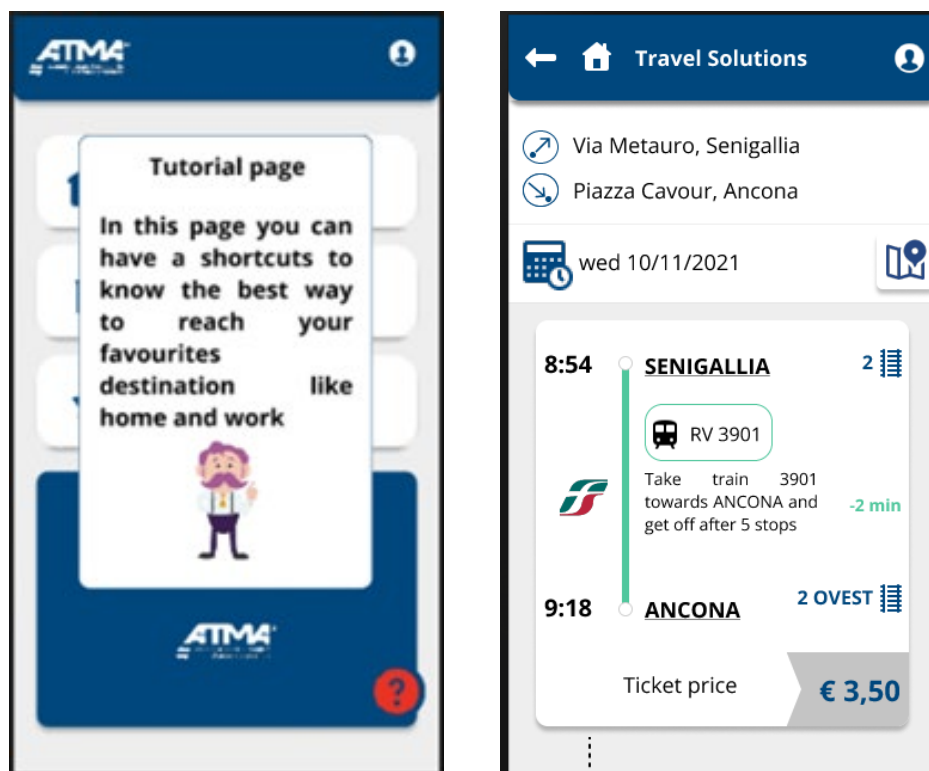


Figure 12: Examples of screens from the Ancona prototype app (before revisions were made to it in response to UCAM feedback – see Section 4.1.7)

Table 2: Recommendations for the transport system in Ancona developed by the pilot team during the IDW process (taken from the pilot's Recommendations and best practices document)

Recommendation title	Recommendation type	Brief details
Multi-lingual city	Digital and non-digital	Provision of multi-lingual information
Fare policy for protected category of users	Digital and non-digital	Improvements in the fare policy for various categories of users
Bicycle and bus promotion	Non-digital	Various suggestions, including adapting buses to carry bikes, and promoting e-bike schemes in the city
Bus stops for boosting public transport	Digital and non-digital	Improving the accessibility of bus stops, provision of real-time travel information at bus stops
Ticketing, validation and activation	Digital and non-digital	Improving the system for validating and activating bus tickets
Training for mobility solutions	Non-digital	Training end-users in using digital devices including apps
Women in public transport	Non-digital	Principles to empower women in transportation

#### 4.1.7 Highlights from the *Evaluate* phase

UCAM provided a feedback document to the pilot. This included formative feedback on the prototype app, the accessibility audit of the website, the seven recommendations, and the pilot's user testing plan, as well as some population exclusion figures.

The feedback identified various aspects of the app that could be improved to make it more usable and inclusive. For example, it recommended that a clear route for cancelling a Tutorial pop-up (shown on the left in Figure 12) should be provided, such as a button labelled 'x' or 'close'. It also recommended that the '?' icon for accessing the tutorial would be better placed in a position where it did not hover over the main content, sometimes obscuring text.

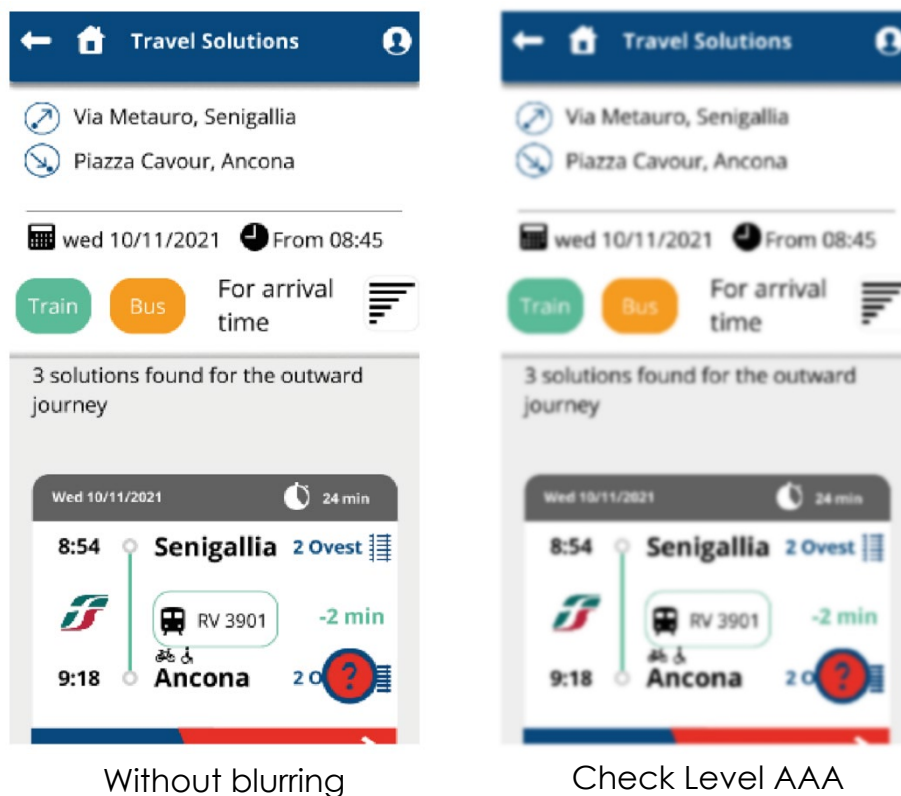


Figure 13: A screenshot from the prototype app without any blurring and with blurring corresponding to Check Level AAA in Clari-Fi Pro (Cambridge Engineering Design Centre, n.d. c).

The UCAM Clari-Fi tool (Cambridge Engineering Design Centre, n.d. c) was used to examine the visual clarity of screens in the prototype app and to identify visual elements that needed improvement. An example of this is given in Figure 13. The blurred version of the screen, after applying Clari-Fi Check Level AAA, is shown on the right in this figure. It indicates that most of the elements have reasonable visual clarity. However, some elements (such as the bicycle and wheelchair icons, and the text in the dark grey bar) are not easily identifiable at this level

of visual clarity checking. The pilot team improved the visual clarity of these and other elements in response to this feedback.

The feedback document also included Italian population exclusion figures for services and tasks that are commonly involved in digital mobility services, including in various aspects of the Ancona concepts. The exclusion figures are given in Table 3. These figures can be used to compare different alternatives, to help choose between them and to identify aspects that particularly need improvement.

Table 3: Population exclusion estimates produced for the Ancona pilot. Estimates of the exclusion associated with different kinds of services and tasks that are commonly involved in digital mobility services. The exclusion values are based on the DIGNITY Italian dataset (n=1002 participants).

Service / Task requires ...	Excludes survey participants who ... <sup>1</sup>	Exclusion <sup>2</sup>	N valid <sup>3</sup>
the user to have <b>a mobile phone</b>	do not have access to a mobile phone or any kind (or do not know if they have access to one)	8.8%	1002.0
the user to access <b>a website that has been designed to work on both mobile and desktop</b> (This requires availability of Internet)	last used the Internet more than three months ago <sup>4</sup>	21%	1001.4
the user to access <b>a website while out and about</b> (This requires availability of Internet on a smartphone)	last used the Internet on a smartphone more than three months ago	21.5%	1000.4

<sup>1</sup> The description of which survey participants are excluded refers to variables collected in the survey. Sometimes the ideal variables were not collected in the survey, and proxy variables (that are as close as possible to the demands of the service/task) are used instead.

<sup>2</sup> Exclusion is expressed as a weighted percentage of valid responses to the variable(s) involved in the calculation.

<sup>3</sup> N valid refers to the weighted number of participants who had valid responses to the variable(s) involved in the calculation. As such it varies between rows in the table. The Italian dataset was weighted, so N valid is not always a whole number and is reported to one decimal place.

<sup>4</sup> Data on Internet access was collected but was less reliable than the data on the frequency of internet use. Hence, frequency data was used in the exclusion calculations.

the user to access <b>a website on a desktop or laptop computer</b> (i.e., via a website that has been designed for desktop, but has poor experience on mobile) (This requires availability of a computer AND availability of Internet)	last used a computer more than three months ago OR last used the Internet more than three months ago	41.9%	998.9
the use of <b>a smartphone app that needs to be installed on a smartphone and requires an internet connection</b> (This requires app installation AND availability of internet on smartphone)	haven't installed an app in the last year OR last used the Internet on a smartphone more than three months ago	58.7%	998.7
<b>confidence planning travel on computer</b>	have low confidence <sup>5</sup> planning an unfamiliar, public transport journey on a (desktop or laptop) computer	30.8%	1002.0
<b>confidence planning travel on smart phone</b>	have low confidence <sup>5</sup> planning an unfamiliar, public transport journey on a smartphone	29.3%	1002.0
<b>confidence planning travel using a system that is available on both a computer and a smartphone</b>	have low confidence <sup>5</sup> planning travel on a computer AND low confidence planning travel on smartphone	27.9%	1002.0
<b>previous experience with a mapping application</b>	have not used a mapping application in the last 12 months	63.6%	1002.0
<b>good distance-vision ability</b> (e.g., reading fine detail on signage, display boards or TV adverts)	very limited in daily activities due to vision (N.B. This general indicator of vision is not necessarily about distance vision, but it is the only variable in the survey that covers distance vision in any way)	4.4%	993.2

<sup>5</sup> People with low confidence were defined as those rating their confidence between 1 and 3 (inclusive) on the 10-point scale.

the user to have <b>at least a moderate desire to engage with technology</b>	have a low Affinity for Technology Interaction (ATI) score <sup>6</sup> (i.e., completely or largely disagrees on average <sup>7</sup> with statements that indicate a positive affinity for technology interaction)	39.3%	1002.0
the user to be <b>able to recover from errors</b>	completely or largely disagree <sup>7</sup> with the statement "If I tap on the screen or press a button and something happens that wasn't what I expected, I can usually sort it out by myself"	27.4%	1002.0
the user to be <b>willing to explore an unfamiliar technology interface</b>	Completely or largely disagree <sup>7</sup> (on average) with statements that indicate willingness to explore an unfamiliar interface	22.4%	1002.0

The Ancona pilot has already acted on several of the UCAM feedback comments and recommendations in the next iteration of the prototype and the next version of the recommendations document.

The pilot team planned to conduct user testing on the prototype app after the parts of the IDW process that are reported on in this deliverable. They initially planned to conduct this online. However, after feedback from UCAM, they decided to do it in person to enable a more representative sample of end users to take part. This will help to identify a wider range of usability and inclusivity issues and will thus be more effective in improving the app.

#### 4.1.8 Reflections on the IDW process

The pilot started with a focus on improving the accessibility of the app. We feel that a key contribution of the IDW process and the co-creation workshop was in helping the pilot to look beyond the app and to think about the needs of digitally excluded people (e.g., non-smartphone users and people without internet access). The process can also help teams to move beyond accessibility (e.g., asking the question 'can someone with an impairment perceive the information if they look in the right place?') to usability and inclusivity (e.g., 'how easy is the information to find and understand, both for people with impairments and for a wider range of users?').

<sup>6</sup> See <https://ati-scale.org/> for more details on the ATI scale.

<sup>7</sup> Completely or largely disagree corresponds to scores below 3 on a scale from 1 to 6.



#### 4.1.9 Reflections on the pilot impact

The Ancona pilot work developed a prototype of a new version of the ATMA app, which provides integrated transport information and ticketing. The new version would include various usability and accessibility improvements, such as improvements in visual clarity and accessibility, a 'quick travel solutions' page and tutorials on the use of the app. These should reduce exclusion for people with vision impairments and those with lower levels of digital competence. The new version would also provide travel information in a larger number of languages, making it more inclusive for migrants and visitors to Ancona.

The analysis conducted within the DIGNITY pilot work also equips myCicero to improve the accessibility and inclusivity of other white label apps that they provide to other customers. For example, they are currently in the process of re-designing an application for a customer in the south of Italy.

The pilot also conducted an accessibility audit of the ATMA portal website. The audit identified various issues and gave recommendations on how to address these. Doing so will make the website more accessible and thus inclusive of people with various disabilities.

A set of recommendations for the transport system in Ancona was also produced. The impact of these will depend on how exactly they are implemented in practice, but they have the potential to reduce exclusion for various groups of people, including migrants and visitors, people on a low income, people with lower digital competence and women.

## 4.2 *Barcelona*

### 4.2.1 Introduction

The Barcelona Metropolitan Area is an urban area in Spain, centred on the city of Barcelona. The DIGNITY partners for the Barcelona pilot were Factual Consulting and Barcelona Regional. Factual Consulting is a foresight innovation consultancy focused on mobility. Barcelona Regional is a public institution dedicated to strategic, urban, and infrastructural planning. In addition, the pilot involved various stakeholders in specific IDW activities.

The individuals involved in the pilot were:

- Carola Vega, Marc Figuls: Factual Consulting
- Mercedes Vidal, Cristina Jiménez, Adrià Ortiz: Barcelona Regional

The Barcelona pilot started by looking at a carpooling case study, with the following goal:

- To promote the use of carpooling in industrial parks (areas with low public transport coverage), integrating the needs of users, mainly factory and office employees.

Later on, a second case study was added, examining demand-responsive transport (DRT). This focused on an existing DRT service from an outlying part of the Barcelona Metropolitan Area to Barcelona City. At the start of the pilot work, users could book a seat on this service using a smartphone app or by phoning a call centre. This case study had the following goals (see next page):

- To promote the use of DRT among groups with low digital competence
- To develop a mock-up of a simplified version of the smartphone app that offers a more inclusive and user-friendly reservation process

There were difficulties organising a co-creation workshop for the first case study (carpooling), as explained in Section 4.2.2. As a result, the Barcelona pilot shifted focus to the DRT case study in Feb 2022. However, the pilot team considers that the earlier work on the carpooling case was helpful in planning and building the DRT work. Therefore, this section reports on the initial work on the carpooling case, in addition to the DRT work.

## 4.2.2 Overview of Barcelona's IDW process

Table 4 on the next page shows a high-level timeline of the Barcelona IDW activities after the initial training workshop in Feb 2021. These are categorised into the *Manage*, *Explore*, *Create* and *Evaluate* IDW phases. The timeline shows the activities for both the carpooling and DRT case studies. Activities that are specifically for the carpooling case are noted as such and are also in dark red text. When the table mentions information being added or sections being filled in, it refers to the Barcelona IDW design log.

The main work on the IDW started with a meeting with UCAM on the 2<sup>nd</sup> June 2021. Prior to this, the Barcelona pilot team had completed the DIGNITY customer journey mapping work. The DIGNITY survey in the Barcelona Metropolitan Area was also completed before this date.

After the June meeting, the team started work on the carpooling case, examining how to promote the use of carpooling in industrial parks on the outskirts of Barcelona. In the next few months, they filled in the *Manage* and *Explore* sections of the design log for this case. They also carried out the DIGNITY scenario building work in June and July. In September, they started to plan their co-creation workshop for the carpooling work.

In October, the team identified a second use case for transport in the region, focusing on demand responsive transport (DRT). As a result, they started work on the case study examining DRT in parallel with the carpooling work.

They ran both cases in parallel until the start of Feb 2022 when they decided that it would not be possible to run a co-creation workshop for the carpooling work within the timeframe of the DIGNITY IDW work. This was due to COVID restrictions in COTY, the company from the industrial park who was involved in the car-pooling case study and whose employees were supposed to take part in the workshop. As a result, IDW activities after this date focused on the DRT case study.

The co-creation workshop for the DRT work was held on the 9<sup>th</sup> of February. The pilot team then developed various concepts based on the ideas from this workshop. They delivered to UCAM descriptions of three concepts and two sets of proposals for improving pages in the app for the DRT service. These are described in Section 4.1.6. After receiving formative feedback from UCAM, the pilot sent UCAM a set of proposed actions to address some of this feedback.



Table 4: Timeline of activities conducted in the Barcelona IDW pilot.

	Key activities			
Month	Manage	Explore	Create	Evaluate
Before June 2021		Other DIGNITY activities, e.g., customer journey mapping		
Jun 2021	Initial meeting with UCAM	Initial draft of Explore section for carpooling case	Other DIGNITY activities: Scenario building	
Jul 2021				
Aug 2021	Filled in Manage section for carpooling case	Revised Explore section for carpooling case		
Sep 2021			Preparation for carpooling co-creation workshop	
Oct 2021	Started DRT case study. Filled in Manage section for DRT case.	Started to fill in Explore section for DRT case. Identification of potential KPIs for carpooling case.	Preparation for carpooling and DRT co-creation workshops	Started thinking about evaluation mechanisms for carpooling case
Nov 2021	Updates to Manage	Updates to Explore for carpooling case	Continued preparation for carpooling and DRT workshops. Conceptualisation and definition of technology aspects for carpooling app.	
Dec 2021				
Jan 2022		Details added to Explore for DRT case		
Feb 2022	Decided to focus on DRT case study	Co-creation workshop for DRT case (including both Explore and Create elements)		
		Added to stakeholder map and customer journey for DRT case	Developed concepts.	
Mar 2022				Formative feedback from UCAM
Apr 2022			Proposed actions in response to UCAM's feedback	UCAM sent feedback on the proposed actions. Final feedback from UCAM

In April, UCAM provided feedback on these proposed actions and final feedback on the concepts. This included population exclusion figures for various services and tasks that are commonly involved in digital mobility services. Further work will modify the concepts and mock-ups based on the feedback.

Providing full details of all the activities is outside of the scope of this report, but some key aspects of each phase in the DRT work are described in the following sections.

### 4.2.3 Manage phase: Highlights

The Barcelona team engaged with the *Manage* phase and kept the *Manage* section of the design log updated. They used separate copies of the design log for the carpooling and DRT work. They also added an additional slide (shown in Figure 14) at the start of the DRT design log to explain the two cases.

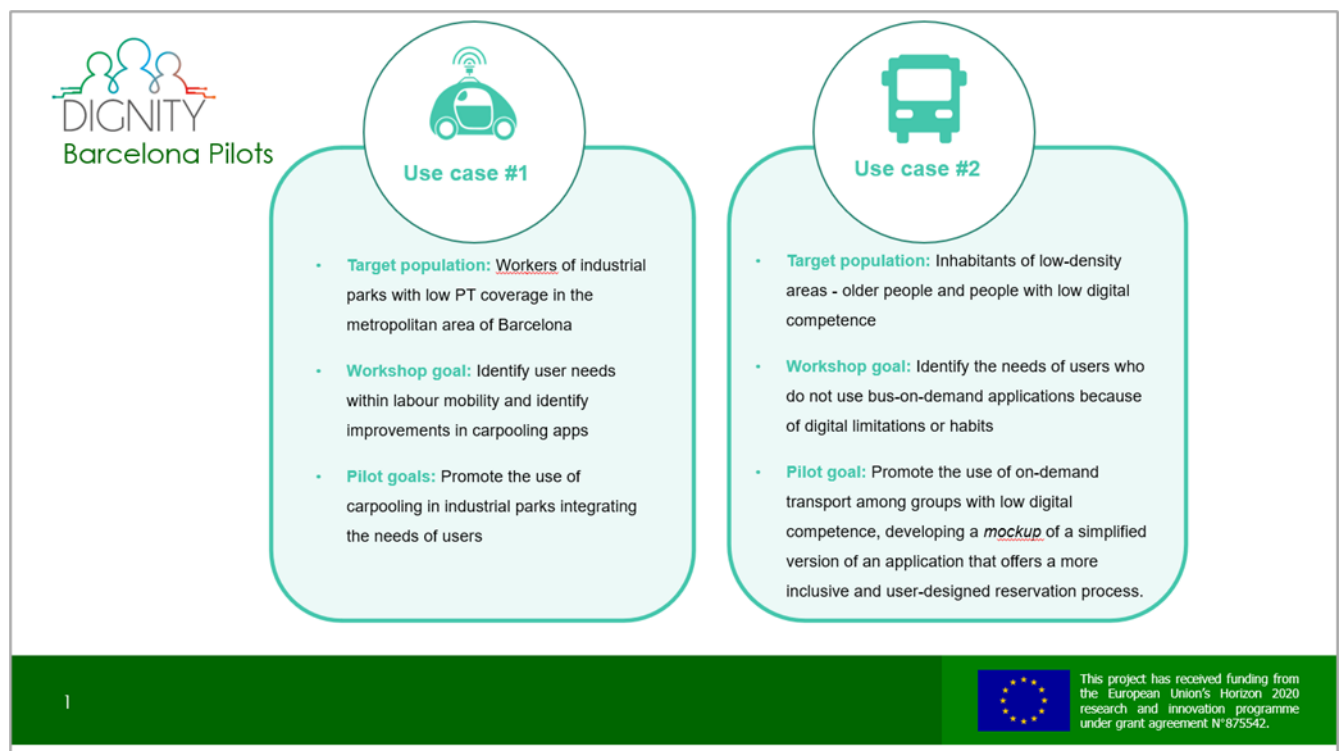


Figure 14: An additional slide added by the Barcelona pilot to give an overview of their two case studies

### 4.2.4 Explore phase: Highlights

The Barcelona pilot team completed all of the activities in *Explore* for both the carpooling and DRT case studies. Some of the *Explore* work done for the carpooling case informed the DRT work as well.

On the DRT case study, the pilot team produced both a stakeholder list and a stakeholder map. The stakeholder map is shown in Figure 15 and used the template provided by UCAM.

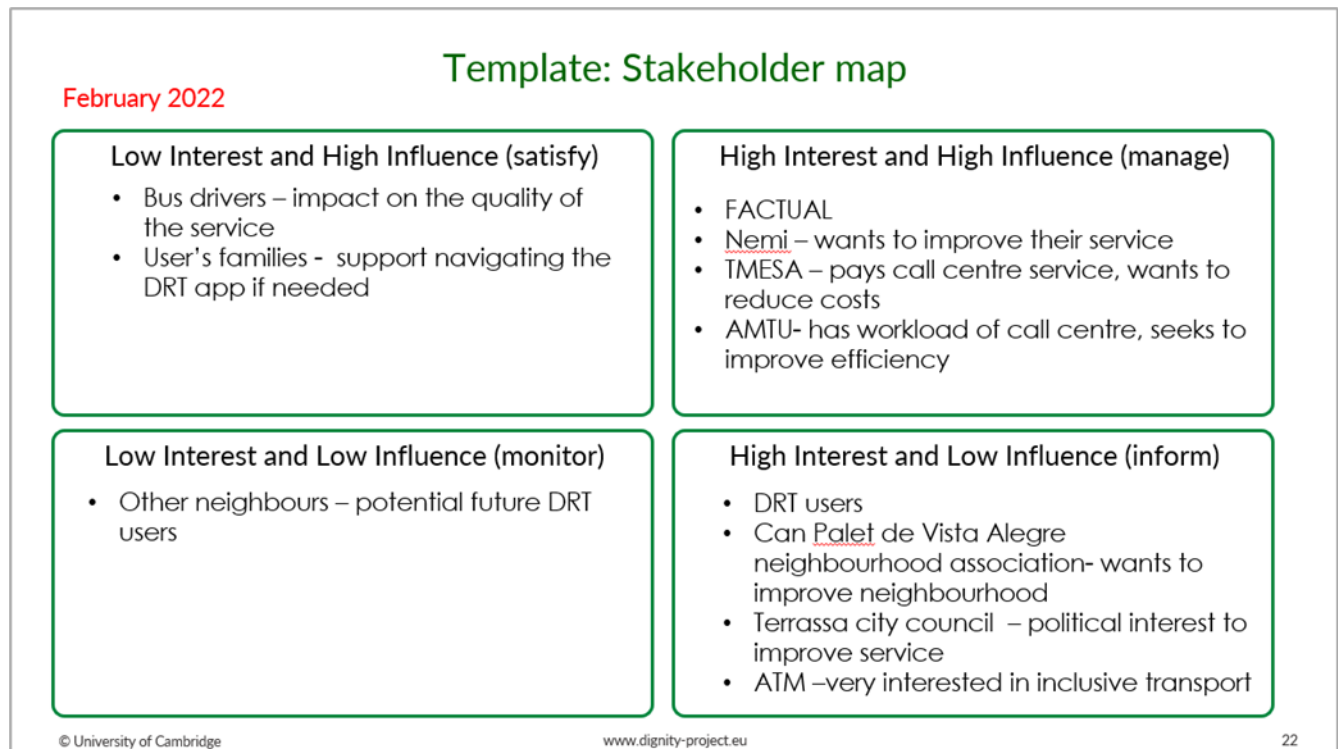


Figure 15: Barcelona Explore phase: Stakeholder map

The customer journey description was created specifically for the carpooling work because the DIGNITY customer journey mapping activity examined a more general trip to work by public transport (see Bracke et al, 2021). The overall journey is shown in Figure 16. Each step was described in detail on another slide as shown in the example in Figure 17.

Some statistics about the target user group were included in *Examine user data*. These focused on the particular area (Con Palet) and DRT service involved in the pilot. They included how many people had used the DRT line since the service launched in June 2020, how many booked the service through the phone line and how many through the app.

In *Capture needs*, needs were listed for residents of Con Palet, the neighbourhood association, the app provider, the transport operator and the city council.

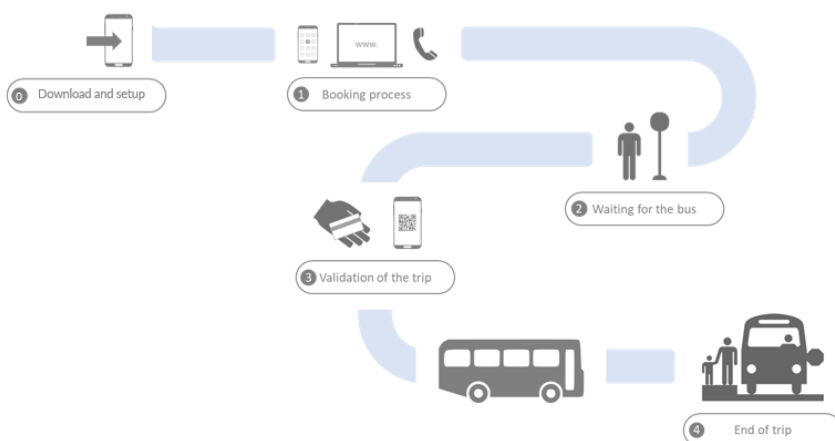
In *Identify KPIs*, two sets of KPIs were listed. One set focused on the types of people participating in the co-creation workshop, to ensure a good sample of participants. The other set were KPIs for the service after any improvements identified in the case study are implemented. They included indicators such as the number of active users of the DRT service and the proportion of reservations made through the app.

## Record sheet: Customer journey

February 2022



### Nemi DRT app current customer journey



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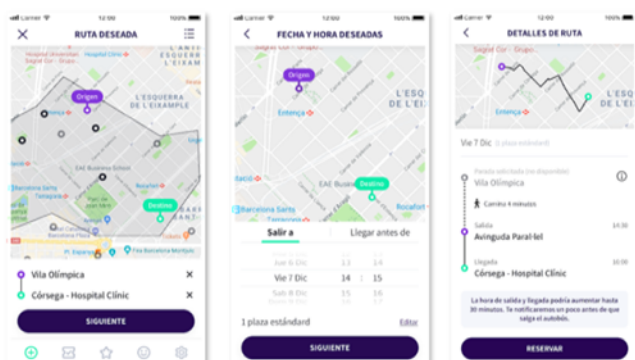
Figure 16: Barcelona Explore phase: Overview of customer journey

## Record sheet: Customer journey

February 2022



**1. Booking process:** When the user wants to request a trip, he/she will have to indicate the origin of the trip, the destination, and the date. The system will provide different booking options with the most convenient combinations of stops and pick-up times.



- The user indicates the origin (an address or their position) and destination of their trip, as well as the day and the bus expedition he/she wants to join.
- If the user wishes to make a booking for a closed expedition, he/she will be able to check the final route and schedule of the expedition and select one stop within the route.
- It will be possible to cancel the booking at any time. There won't be any penalty as long as it's cancelled before the closure of the expedition route (15 min before departure).

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Figure 17: Barcelona Explore phase: Detail of one of the steps in the customer journey

#### 4.2.5 Create phase: Co-creation workshop

The co-creation workshop for the DRT work was held in person in Feb 2022. It lasted about 3 hours and took place in a room in the neighbourhood association. 13 people took part, including 3 over the age of 65 (one of whom was over 80). 38% of participants considered themselves to be low or medium/low technology users.

The workshop examined current mobility patterns and technology use, challenges in mobility and solutions, ideas for the improving the DRT service and testing of the current app for the DRT service.

Figure 18 gives some examples of the outputs generated from the workshop, describing some of the barriers in public transport and ideas/concepts generated.

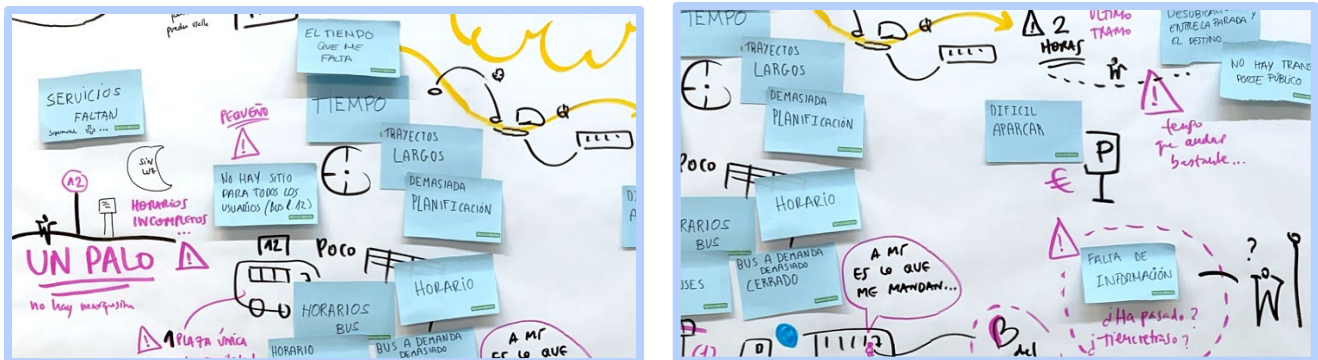


Figure 18: Examples of outputs from the Barcelona co-creation workshop

#### 4.2.6 Create phase: Concepts

After the co-creation workshop, the pilot team developed three (mostly non-digital) concepts for improving the DRT service and produced short descriptions of each, as shown in the example in Figure 19. The three concepts were:

- A double shuttle service composed of two connected lines
- Virtual stops that can change position according to users' needs
- Smart bus posts or screens at bus stops providing real-time information and a facility for communicating with the bus operator, e.g., to make a reservation

They also produced two sets of proposals for improving pages in the app for the DRT service. These included text descriptions of some of the current issues in the app, and text descriptions of improvements, alongside markups on screenshots from the existing app and rough mock-ups of new pages. Some examples of the latter are shown in Figure 20.



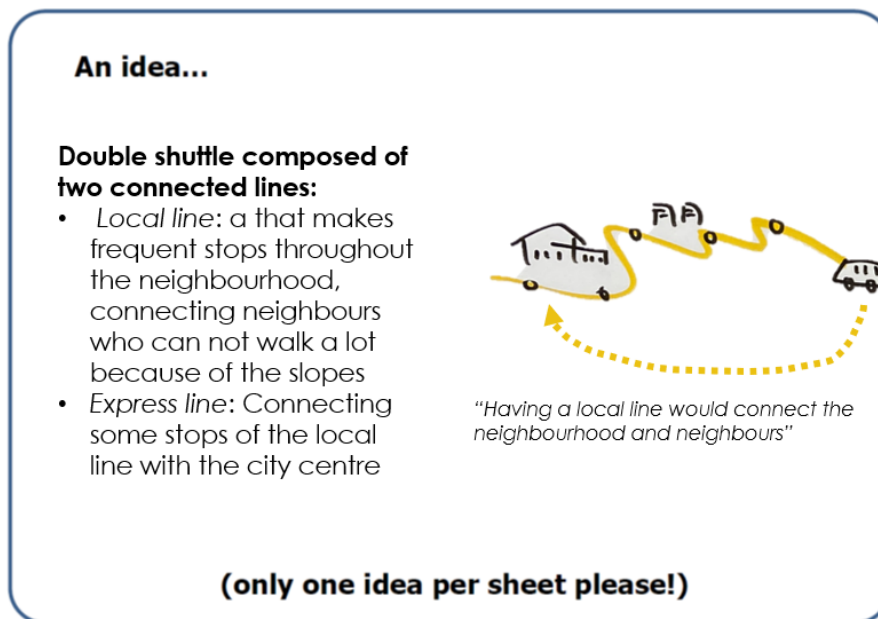
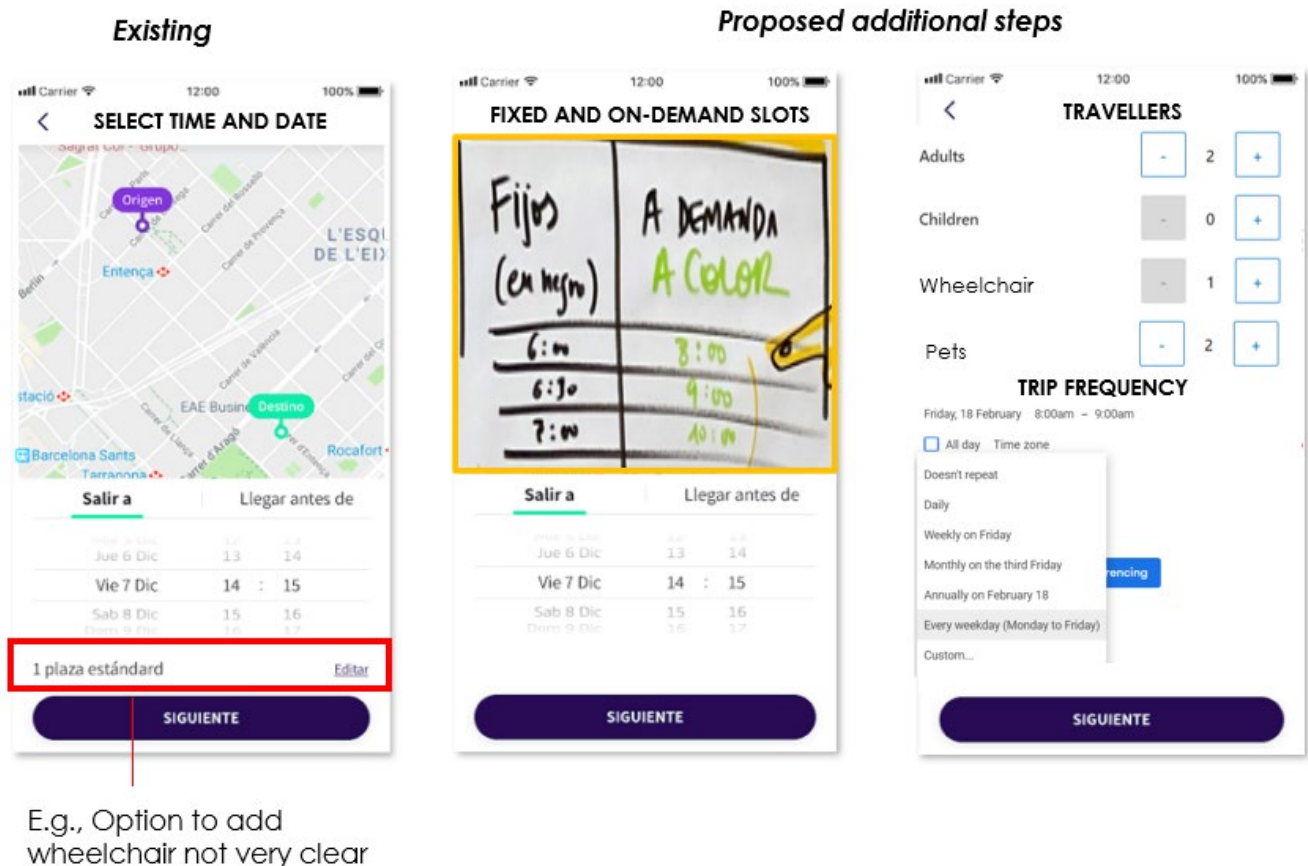


Figure 19: One of the concepts from the Barcelona DRT case study



E.g., Option to add wheelchair not very clear

Figure 20: One of the sets of suggestions of improvements to the DRT app

#### 4.2.7 Evaluate phase: Highlights

UCAM provided a feedback document to the pilot. This included formative feedback on the three concepts and two sets of proposals for the app, as well as some population exclusion figures.

The feedback discussed possibilities and potential issues with the concepts, such as the need for communicating the double routes (and the consequent need to change buses) clearly to users in the app.

UCAM agreed that the pilot's proposals for improving the app would be helpful, and encouraged them to develop these further as well as considering other issues with the current app. They identified various aspects of the current app that could be improved to make it more usable and inclusive. For example, it identified icons that are likely to cause confusion for users with less digital experience or who are not familiar with the system. Another issue is potential confusion surrounding the ways in which stops are displayed on the map.

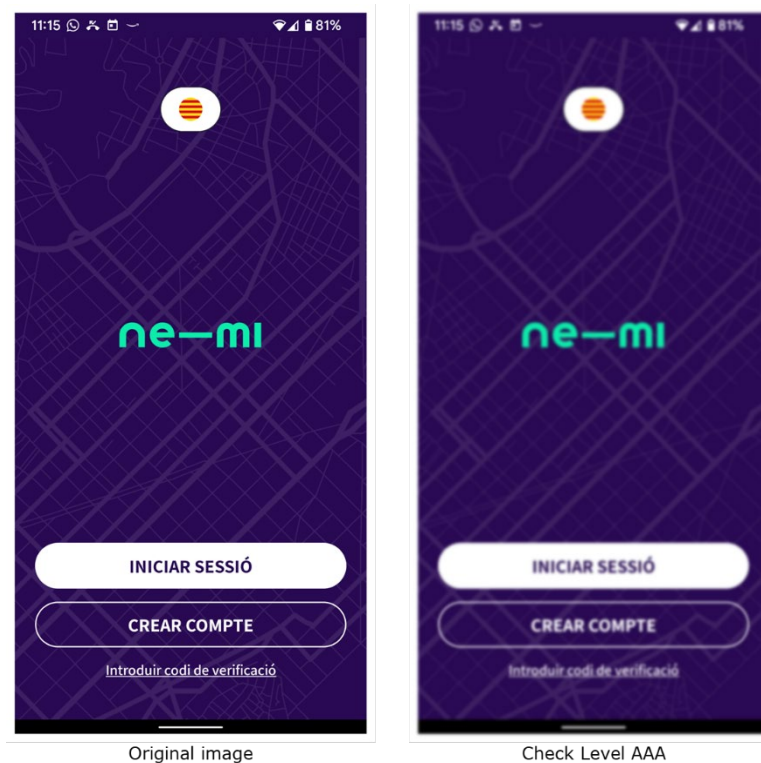


Figure 21: The home screen from the current app without any blurring and with blurring corresponding to Check Level AAA in Clari-Fi Pro (Cambridge Engineering Design Centre, n.d. c).

The UCAM Clari-Fi tool (Cambridge Engineering Design Centre, n.d. c) was used to examine the visual clarity of the current app. An example of this is given in Figure 21. The blurred version of the screen, after applying Clari-Fi Check Level AAA, is shown on the right in this figure. It indicates that some of the elements, such as the main buttons on the home screen, have

reasonable visual clarity. However, some elements (such as the text for the validation code at the bottom of the home screen) are not easily identifiable at this level of visual clarity checking.

The feedback document also included population exclusion figures for the Barcelona Metropolitan Area for services and tasks that are commonly involved in digital mobility services, including in various aspects of the Barcelona concepts. The exclusion figures are given in Table 5. These figures can be used to compare different alternatives, to help choose between them and to identify aspects that particularly need improvement.

Table 5: Population exclusion estimates produced for the Barcelona pilot. Estimates of the exclusion associated with different kinds of services and tasks that are commonly involved in digital mobility services. The exclusion values are based on the DIGNITY dataset for the Barcelona Metropolitan Area (n=601 participants).

Service / Task requires ...	Excludes survey participants who ... <sup>8</sup>	Exclusion <sup>9</sup>	N valid <sup>10</sup>
the user to have <b>a mobile phone</b>	do not have access to a mobile phone or any kind (or do not know if they have access to one)	3.0%	601
the user to access <b>a website that has been designed to work on both mobile and desktop</b> (This requires availability of Internet)	last used the Internet more than three months ago <sup>11</sup>	8.8%	600
the user to access <b>a website while out and about</b> (This requires availability of Internet on a smartphone)	last used the Internet on a smartphone more than three months ago	15.9%	598

<sup>8</sup> The description of which survey participants are excluded refers to variables collected in the survey. Sometimes the ideal variables were not collected in the survey, and proxy variables (that are as close as possible to the demands of the service/task) are used instead.

<sup>9</sup> Exclusion is expressed as a weighted percentage of valid responses to the variable(s) involved in the calculation.

<sup>10</sup> N valid refers to the weighted number of participants who had valid responses to the variable(s) involved in the calculation. As such it varies between rows in the table. The Italian dataset was weighted, so N valid is not always a whole number and is reported to one decimal place.

<sup>11</sup> Data on Internet access was collected but was less reliable than the data on the frequency of internet use. Hence, frequency data was used in the exclusion calculations.



the user to access <b>a website on a desktop or laptop computer</b> (i.e., via a website that has been designed for desktop, but has poor experience on mobile) (This requires availability of a computer AND availability of Internet)	last used a computer more than three months ago OR last used the Internet more than three months ago	26.7%	600
the use of <b>a smartphone app that needs to be installed on a smartphone and requires an internet connection</b> (This requires app installation AND availability of internet on smartphone)	haven't installed an app in the last year OR last used the Internet on a smartphone more than three months ago	38.7%	597
<b>confidence planning travel on computer</b>	have low confidence <sup>12</sup> planning an unfamiliar, public transport journey on a (desktop or laptop) computer	14.3%	587
<b>confidence planning travel on smart phone</b>	have low confidence <sup>12</sup> planning an unfamiliar, public transport journey on a smartphone	14.6%	584
<b>confidence planning travel using a system that is available on both a computer and a smartphone</b>	have low confidence <sup>12</sup> planning travel on a computer AND low confidence planning travel on smartphone	11.7%	574
<b>previous experience with a mapping application</b>	have not used a mapping application in the last 12 months	29.3%	600
<b>good distance-vision ability</b> (e.g., reading fine detail on signage, display boards or TV adverts)	very limited in daily activities due to vision (N.B. This general indicator of vision is not necessarily about distance vision, but it is the only variable in the survey that covers distance vision in any way)	5.8%	600

<sup>12</sup> People with low confidence were defined as those rating their confidence between 1 and 3 (inclusive) on the 10-point scale.

the user to have <b>at least a moderate desire to engage with technology</b>	have a low Affinity for Technology Interaction (ATI) score <sup>13</sup> (i.e., completely or largely disagrees on average <sup>14</sup> with statements that indicate a positive affinity for technology interaction)	28.2%	564
the user to be <b>able to recover from errors</b>	completely or largely disagree <sup>14</sup> with the statement "If I tap on the screen or press a button and something happens that wasn't what I expected, I can usually sort it out by myself"	18.8%	595
the user to be <b>willing to explore an unfamiliar technology interface</b>	Completely or largely disagree <sup>14</sup> (on average) with statements that indicate willingness to explore an unfamiliar interface	18%	590

After receiving the initial draft of the feedback from UCAM, the Barcelona pilot team formulated a set of proposed actions for addressing the issues identified in the feedback. UCAM provided feedback on these actions, for example, agreeing that an action would be helpful or suggesting that a modification to the action would be more effective.

#### 4.2.8 Reflections on the IDW process

The pilot was hampered by difficulties with COVID restrictions and the local company stakeholder on the carpooling case study. This meant that the co-creation workshop kept being postponed and the pilot eventually had to move at a late stage to focus on the DRT case study instead. Nevertheless, the pilot team moved quickly on the DRT work and managed to organise a useful in-person co-creation workshop with a good mix of participants within the timeframe of the DIGNITY IDW work. Partly because the co-creation workshop was later than originally intended, the concepts and proposals for the app were described at a high level rather than developed in detail. However, it was possible to give detailed feedback on these concepts which should position the pilot well for the next round of iteration on the IDW.

This iteration is not covered within the timeframe of the DIGNITY IDW work but is an integral and important part of the IDW. Ideally the iteration involves revisiting the *Explore* phase and considering whether the results of the co-creation workshop and feedback from UCAM affect the pilot team's understanding of the needs of the users and other stakeholders. The *Create* phase is also revisited and the concepts are modified in response to feedback before being developed in more detail, perhaps to a working prototype of the app, which could then be tested with users as part of a future *Evaluate* phase.

<sup>13</sup> See <https://ati-scale.org/> for more details on the ATI scale.

<sup>14</sup> Completely or largely disagree corresponds to scores below 3 on a scale from 1 to 6.

## 4.2.9 Reflections on the pilot impact

The DRT work has identified improvements to the app for the DRT service that would make it more usable, especially for users with lower levels of digital competence. Implementing these improvements could increase the numbers and types of people who use the app and make it more inclusive. It is still important to provide a telephone service for bookings because many users do not have access to a smartphone. However, making the app more inclusive will help to reduce the demand on the telephone service and make the service as a whole more efficient.

The pilot team also created some proposals for improving the DRT service in (mostly) non-digital ways. These concepts need further work to determine how they would be implemented in practice, but they have the potential to improve the service so that it meets users' needs better.

## 4.3 Flanders

### 4.3.1 Introduction

Flanders is a region of Belgium with 15 transport regions, including the city of Antwerp. The DIGNITY partner for the Flanders pilot was the Flanders Department of Mobility and Public Works (MOW). This is a government department focusing on mobility and transport.

The individuals involved in the pilot were:

- Justine De Leersnyder, Anne-Marie Van Wesemael, Shila Abdi: MOW
- Odette Buntinx: Project manager Hoppincentrale, MOW

The goal of the pilot was:

- To develop Hoppincentrale for Flanders as the central point of contact for end users for public transport questions and planning trips via an app, website or call centre. The Hoppincentrale will help potential end-users to find out which means of transport is best for their trip and where they have to transfer. If end-users are not able to take regular public transport (e.g. due to disability), they will be able to use Flex plus transport which will provide a door-to-door trip. In the longer term, end-users will be able to buy a ticket via Hoppincentrale for their entire journey using multiple means of transport.

Overview of Flanders's IDW process

Table 6 shows a high-level timeline of the Flanders IDW activities after the initial training workshop in Feb 2021. These are categorised into the *Manage*, *Explore*, *Create* and *Evaluate* IDW phases. When the table mentions information being added or sections being filled in, it refers to the Flanders IDW design log.

Table 6: Timeline of activities conducted in the Flanders IDW pilot

	Key activities			
Month	Manage	Explore	Create	Evaluate
<b>Before Sep 2021</b>		Other DIGNITY activities, e.g. customer journey mapping		
<b>Sep 2021</b>	Initial meeting with UCAM	Other DIGNITY activities: Completion of survey	Other DIGNITY activities: Scenario building	
<b>Oct 2021</b>				
<b>Nov 2021</b>	Meeting with UCAM to get new staff member started on the pilot work. Meeting with Hoppincentrale to discuss the pilot work.	Initial draft of <i>Explore</i> section	Scenario building results added to design log	
<b>Dec 2021</b>	Meeting with UCAM to review design log		Development of some initial ideas and a beta 1 version of the app <sup>15</sup> . Planning for co-creation workshop	
<b>Jan 2022</b>		Preparation for co-creation workshops. First workshop (included both <i>Explore</i> and <i>Create</i> elements)		User testing of beta 1 version of app (conducted by the Hoppincentrale team)
<b>Feb 2022</b>	Stakeholder meeting with the Hoppincentrale team	Second and third workshops (included both <i>Explore</i> and <i>Create</i> elements)		Results of user testing presented to pilot team and to the 15 transport regions of Flanders
			Development of ideas from workshop into five concepts.	
<b>Mar 2022</b>			Work on concepts	

<sup>15</sup> The dates for the development of the beta 1 version of the app are approximate

<b>Apr 2022</b>			More detail on two of the concepts (app and training) sent to UCAM	Feedback from UCAM
<b>After Apr 2022</b>			Improvement to the app and testing of the resultant beta 2 version. Further development of training for transport personnel.	Testing of beta 2 version of the app.

There was some delay in starting the pilot work in Flanders due to staffing issues. As a result, the initial meeting was held in Sep 2021, with a further meeting with UCAM in Nov 2021. After this meeting, the pilot team added information to the *Explore* section of the IDW design log and entered the results of the scenario building into the *Create* section.

It had already been decided that an app would be valuable for supporting the new Hoppincentrale, so work was conducted on developing a first beta version of this app, as well as developing some other initial ideas. The work on the app was conducted by the Hoppincentrale team under the supervision of Odette Buntinx. This team is also part of MOW but work solely on the implementation of Hoppincentrale.

In Jan and Feb 2022, the pilot team held a set of three co-creation workshops with end users. These included aspects of *Explore* (examining the challenges that users face) as well as *Create* (stimulating ideas for addressing the challenges). The team then developed ideas from the workshop into a set of five concepts.

After this, the pilot team chose two of the concepts to explore further. In April 2022, they delivered more detail on these concepts to UCAM. UCAM then provided feedback on all the concepts, with a focus on the two concepts that were described in more detail.

Providing full details of all the IDW activities is outside of the scope of this report, but some key aspects of each phase are described in the following sections.

### 4.3.2 Manage phase: Highlights

In the early stages of the pilot, the pilot team identified the pilot goals (see Section 4.3.1) as well as the target users who are currently being excluded. The team was aware of some potential big issues, such as staffing problems and difficulties recruiting older people to join the co-creation workshops. The COVID-19 pandemic was seen as a factor that might bring additional difficulties.

The pilot team consisted of personnel within the MOW. A common understanding and shared vision were reached during many discussions. As part of this, terminology was agreed, such as using the term 'Hoppincentrale' instead of Mobiliteitscentrale. Good communication within the MOW was also established in these meetings.

### 4.3.3 Explore phase: Highlights

In the *Stakeholder map* activity, the pilot team produced a stakeholder list with 16 groups of stakeholders, including vulnerable-to-exclusion end-users, end-users' families and friends, bus and taxi drivers, mobility providers, policy makers, market players and technical experts. The team also drew a stakeholder map (shown in Figure 22) positioning stakeholders at the Micro (individuals), Meso (service) and Macro (policy) levels.

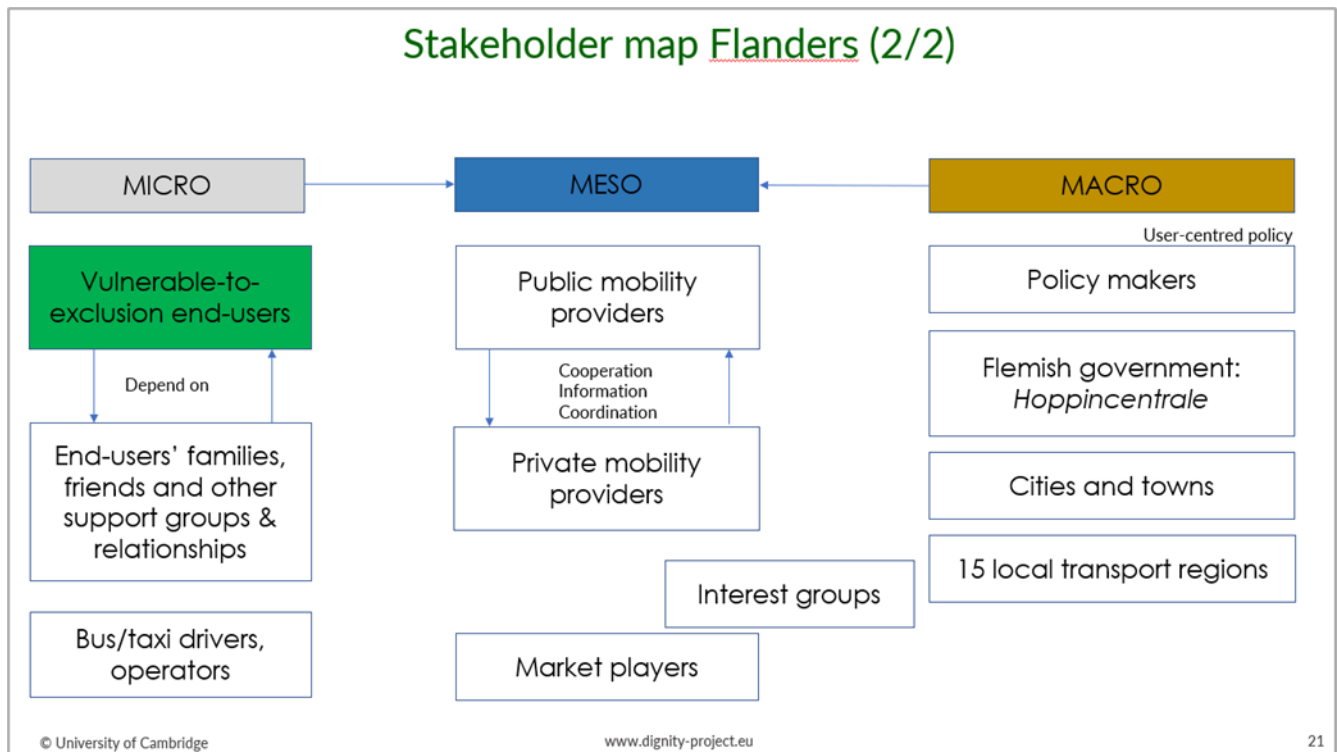


Figure 22: Flanders Explore phase: Stakeholder map

In the *Examine journeys* activity, the pilot team added insights from the interviews conducted as part of the customer journey mapping (Bracke et al, 2021), focusing on the target group of elderly people from rural regions and dial-a-bus users. This included general insights (e.g., about how users found correct travel information) as well as more specific insights about their experience with the current dial-a-bus service. Figure 23 shows some of the key insights about how participants with different levels of digital skills assessed travel information and booked trips.

Under *Examine user data*, the team added some statistics from the DIGNITY Flanders survey on travel limitations, planning an unknown trip using an app or computer, and using digital applications to look up information. They also included some statistics on the particular target group.

In the *Capture needs* section, the team listed needs using the template from UCAM for a variety of stakeholders, including end users, mobility providers, government, policy makers and interest groups. They also considered the needs at various levels: Micro, Meso and Macro.

## Record Sheet: Customer journey highlights and insights

### List highlights and relevant insights from the customer journey mapping

- What became clear is that it is hard to predict digital abilities. One might be reasonably good with a phone, know how to pay by card, be able to read and understand SMS confirmations but also might not have an email address and be completely reliant on others to plan the trip for them.
- In general, participants with low digital skills relied on their network (family, friends, ...) and felt comfortable asking for help. Those participants are likely to be prone to exclusion when their family/friends/... dynamic changes.
- Participants with medium digital abilities were able to book their trips online but preferred calling rather than applying digital solutions because they felt distrust in their abilities to find the right information online and because it saved them a lot of time. This group of participants is most likely to adapt when services will become more digital, making them less vulnerable to exclusion
- Only a limited number of participants could be considered as highly digital skilled in Flanders. These participants were able to book their trip online. They are not likely to be excluded due to digital aspects of their journey, but rather due to physical and financial limitations.

Figure 23: Flanders *Explore* phase: Customer journey highlights and insights, focusing on the target group of elderly people from rural regions and dial-a-bus users

### 4.3.4 Create phase: Co-creation workshop

The pilot team held three in-person co-creation workshops with end users on the 31<sup>st</sup> Jan, 1<sup>st</sup> Feb and 2<sup>nd</sup> Feb 2022 (see Figure 24). The workshops were held in different places (Leuven, Hasselt and Brugge) to make it easier for the target group (older people) to attend.

The workshops lasted 3 hours and had two parts. Part I examined the challenges that users face, and Part II focused on stimulating ideas. 15 people took part in total (12 men and 2 women). All participants were aged 55 or over (3 aged 55-64, 9 aged 65-74, 2 aged 75-84 and 1 aged 85+). 2 people rated their digital capabilities as High, 8 as Medium and 3 as Low.





Figure 24: One of the Flanders co-creation workshops

17 slides of ideas were produced from the co-creation workshops (see examples in Figure 25 and Figure 26). The ideas covered: real-time transport information at transport stops; one point of contact for all mobility providers and all types of public transport; one point of contact for customers' comments and helpline; making micro mobility inclusive and user friendly; uniformity between the 15 transport regions of Flanders; a top-down approach for transport in Flanders; involving end-users (with disabilities) in the decision making process; information in other languages; ideas to do with the app (see Figure 25); the need for a website as well as an app; training for end-users; training for transport personnel (see Figure 26); more flexible use of Hoppin points<sup>16</sup>; bus and train wheelchair ramps; improvements to Mobib card (chip card ticketing) of De Lijn<sup>17</sup>; and tailored solutions for different regions.

<sup>16</sup> Hoppin points are places where users can transfer from one means of transport to another.

<sup>17</sup> De Lijn is a transport company in Flanders

## Workshop material slide: Stimulate ideas

### App

- 1 app for whole Flanders and all mobility providers (NMBS (train), De Lijn (bus in Flanders), MIVB (bus in Brussels) and micro-mobility)
- Connections between mobility providers
- Make it user friendly:
  - Simple language, no English words, no jargon
  - Clear icons (disability)
  - Search functions
- Announce information visually and auditory when needed (speech recognition system that automatically switches to subtitles and vice versa)
- Paper brochure how to use the app (installation and use)

**(only one idea per sheet please!)**



Figure 25: Example idea 1 from co-creation workshops

## Workshop material slide: Stimulate ideas

### Sensibilisation and training for mobility personnel

Public transport employees should attend a course on how to deal with persons with a disability



**(only one idea per sheet please!)**

Print this idea sheet multiple times for use in a workshop for participants to describe or draw their ideas

Figure 26: Example idea 2 from co-creation workshops

### 4.3.5 Create phase: Concepts

The pilot team developed the ideas from the workshops into a set of five concepts:



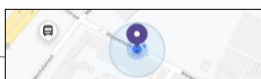


1. Single point of contact for booking your trip and customer helpline in Flanders
2. User-friendly app, easy to navigate
3. Easy web application
4. Training for personnel of public transport
5. Tariff uniformity in Flanders

The team then chose concepts 2 and 4 to explore in more detail. Four slides about each were delivered to UCAM. Examples of the slides are shown below in Figure 27 and Figure 28.

March 2022

**2. User-friendly app (4/4)**

**Points for improvement based on the click version of the app**

1. Find menu in the app 
2. Destination text field 
3. Find a POI (e.g. shop, restaurant, ...) on the map 
4. Type of trip 
5. Adjust departure time/ plan for the future 

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Figure 27: One of the slides giving more detail on Flanders Concept 2: User-friendly app

## Record sheet: Develop concepts

### 4. Train personnel of public transport (1/4)

**Main idea:** Our co-creation workshop participants with disability indicated that they perceived difficulties in the interaction with the personnel of public transport (personnel looked surprised that a person with disability was in front of them and did not know how to interact with them appropriately)

DMOW – in cooperation with Inter - is developing a proposal for a training program on how to interact with people with disability. The proposal is not finalized yet but concrete plans regarding the content of the training program is available (not approved yet). The program will consist of three modules.

- 1) Who is that person with a disability?
- 2) Communicating with the various groups
- 3) Transfers, help or assist?

Flex and Flex+ transport will be specifically designed for people with disability. All drivers must be holders of a certificate on how to interact with people with disabilities and elderly people.

Figure 28: One of the slides giving more detail on Flanders Concept 4: Training personnel

### 4.3.6 Evaluate phase: Highlights

UCAM provided a feedback document to the pilot. This included formative feedback on the five concepts, with more detailed feedback on the more detailed concepts 2 and 4.

Unfortunately, it was not possible for the pilot team to provide UCAM with a link to the beta version of the app nor detailed screenshots. Some information was provided within the design log (see example in Figure 27 above). This included some screenshots and fragments of screenshots, but they were not at sufficient resolution to enable detailed feedback on individual screens. As a result, UCAM's comments related to the app more generally.

For example, UCAM discussed how installing an app in itself is a barrier to many older people. As a result, it may be better to focus on making a user-friendly website, which works on both mobile and desktop/laptop devices.

The feedback from UCAM also included general comments about visual clarity, colour combinations and having a clear graphical style to indicate clickable elements. The screenshots provided to UCAM were too low-resolution for UCAM to assess the visual clarity of the graphical elements in them. However, they suggested that the pilot could use UCAM's Clari-Fi tool (Cambridge Engineering Design Centre, n.d. c) to assess the visual clarity of elements in the app for themselves.

The design log also described some results of user tests on the beta version of the app. These identified various points for improvement, such as making it easier to find the menu in the app

and to adjust the departure time. The testing was conducted with a sample covering the whole adult age range (age 18+). Difficulties with digital interfaces are likely to be greater amongst older people due to the larger numbers in this group with low technology use, attitudes towards technology and digital interface competence (Goodman-Deane et al, 2022).

Formative feedback was also provided on the training for transport personnel (see Figure 28 for an example of the concept description provided by the pilot). Such training would be very valuable because people with disabilities often need additional assistance or specialised information, and it is important that transport personnel can help them with this. The feedback from UCAM suggested other content that could be included in the training to make it even more valuable.

The feedback document also included population exclusion figures for services and tasks that are commonly involved in digital mobility services, including various aspects of the Flanders concepts. The exclusion figures are given in Table 7. These figures can be used to compare different alternatives, to help choose between them and to identify aspects that particularly need improvement.

Table 7: Population exclusion estimates produced for the Flanders pilot. Estimates of the exclusion associated with different kinds of services and tasks that are commonly involved in digital mobility services. The exclusion values are based on the DIGNITY Flanders dataset (n=418 participants).

Service / Task requires ...	Excludes survey participants who ... <sup>18</sup>	Exclusion <sup>19</sup>	N valid <sup>20</sup>
the user to have <b>a mobile phone</b>	do not have access to a mobile phone or any kind (or do not know if they have access to one)	0.6%	418.0
the user to access <b>a website that has been designed to work on both mobile and desktop</b> (This requires availability of Internet)	last used the Internet more than three months ago <sup>21</sup>	5.2%	418.0

<sup>18</sup> The description of which survey participants are excluded refers to variables collected in the survey. Sometimes the ideal variables were not collected in the survey, and proxy variables (that are as close as possible to the demands of the service/task) are used instead.

<sup>19</sup> Exclusion is expressed as a weighted percentage of valid responses to the variable(s) involved in the calculation.

<sup>20</sup> N valid refers to the weighted number of participants who had valid responses to the variable(s) involved in the calculation. As such it varies between rows in the table. The Italian dataset was weighted, so N valid is not always a whole number and is reported to one decimal place.

<sup>21</sup> Data on Internet access was collected but was less reliable than the data on the frequency of internet use. Hence, frequency data was used in the exclusion calculations.

the user to access <b>a website while out and about</b> (This requires availability of Internet on a smartphone)	last used the Internet on a smartphone more than three months ago	9.0%	417.7
the user to access <b>a website on a desktop or laptop computer</b> (i.e., via a website that has been designed for desktop, but has poor experience on mobile) (This requires availability of a computer AND availability of Internet)	last used a computer more than three months ago OR last used the Internet more than three months ago	15.5%	414.2
the use of <b>a smartphone app that needs to be installed on a smartphone and requires an internet connection</b> (This requires app installation AND availability of internet on smartphone)	haven't installed an app in the last year OR last used the Internet on a smartphone more than three months ago	Not available <sup>22</sup>	0.0
<b>confidence planning travel on computer</b>	have low confidence <sup>23</sup> planning an unfamiliar, public transport journey on a (desktop or laptop) computer	21.0%	418.0
<b>confidence planning travel on smart phone</b>	have low confidence <sup>20</sup> planning an unfamiliar, public transport journey on a smartphone	21.9%	418.0
<b>confidence planning travel using a system that is available on both a computer and a smartphone</b>	have low confidence <sup>20</sup> planning travel on a computer AND low confidence planning travel on smartphone	17.4%	418.0
<b>previous experience with a mapping application</b>	have not used a mapping application in the last 12 months	Not available <sup>19</sup>	0.0

<sup>22</sup> These exclusion figures are not available for the Flanders dataset, because the technology activities section was mis-administered in the Flanders survey. Some population information on relevant variables was provided to the pilot from the DIGNITY Netherlands survey instead.

<sup>23</sup> People with low confidence were defined as those rating their confidence between 1 and 3 (inclusive) on the 10-point scale.



<b>good distance-vision ability</b> (e.g., reading fine detail on signage, display boards or TV adverts)	very limited in daily activities due to vision (N.B. This general indicator of vision is not necessarily about distance vision, but it is the only variable in the survey that covers distance vision in any way)	5.2%	416.6
the user to have <b>at least a moderate desire to engage with technology</b>	have a low Affinity for Technology Interaction (ATI) score <sup>24</sup> (i.e., completely or largely disagrees on average <sup>25</sup> with statements that indicate a positive affinity for technology interaction)	50.2%	412.1
the user to be <b>able to recover from errors</b>	completely or largely disagree <sup>22</sup> with the statement "If I tap on the screen or press a button and something happens that wasn't what I expected, I can usually sort it out by myself"	17.8%	416.8
the user to be <b>willing to explore an unfamiliar technology interface</b>	Completely or largely disagree <sup>22</sup> (on average) with statements that indicate willingness to explore an unfamiliar interface	14.8%	416.6

### 4.3.7 Reflections on the IDW process

This pilot highlighted the need for having a person dedicated to and focused on the IDW work. Due to staffing issues, there was a delay in this happening and the pilot was delayed as a result. However, with an enthusiastic and dedicated person who can invest a lot of time in the work, a lot of progress was made in a relatively short time.

The pilot team put a lot of effort into the co-creation workshops and ensuring a good mix of participants with different levels of digital capabilities and ages (within the older age group). This was particularly important due to the target group for this pilot (which was predominantly older people), but it is important on any project.

### 4.3.8 Reflections on the pilot impact

The pilot identified several possible concepts for improving the transport system in Flanders (see Section 4.3.5). They developed two of these in more detail, but the other concepts also have great potential for improving inclusion in the region. In particular, developing an easy-to-use

<sup>24</sup> See <https://ati-scale.org/> for more details on the ATI scale.

<sup>25</sup> Completely or largely disagree corresponds to scores below 3 on a scale from 1 to 6.



website (concept 3) would improve inclusion for those who do not own a smartphone, do not (or cannot) install apps on their smartphone or have low digital interface skills. Creating tariff uniformity in Flanders (concept 5) would also help to increase inclusivity by reducing confusion and providing a simpler interface for users when travelling through multiple areas.

The concepts that are currently being taken further also have great potential. Improving the app (concept 2) helps to make it more inclusive and accessible. Training for transport personnel could also help reduce exclusion by equipping personnel to provide better support for users with disabilities and reduce barriers to their travel.

## 4.4 *Tilburg pilot 1: Older people*

### 4.4.1 Introduction

Tilburg is a city in the Netherlands within the metropolitan area of Brabantstad. There were two pilots in Tilburg, described in this section and the following section (Section 4.5). The first examined issues of travel exclusion for older people and those with disabilities.

The DIGNITY partners for this pilot were Zet and the Municipality of Tilburg. Zet is a consultancy that works on complex societal issues and approaches these from a social perspective.

The individuals involved on the pilot side were:

- Zoe van Otterloo, Marije Baars: Zet
- Inez Rastovac, Marjolein Scheepers, Nicolette van Poppel: Municipality of Tilburg

Digitalisation of transport offers many benefits, but it can also cause exclusion for certain groups, such as older people and those with disabilities. In particular, they can experience difficulties in accessing the transport information that they need and may be reluctant to ask for help.

The goals of the pilot were to:

- To develop an intervention to help digitally excluded people (particularly those who are older) to get from A to B.

### 4.4.2 Overview of the Tilburg older people pilot's IDW process

Table 8 shows a high-level timeline of the IDW activities in the Tilburg older people pilot after the initial training workshop in Feb 2021. These are categorised into the *Manage*, *Explore*, *Create* and *Evaluate* IDW phases. When the table mentions information being added or sections being filled in, it refers to the IDW design log for this pilot.

Table 8: Timeline of activities conducted in the Tilburg older people pilot's IDW

	Key activities			
Month	Manage	Explore	Create	Evaluate
<b>Before July 2021</b>		Other DIGNITY activities, e.g., customer journey mapping	Other DIGNITY activities: Scenario building	
<b>Jul 2021</b>	Initial meetings with UCAM			
<b>Aug 2021</b>				
<b>Sep 2021</b>	Manage sections of design log filled in. Narrowed down the focus of the pilot.	Initial draft of <i>Explore</i> section	Scenarios added to design log. Started preparations for co-creation workshop.	
<b>Oct 2021</b>		Co-creation workshop (included both <i>Explore</i> and <i>Create</i> elements)		
<b>Nov 2021</b>	Updated <i>Manage</i>	Added info from workshop on user needs. Identified some KPIs.	Developed ideas and concepts based on workshop outputs.	Developed ideas of how they could test the non-digital and digital solutions
<b>Dec 2021</b>		Interviews with older people to get more insight		The interviews also gathered some feedback on the initial ideas
<b>Jan 2022</b>	Updated <i>Manage</i>	Narrowed focus based on interview responses	Identified a key concept to focus on. Interviews with stakeholders about this concept. Developed storyboards.	
<b>Feb 2022</b>			Storyboards sent to UCAM	
<b>Mar 2022</b>				Formative feedback from UCAM
<b>Apr 2022</b>				Meetings with stakeholders
<b>May 2022</b>				Final feedback from UCAM.
<b>After May 2022</b>			Set up a working version of the concept. Create an overview of the mobility offer in Tilburg.	Try out the working version.



The main work on the IDW started with a meeting with all Tilburg pilot partners and UCAM on the 13<sup>th</sup> July. At this meeting, the two pilots (this one and the one described in next section, Section 4.5) were presented and it was decided that they would be conducted separately. A follow-up meeting was held on the 21<sup>st</sup> July with the older people pilot partners and UCAM.

Another meeting was held with UCAM in September to clarify some aspects of the design log and how to use it and to discuss co-creation workshops. After this meeting, the pilot team added information to the *Manage* and *Explore* sections of the design log. They also added the scenarios from the DIGNITY scenario building work into the *Create* section of the design log and started planning their co-creation workshop.

The co-creation workshop was held on the 20<sup>th</sup> October 2021 and included elements of *Explore* (understanding user needs) as well as *Create* (producing ideas for addressing those needs). Outputs from this workshop were added to the *Explore* and *Create* sections of the design log.

The pilot team then developed three ideas based on the co-creation workshop outputs. These were then narrowed down to two concepts. The team also developed some ideas for testing the concepts.

In Dec 2021, the pilot team held five additional interviews with older people to get more insights. These insights helped the team to focus the pilot on this need for personal contact, and to identify one particular concept to focus on: a single telephone number for people to call with all their questions about travel options.

In January, the team held online interviews with telephone service providers and a social welfare organisation to develop the concept further. They then developed storyboards describing different routes people might take to get to the point of calling the number for help.

In March, UCAM provided formative feedback on these storyboards. They later added population exclusion figures for various services and tasks that are commonly involved in digital mobility services and in the different options in the storyboards. The final feedback was delivered to the pilot in May 2022.

Providing full details of all the activities is outside of the scope of this report, but some key aspects of each phase are described in the following sections.

#### 4.4.3 Manage phase: Highlights

The pilot team engaged with the *Manage* phase and kept the *Manage* section of the design log updated with key actions as shown in the slide in Figure 29.



## Record sheet: Review progress and agree next steps

**Insert progress made and actions agreed (or minutes of meetings) on this slide and add others as required**

28-9-2021

- We have decided on a focus: reluctance of asking for help
- Date is set for the co-creation session: 20th of October
- Contour de Twern is on board as a partner, and direct link to the target group

20-10-2021

- The co-creation session took place

16-11-2021

- Team meeting to discuss co-creation outcomes and define test focus (for create & evaluate phase)

24-11-2021

- Defined test focus from 2 options: developing an mobility overview for Tilburg, in which we emphasize the need for personal contact for elderly

21-12-2021

- Meeting Kim t-helpt

22-12-2021

- Telephone interviews 5 elderly: testing mobility overviews and discussing the need for personal contact.

13-1-2022

- Overleg Kim klantcontact service

Figure 29: Tilburg older people pilot: Review progress slide

### 4.4.4 Explore phase: Highlights

The pilot team produced a stakeholder list for the 'Stakeholder map' activity. This included a range of stakeholders, such as the municipality, a welfare organisation, the target user group, user representative groups and mobility providers.

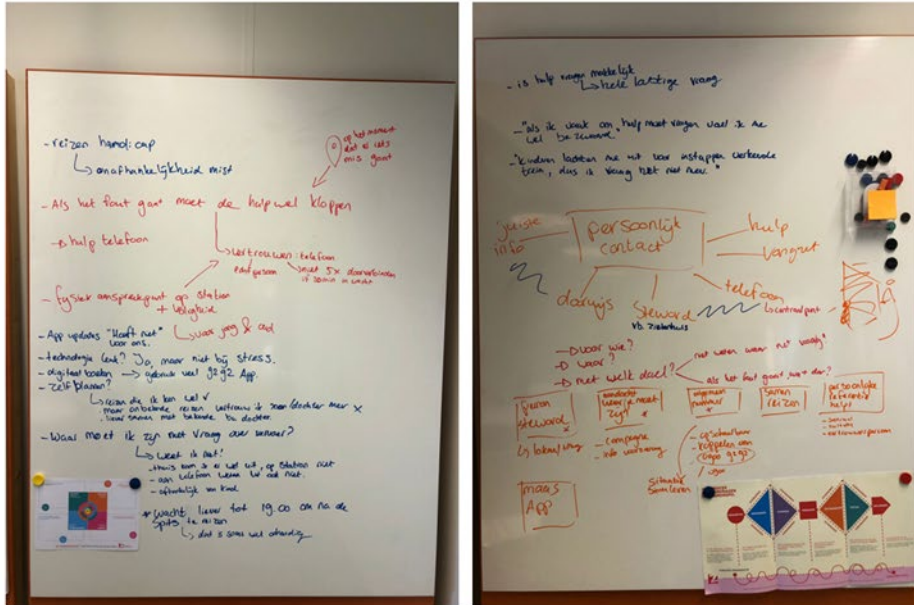
For *Examine journeys*, the team described various insights that arose from the DIGNITY customer journey mapping activity (Bracke et al, 2021). These focused on older people and people with a low-income. They described opportunities and challenges for each of these groups.

Under *Examine user data*, the team included some key statistics about the percentage of the population who are older and who have low digital skills in Tilburg and in the Netherlands more generally. The DIGNITY survey in the Netherlands was not completed until Nov 2021, so they could not draw on this in the early stages of the pilot.

The *Capture needs* section drew on findings from the co-creation workshop about user needs, as shown in Figure 30. Several of the other stakeholders were included in meetings and could share their opinions directly, so the teams did not feel that it was necessary to record their needs in detail in this section.

In *Identify KPIs*, the pilot team identified a range of KPIs, as shown in Figure 31. Some of these related to the design process, focusing on the kinds of people included in the user testing. Others referred to the outcome of the pilot and its effect on the end users.

## Needs



- Personal contact is key
- Not knowing where to go with a question about mobility +
- Not knowing where to find information about mobility
- Not trusting their own information when booking a new trip
- Needing personal help in the heat of the moment, when something goes wrong during travel
- When calling for help, the information needs to be correct (and direct)

Figure 30: Tilburg older people pilot *Explore* phase: Capture needs<sup>26</sup>

## Potential KPIs

- Intervention has been tested with a diverse group of elderly people, i.e.:
  - young elderly
  - Older elderly
  - Elderly with disabilities
  - Elderly with a migration background
  - Different Digital Skills
- Sense of user-friendly travel for the elderly has been increased
- Elderly people know better where to get/find help when they have a mobility/travel related question

Figure 31: Tilburg older people pilot *Explore* phase: Potential KPIs

<sup>26</sup> The text in the photos is in Dutch and is not intended to be legible in this slide. Key points are listed in English next to the photos.



#### 4.4.5 Create phase: Co-creation workshop

The co-creation workshop took place on the 20<sup>th</sup> October and lasted 4.5 hours including lunch. Eight older people participated in the workshop, representing a diverse selection of this age group, as specified in the first part of Figure 31.

The workshop examined the characteristics of the target group of older people, how they travel and their digital skills. It also generated some ideas together with the end users about possible solutions that would help them to continue to travel in their desired ways.

Figure 32 shows an example of the outputs generated from the workshop, examining what the participants need to help them with travel in a world that is becoming more and more digital. The sub-questions included: 'How do you travel at the moment?', 'What issues do you run into?', 'What needs to be improved according to you?' and 'What kind of solutions would help you?'.



Figure 32: Example of an output from the Tilburg older people pilot's co-creation workshop

#### 4.4.6 Create phase: Concepts

The pilot team developed three ideas (shown in Dutch in Figure 33) based on the outputs from the co-creation workshop. The ideas were:

- A platform steward to provide personal contact and help when something goes wrong during a journey
- A general telephone number for all the questions users have about travel
- An information campaign to help users to find the right information

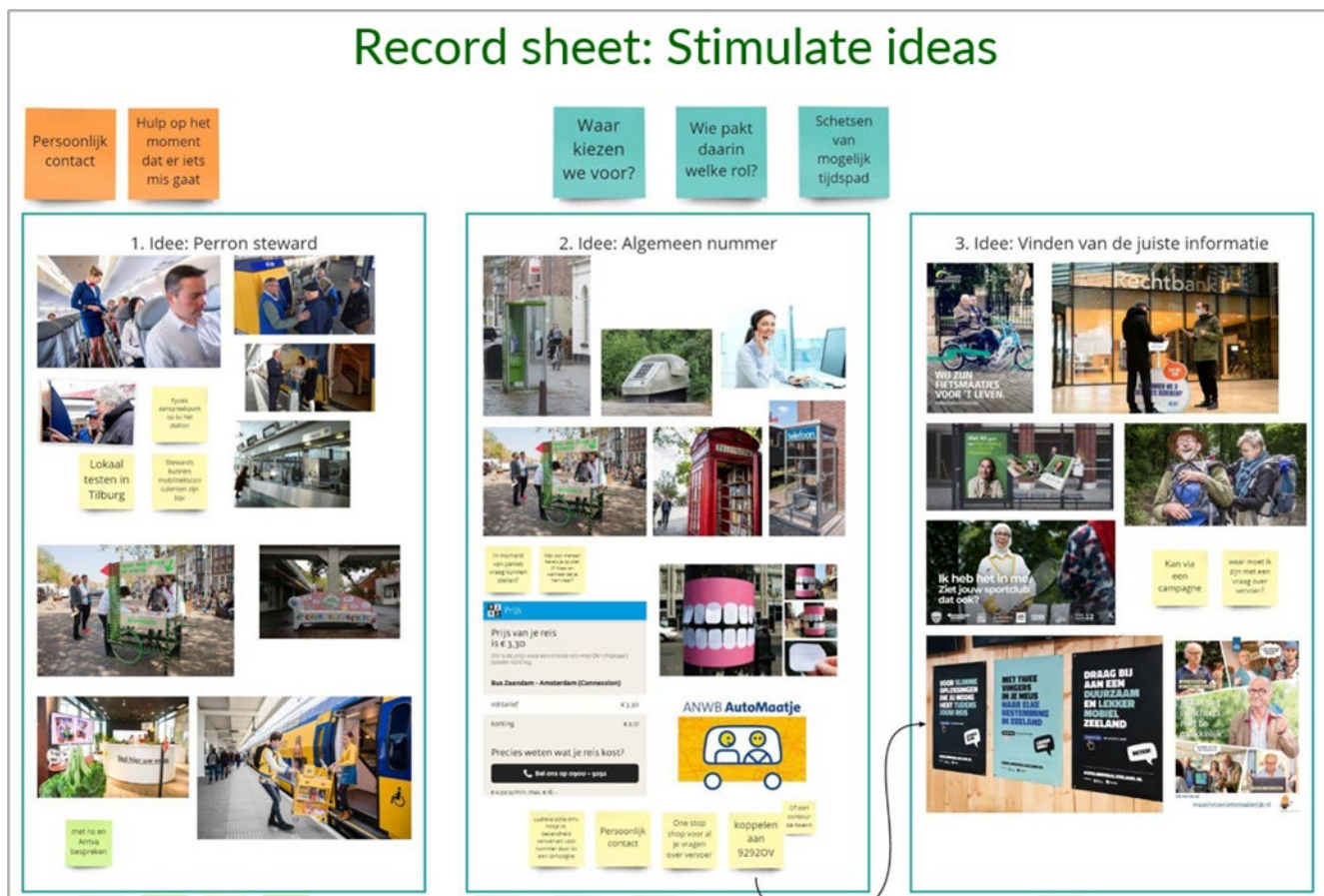


Figure 33: The ideas developed by the Tilburg older people pilot team based on the outputs from their co-creation workshop<sup>27</sup>

The ideas were then narrowed down to two concepts, shown in Dutch in Figure 34. The concepts were:

- Making the existing public transport app more accessible for older people by adding a phone number that they can call for information and assistance
- Creating a physical and digital overview of all the mobility options in Tilburg, adding a personal helpdesk function (this could be a phone number) and linking this to an existing platform in Tilburg

The team then held five additional interviews with older people about these ideas and concepts (see Section 4.4.7 for more detail). The insights gained from these helped the team to identify one particular concept to focus on: a single telephone number for people to call with all their questions about travel options.

<sup>27</sup> The text in this figure is in Dutch. The figure is intended to illustrate the way the pilot team laid out the ideas. The gist of the ideas is described in the main text in this section of the deliverable (Section 4.4.6).



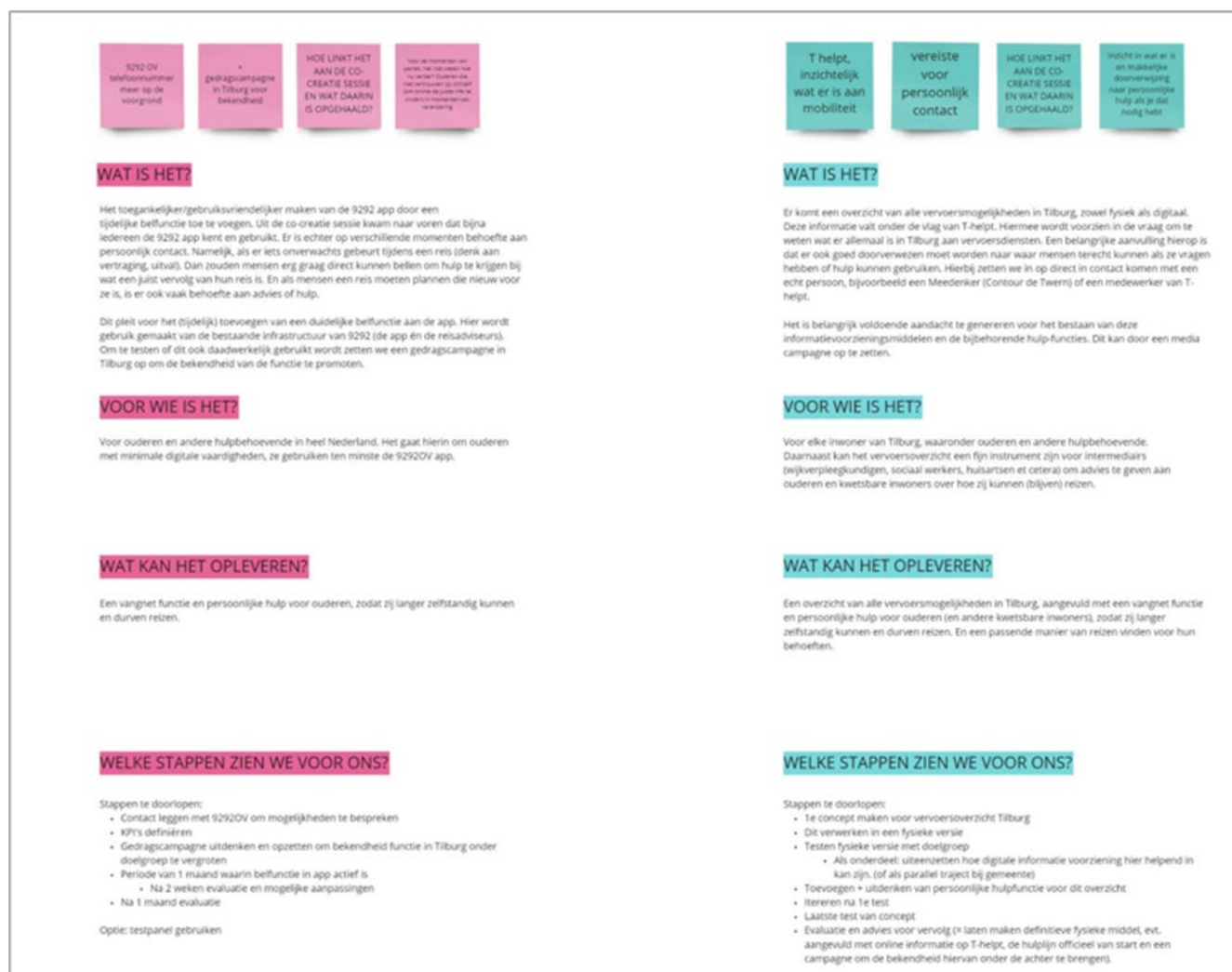


Figure 34: Two concepts developed by the Tilburg older people pilot team<sup>28</sup>

Online interviews were held with telephone service providers and a social welfare organisation to discuss how this service might be implemented in practice. A promising avenue forward would be to work with the social welfare organisation and incorporate travel information into their existing helpline. This could be done by providing the organisation with a decision tree linked to different travel options. The tree could help call centre operators to give each caller a travel option that is best suited for them. The details of the implementation would need to be worked out by the organisation.

The pilot team then developed storyboards describing five different routes through which people might get the phone number for the service and then get to the point of calling the number for help. The storyboard as a whole is shown in Figure 35 and the storyboard for one of the routes is in Figure 36.

<sup>28</sup> The text in the columns is not intended to be legible – it is in Dutch and very small. This figure is intended to show how the pilot team presented their concepts. Summaries of the concepts are given in English in the main text of this section of the deliverable (Section 4.4.6).

The five routes were:

1. Through a caregiver
2. Through finding the folder (about the service) at a community centre
3. Via the local newspaper
4. Via Google
5. Via a campaign

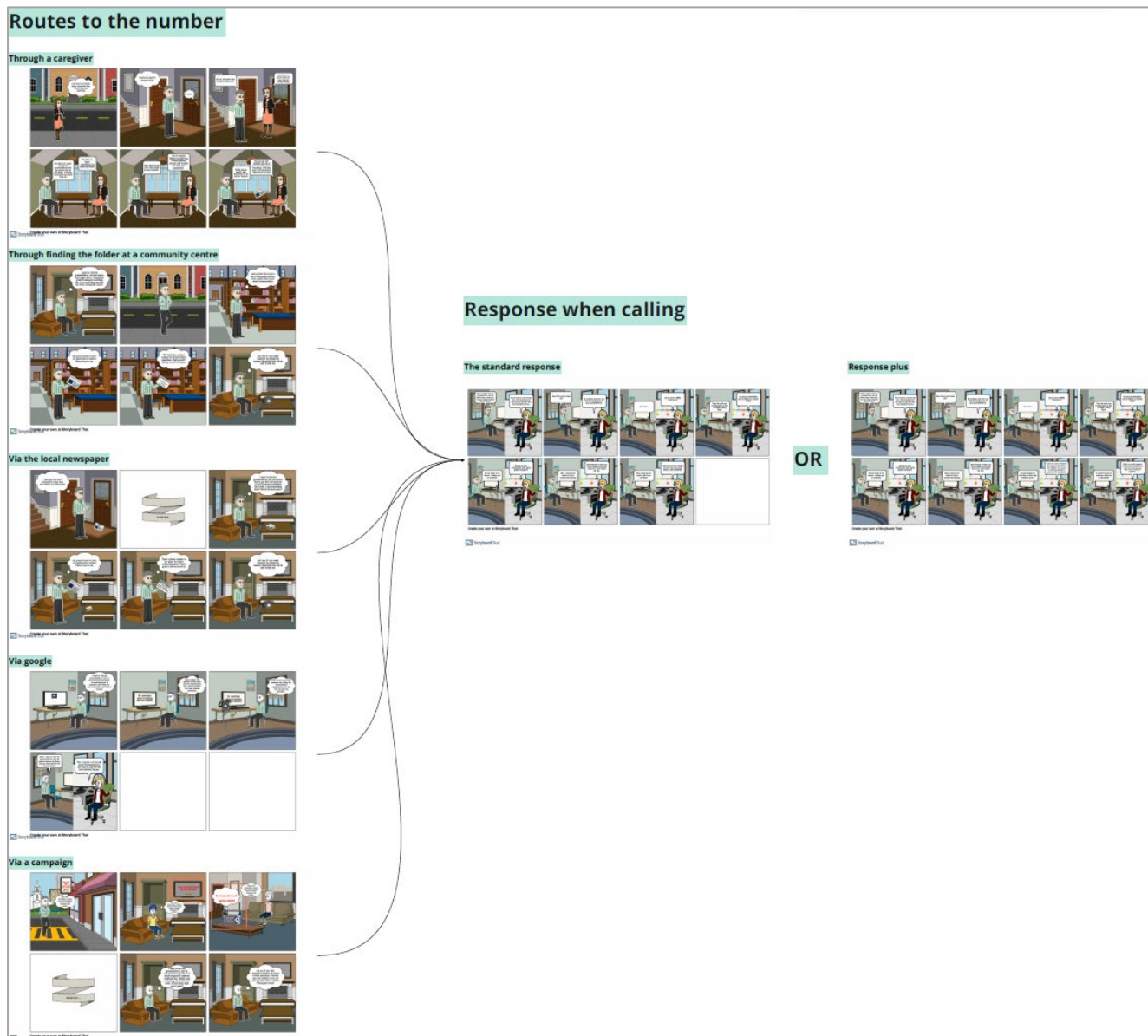
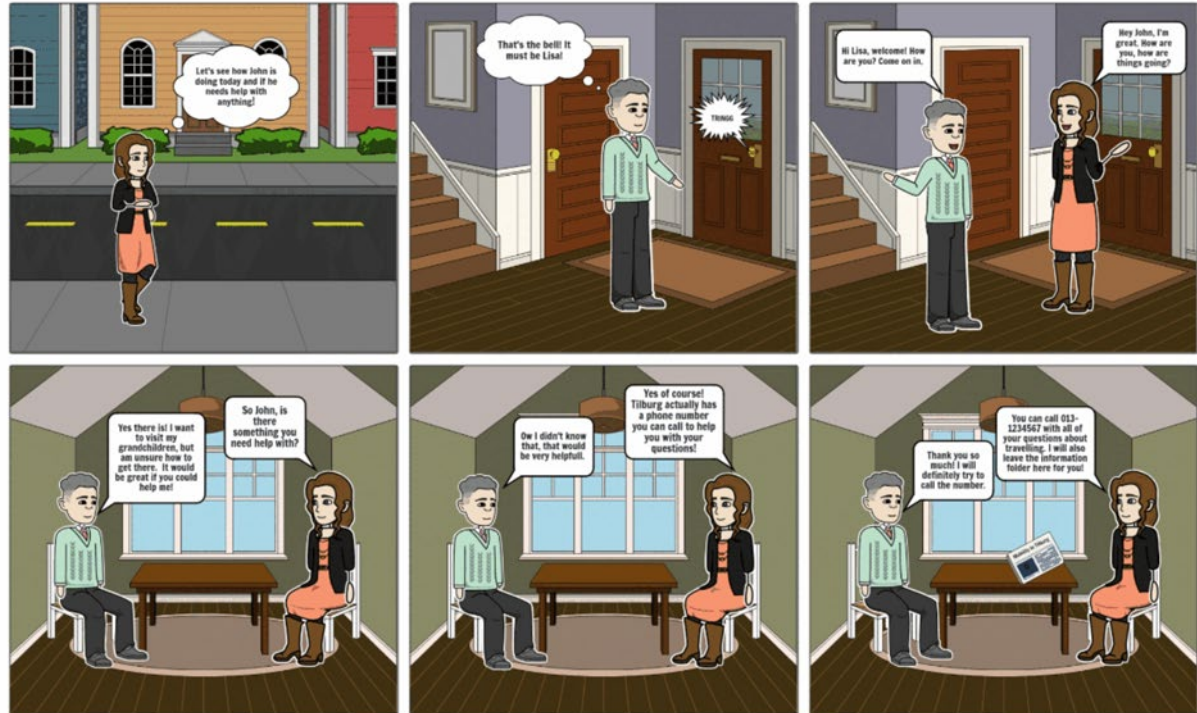


Figure 35: Overall storyboard produced by the Tilburg older people pilot<sup>29</sup>

<sup>29</sup> The text in this figure is very small and is not intended to be legible in this figure. The figure is shown to illustrate the way the storyboards were laid out.

## Through a caregiver



Create your own at Storyboard That

Figure 36: Storyboard for one route for a user to get to the helpline: By being given the helpline number by a caregiver<sup>30</sup>

### 4.4.7 Evaluate phase: Highlights

Five interviews with older people were held in Dec 2021 to get some feedback on the initial ideas and concepts, and to get more insight into the need for personal contact. Each participant received a package with five existing non-digital information tools about travel options (see Figure 37) and three website links. During the interview, the interviewer discussed these materials with the participant and also asked in-depth questions about their need for personal contact when looking for travel information and during a journey.

The insights gained from these interviews helped the team to focus the pilot on this need for personal contact, and to identify one particular concept to focus on: a single telephone number for people to call with all their questions about travel options.

<sup>30</sup> The text in this figure is very small and is not intended to be legible in this figure. The figure is shown to illustrate how the process of a person finding out about the helpline was described using a storyboard.



Figure 37: Existing travel information tools that were used as prompts in the interviews

After the storyboards were delivered to UCAM, UCAM provided feedback on these to the pilot. This included formative feedback on the five routes, how they could be improved and practical advice on implementing them in practice. For example, for route 2 (finding a folder about the service at a community centre), UCAM explained that an older person may not think to look through the library at a community centre and that they might find it difficult to find the helpline number amongst all the library materials. They advised that many older people would be more likely to ask a member of staff at the centre for help. In that case, it would be important to consider how the members of staff would find out about the service and access information about it. A poster at the community centre might also be helpful in making users aware that this service exists, and a 'takeaway' card, flyer or leaflet with the phone number on it would make it easier to pass the information on to the user in a form that is easy to refer to later.

The feedback document also included some population exclusion figures. There was an issue with the figures produced using the DIGNITY Netherlands survey due to a skew in the data for those aged over 65 in this survey. As a result, the population exclusion figures were provided using data from the DIGNITY German dataset instead. The German dataset was chosen because it was the largest of the DIGNITY dataset (n=1010) and used the ADM face-to-face sampling system (<https://www.adm-ev.de/>) which is a reliable system for obtaining a population-representative sample.

Since the concepts developed in the pilot were primarily non-digital, a full table of figures (like those in Sections 4.1.7, 4.2.7 and 4.3.6) was not provided. Instead, some specific results of



relevance to this pilot were included, as shown below. These figures can be used to compare different alternatives, to help choose between them and to identify aspects that particularly need improvement. The figures are given as weighted percentages of those aged 65 and over in the German dataset (n=255) with the percentage of the whole sample (n=1010) in brackets afterwards.

- **39.8%** (11.3%) haven't used the Internet in the last three months
- **82.5%** (58.7%) haven't used a mapping application in the last 12 months
- **49.2%** (21.1%) are somewhat limited in their daily activities due to hearing, and an additional **12.1%** (3.4%) are very limited
- **33.4%** (18.9%) are somewhat limited in their daily activities due to memory and concentration, and an additional **7.2%** (2.3%) are very limited

Some initial estimates of the exclusion associated with the different routes to accessing the helpline:

- The main people who would benefit from Route 4 (the travel information website) would be people who have used the internet recently (in the last three months) but haven't used a mapping application. This is **42.7%** (47.4%) of sample. The vision and digital competence demands of the website would need to be assessed once it actually exists.
- The main people who could benefit from a telephone helpline number would be people that haven't used a mapping application (and may or may not use the internet) and are not very limited due to hearing. This is **71.4%** (55.7%) of sample (note that people with very limited hearing may still be able to use the telephone via speech to text services, but this is likely to be unwieldy for complex information).
- The main people who would benefit from a phone number that is very easy to remember would be people that haven't used a mapping application, are not very limited due to hearing, and are not very limited due to memory and concentration. This is **68.3%** (54.5%) of the sample.
- If the number is not quite so easy to remember, then the opportunity is limited to people who haven't used a mapping application, are not very limited due to hearing and are not at all limited due to memory. This is **43.5%** (42.3%) of the sample.

The pilot team thought that the initial formative feedback was really helpful. They decided to wait until they received the final feedback (in May 2022) before acting on it.

#### 4.4.8 Reflections on the IDW process

Although this pilot used the IDW design log, they found that it was not really flexible enough to reflect their workflow where they moved back and forth between activities. They used Miro by preference and then copied things into the design log for UCAM.

This type of workflow is encouraged in the IDW. Micro as well as macro iterations between phases and activities can help to build a better understanding of needs, develop better solutions, and provide stronger evidence as described in Section 2.3.1. The feedback about the way in which the design log was used is valuable to the team at UCAM in helping us to develop a new version of the log that supports project teams better.

#### 4.4.9 Reflections on the pilot impact

This pilot developed a concept for a telephone helpline to help older people to get transport information and help when they need it. Providing this information via telephone includes many people who are digitally excluded. This is particularly important for this pilot because its target group is older people, of whom large numbers are digitally excluded or have low digital literacy. It also helps to meet the need expressed by many older people for personal contact when they need help with travel. The pilot team is in discussion with the local social welfare organisation about implementing this service in practice.

The pilot also developed ideas for routes through which people become aware of the service and then get to the point of phoning the helpline. This part of the service is vitally important for its success, so we welcome the fact that the pilot team is thinking it through thoroughly. The feedback from UCAM can help to improve some of the routes to make them more inclusive and easier for older people to use.

### 4.5 Tilburg pilot 2: Bike sharing

#### 4.5.1 Introduction

The second of the Tilburg pilots examined bike sharing in the Tilburg region of the Netherlands, with special attention to the needs of migrant women.

The DIGNITY partners for this pilot were NextBike, Mobycon and the Municipality of Tilburg. NextBike is a company that develops and operates public bike sharing schemes in several countries, including the Netherlands. Mobycon is an independent research and consulting company with expertise in transport and mobility.

The individuals involved on the pilot side were:

- Jhon Alexander Ramirez Ospina, Dulce Lozada: NextBike
- Brett Petzer, Angela van der Kloof: Mobycon
- Inez Rastovac, Marjolein Scheepers: Municipality of Tilburg

Goals:

- To develop a concept for a socially and digitally inclusive bike-share scheme (with special attention to migrant women) for the Tilburg region

#### 4.5.2 Overview of the Tilburg bike sharing pilot's IDW process

Table 9 shows a high-level timeline of the IDW activities in the Tilburg bike sharing pilot after the initial training workshop in Feb 2021. These are categorised into the *Manage*, *Explore*, *Create* and *Evaluate* IDW phases. When the table mentions information being added or sections being filled in, it refers to the IDW design log for this pilot.

Table 9: Timeline of activities conducted in the Tilburg bike sharing pilot's IDW

Month	Key activities			
	Manage	Explore	Create	Evaluate
<b>Before July 2021</b>		Other DIGNITY activities, e.g., customer journey mapping	Other DIGNITY activities: Scenario building	
<b>Jul 2021</b>	Initial meetings with UCAM	Planning for co-creation workshop (included both <i>Explore</i> and <i>Create</i> elements)		
<b>Aug 2021</b>				
<b>Sep 2021</b>	Information added to <i>Manage</i> section	Co-creation workshop (Workshop 1) and reflection on workshop findings		Workshop 1 included feedback from participants on current bikes and bikes sharing schemes
		Information added to <i>Explore</i> section	Identified further ideas and extensions of workshop findings	
<b>Oct 2021</b>		User data from Workshop 1 added to <i>Explore</i> section	Workshop 2 (with other stakeholders, not end users)	
<b>Nov 2021</b>			Developed concepts and guidelines for a more inclusive bike sharing scheme	
<b>Dec 2021</b>				
<b>Jan 2022</b>				
<b>Feb 2022</b>				
<b>Mar 2022</b>		Information added to <i>Explore</i> section	Information added to <i>Create</i> section	
<b>Apr 2022</b>			More detail on the concepts delivered to UCAM	
<b>May 2022</b>				
<b>After May 2022</b>				UCAM to provide feedback on concepts

The main work on the IDW started with a meeting with all Tilburg pilot partners and UCAM on the 13<sup>th</sup> July. At this meeting, the two pilots (this one and the one described in the previous section, Section 4.4) were presented and it was decided that they would be conducted separately. A follow-up meeting was held on the 26<sup>th</sup> July with the bike sharing pilot partners and UCAM.



Following this meeting, the pilot team worked on planning their co-creation workshop, which included elements of *Explore* (understanding user needs) as well as *Create* (producing ideas for addressing those needs). They then met again with UCAM on the 13<sup>th</sup> Sep to review the workshop plans and completion of the design log.

The co-creation workshop with end users (referred to as Workshop 1 in this pilot) was held in person on the 27<sup>th</sup> Sep. Following this, the team reflected on the workshop findings and added information into the design log. They also identified some further ideas and extensions of the workshop findings.

A second workshop (Workshop 2) was held online in Oct 2022 with a range of other stakeholders (not end users). This workshop reviewed the findings so far, discussed some of the issues, identified some further ideas and produced a set of action points to take things further.

Based on the work so far, the pilot team identified important findings regarding the development of a bike-sharing scheme that is more inclusive for at-risk groups. These findings helped in the production of guidelines and a high-level concept for such a scheme.

The concepts and guidance were not delivered to UCAM until April 2022 which was after the deadline for UCAM to provide feedback within this deliverable. UCAM have agreed to provide some informal feedback after this deliverable is finished.

Providing full details of all the activities is outside of the scope of this report, but some key aspects of each phase are described in the following sections.

### 4.5.3 Manage phase: Highlights

The pilot team filled in the *Manage* section of the design log early in the pilot. After this, they produced Word documents with details of the two workshops and a report on the pilot as a whole.

### 4.5.4 Explore phase: Highlights

The pilot team produced a stakeholder map using the template provided by UCAM (see Figure 38). The map included a wide range of stakeholders including different kinds of end users, other community members, service providers and government authorities. The team also identified specific organisations and individuals to involve in the pilot, particularly in Workshop 2.

The customer journey mapping activity for Tilburg focused on bus journeys (see Bracke et al, 2021). As a result, it was not very relevant for the bike sharing pilot. Instead, in the 'Examine journeys' section of the design log, the pilot team described some of the barriers to the use of bike sharing schemes and some possibilities for a public bicycle fleet.

Under *Examine user data*, the team included some information about women with a migration background in the Netherlands. The DIGNITY survey in the Netherlands was not completed until Nov 2021, so they could not draw on this in the early stages of the pilot.

## Stakeholder map Tilburg

### Low Interest and High Influence (satisfy)

\* Other members of the community from which participants are drawn and in which they live – in the past, attitudes towards cycling in this community have formed a barrier to the participants' ability to access lessons

### High Interest and High Influence (manage)

- The City of Tilburg
- Other authorities with some responsibility for cycling (infrastructure, etc.), such as the Province of Noord-Brabant.
- Existing and potential providers of mobility services (e.g. Nextbike, Hopper)

### Low Interest and Low Influence (monitor)

\* Other residents of Tilburg – attitudes and behaviour towards novice cyclists belonging to visible minority groups

### High Interest and Low Influence (inform)

- Participants: women learning to cycle
- Participants: other women at risk of exclusion from mobility services
- Social workers and other professionals working within these communities and liaising between them and other actors to address mobility poverty, etc.

Figure 38: Tilburg bike sharing *Explore* phase: Stakeholder map

In *Capture needs*, the pilot team focused on the needs of different types of users within their target user group, as shown in Figure 39. To record the needs, the team used the template provided by UCAM for this activity within the design log.

The pilot team considered some possible KPIs in the *Identify KPIs* activity. However, in the end, they decided not to define any KPIs because the goals of the pilot were qualitative.

## Template: Tilburg Migrant Women

As a...	I need..	So that...
Woman with a migration background	Access to a reliable, well-maintained bicycle at an affordable price that is close to where I live	I can cycle with confidence in mixed traffic, with my children, in a way that meets my practical needs
Woman learning to cycle	A range of different bicycles	I can continue to cycle safely as my skills develop/as my physical needs change over time
Woman with difficulty accessing (smartphone-based) mobility services	A diversity of means of access to these services, including non-smartphone-based alternatives	I can reliably access these services as circumstances change (loss of a smartphone, shared use of a smartphone within a family, possession of older phones that are not compatible with online platforms, lack of a smartphone).

Figure 39: Tilburg bike sharing Explore phase: Capture needs

### 4.5.5 Create phase: Co-creation workshop

On the 27<sup>th</sup> Sep 2021, the bike sharing pilot held a co-creation workshop with users (often referred to as Workshop 1 in this pilot). The workshop was held in person and lasted 3 hours. An incentive of a € 30 voucher from Decathlon was offered to participants. 20 participants attended (19 female and 1 male). The gender imbalance was due to the target user group for this pilot, which was migrant women. The workshop was held in Dutch, with the assistance of interpreters for Arabic and Tigrinya (as some participants had limited levels of Dutch language ability).

The workshop involved discussion of how participants currently experience cycling and issues that they experience with cycling. Participants also suggested ideas for how to respond to some of these challenges. A selection of bicycles was available at the workshop for participants to try out and comment on. These included bicycles used in existing bike sharing schemes ov-fiets and Hopper. Some of the participants also downloaded and tried out the Hopper app using a log-in code specially provided by Hopper.

Some of the notes from the workshop are shown in Figure 40. The participants indicated that cycling was highly appealing to them in comparison to public transport but that there were challenges. Key challenges for cycling in general were: (1) the lack of a bicycle, (2) the lack of an appropriate bicycle in good working order for reliable everyday use, (3) the lack of access to a non-standard bicycle, such as a cargo bike, for occasional use, and (4) the relationship between the local cycling context and infrastructure and the participants' own skill and comfort level. Further challenges with the existing bike sharing schemes focused on

cost and the requirement to have a credit card, Dutch-issued debit card and/or a smartphone with data credit.

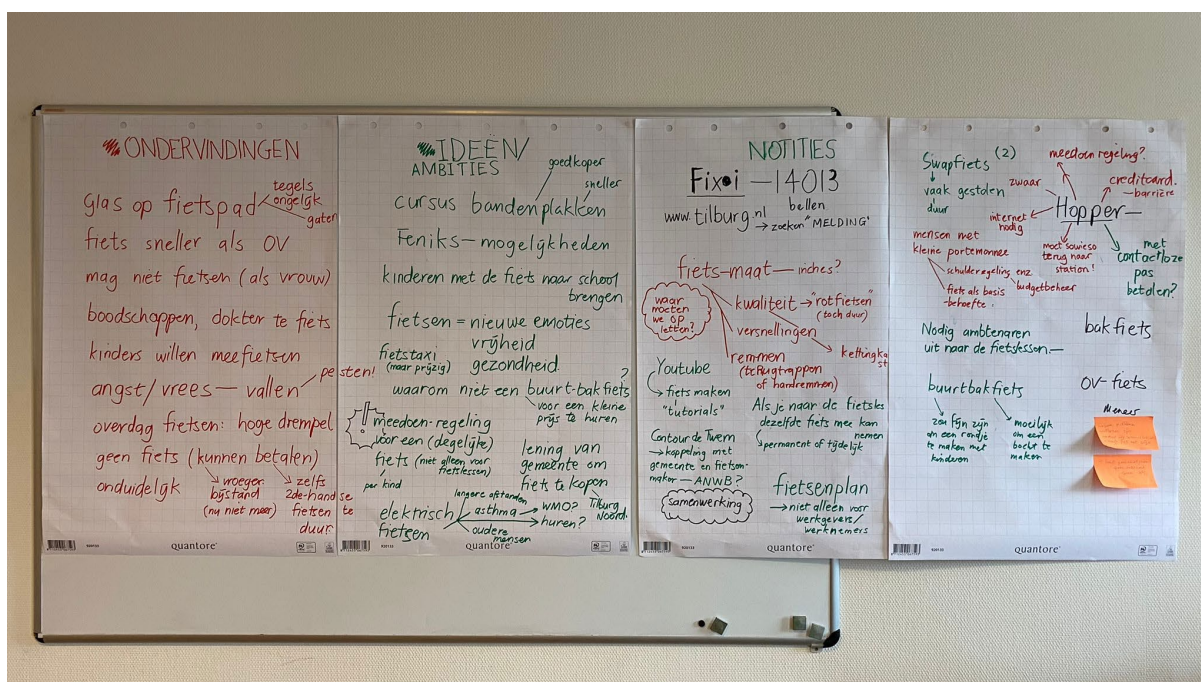


Figure 40: Notes from Tilburg bike sharing's co-creation workshop (Workshop 1)

The participants came up with various ideas about how to respond to the challenges. Some further ideas emerged from discussions among participants following the workshop. The ideas included: learning and teaching practical skills, neighbourhood-based shared cargo bikes, innovative ways of paying for private bicycles, long-term bicycle rental and earning credits towards a bicycle.

The pilot team then reflected on the findings from Workshop 1 and identified further ideas and extensions of the workshop findings. A further workshop (Workshop 2) was held online on the 12<sup>th</sup> Oct 2021 with various stakeholders who were not end users. This workshop reviewed the findings so far, discussed some of the issues, identified some further ideas and produced a set of practical action points to take things further.

#### 4.5.6 Create phase: Concepts

The pilot team then developed some concepts and guidelines for bike sharing schemes. Some of these focused on understanding the stakeholders and their needs. These included:

- Personas of the selected target groups of users
- Discussion of the involvement of public authorities and the choice of bike share operators
- Profiles (pains, gains and customer jobs) for three groups of stakeholders: potential bike-sharing users, public authorities and bike share operators.

The team also produced a high-level description of a concept for a new service. This included:

- A list of all the services that a bike share provider could offer as part of a modular mobility solution package (see Figure 41). The public authorities could adapt this set based on their current needs.
- A short explanation of each of these modular services, e.g., a list of the features that would need to be included in a user app.

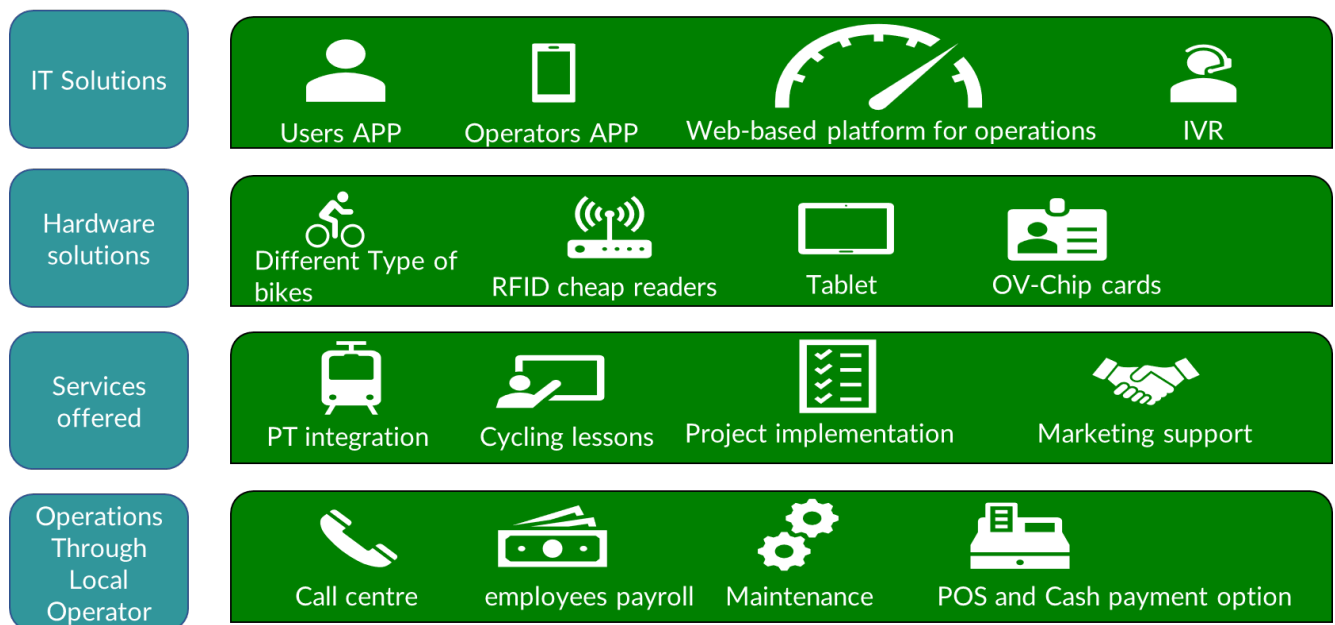


Figure 41: Services that a bike share provider could offer (figure taken from a report by the Tilburg bike sharing pilot team)

Lastly, the team also gave some recommendations for an equitable future shared cycling system in Tilburg. These examined:

- Issues to do with cycling competency in addition to interacting digitally with a shared cycling platform or service
- Social and financial issues, focusing on the use of smartcards, integration with social benefit and government payment schemes, and subsidising of bicycles
- The types of bikes and bike accessories (such as child seats) that should be provided in such a system



#### 4.5.7 *Evaluate phase: Highlights*

The pilot delivered the concepts to UCAM too late for feedback to be included in this deliverable. UCAM have agreed to provide some informal feedback after this deliverable is finished.

#### 4.5.8 Reflections on the IDW process

The co-creation workshop seemed to go very well and was a key part of the pilot. The pilot team also ran a follow-up workshop with stakeholders which was valuable for moving forward with the ideas and considering how they could be put into practice.

The team used the design log to record short summaries of their work so far. They first wrote more detailed Word documents describing the workshops or work so far. Some (but not all) of the key points from these documents were then transferred into the design log. This observation of how the design log was used will be considered by the UCAM team in developing a new version of the log that supports project teams better.

#### 4.5.9 Reflections on the pilot impact

The overall concept of a modular bike sharing scheme could be useful for public authorities in creating a scheme that meets the needs of a particular area or target user group. The concept needs to be developed further, with additional modules and more detailed consideration of how the individual modules can be designed to increase inclusion. For example, the scheme includes a user app as the main user touchpoint to the scheme. However, the pilot's recommendations point out that many of those in the target group may not have smartphones, and that an alternative (such as smartcards) would be a more inclusive touchpoint. This needs to be incorporated into the concept.

The set of recommendations provided by the pilot could also be useful for public authorities in considering how to increase inclusion. For example, the recommendation to provide cycling lessons can help to overcome cultural and social barriers to participation in bike sharing. Similarly, the recommendation to use a smartcard as the interface with the scheme rather than a smartphone app could help to increase inclusion among those who are digitally excluded (e.g., who do not own a smartphone or have low digital interface competence).

## 5. Insights and lessons learnt

This section contains some initial lessons learnt from the IDW pilot work. It reflects on the experiences of the UCAM team as they supported the pilots through this work and on the feedback from the pilot teams during the process. More thorough evaluation of the IDW process and pilot experiences is currently in progress and is due to be published in DIGNITY Deliverable D4.2.



The DIGNITY IDW process contains four phases and twenty activities. Inevitably, there is a significant amount of explanation and knowledge transfer required for the pilots to be able to conduct it adequately. DIGNITY Deliverable D2.2 (Bradley and Goodman-Deane, 2021) was developed to provide the detailed support documentation for the process. The teams were also given the IDW design log. This provided a structured format for recording progress on the IDW along with limited guidance for each phase and activity. The teams were also supported throughout the process by UCAM through bilateral meetings and e-mail correspondence.

The following are some of the initial insights and lessons learnt from this process:

- 1) Having the detailed IDW guidance in a separate document (deliverable D2.2) rather than in the design log itself meant that teams had to take more time and effort to find the document and then navigate to the specific piece of additional information they needed. Hyperlinking to specific parts of D2.2 from the relevant parts of the design log may help.
- 2) The IDW is inherently iterative, but the nature of the design log in a PowerPoint file was more linear. Consequently, it was hard for the teams to reflect both large and micro iterations within the design log format. Some teams positioned a text box or symbol incorporating the date next to updated information to provide some clarity. However, a system which incorporates the date of updates automatically might be more user-friendly for the pilot teams. It could also make it easier for the reader to understand the order of steps in the work. The UCAM team are also considering other ways of recording both large and micro iterations better. This may involve changes to the design log or moving to a different way of recording IDW work.
- 3) Provision of personal support for the IDW process seemed to be very valuable to the teams to clarify, encourage, and guide them. It is important to consider whether and how this support could be provided for projects in the future.
- 4) Some teams seemed unclear about which activities were optional and which were essential parts of the IDW process. This could be made clearer in the IDW design log and in supporting documentation. It may also help to have a more explicit process with the pilot team at the start of IDW work to identify what information they already have (possibly in a different form from that specified in the IDW) and what is missing. The missing information could then be discussed as to its relative importance and relevance to the particular work, given its timing, topic and constraints.
- 5) In all pilots, some explanation and clarification were needed from the UCAM team to clarify the purpose of and explain how to do certain activities. This was particularly common for the *Develop Case* and *Identify potential KPIs* activities. In some cases, there was an initial reluctance to carry out or record an activity. The UCAM team needed to explain the purpose of the activity, persuade the team that it would be useful for them and encourage them to do it. This suggests that better explanation is needed of why the activities are useful and how they relate to different types of projects.
- 6) There was generally lower recording of the *Manage* phase activities in the IDW design log. It may be that some teams did not really consider the *Manage* activities to be part of the IDW process but thought of them as part of the conventional (and presumably





normal) business of project management in general. The UCAM team will consider how to better handle the *Manage* activities within the IDW process.

- 7) Some pilot teams had difficulties with the *Identify potential KPIs* (Key Performance Indicators) activity in the *Explore* phase. In some cases, this was because the goals of the pilot were more qualitative (see example in Section 4.5.4). Nevertheless, the lack of KPIs affects the ability to carry out some of the *Evaluate* activities. Further work is needed to consider how to adapt the *Identify potential KPIs* activity to be more useful to a wider variety of projects, perhaps broadening KPIs to a wider range of evaluation criteria.
- 8) The output from the scenario building activities led by IZT was fed into the IDW in the *Examine scenarios* activity within the *Create* phase. It was located there to encourage teams to use the scenarios to inspire ideas and to provide a vision of potential futures in which the design solutions would need to operate. However, in practice, that the scenarios were more closely aligned with the *Explore* activities in the IDW. The UCAM team will consider the best place for this activity within the IDW.
- 9) The pilot team-led co-creation workshops all included elements of both *Explore* and *Create*. Although this is a typical experience with workshops of this type, the nature of the IDW log made it hard to capture the output neatly in one place. The UCAM team will consider how the design log can be improved to support this better.

## 6. Conclusions and further work

This deliverable has reported on the work of five DIGNITY pilot teams (from four countries) applying the Inclusive Design Wheel (IDW) process in practice. All the teams engaged well with the IDW process and design log. During meetings with UCAM, they indicated informally that they found the IDW helpful in developing more inclusive mobility services. Further, more formal evaluation of the IDW process will be recorded in DIGNITY Deliverable D4.2: Pilot cases evaluation report.

All the pilots produced concepts and recommendations which offer the potential to reduce exclusion for their local transport systems. These included usability and accessibility improvements of existing services, as well as concepts for new ways of accessing services and travel information which are more inclusive than the current provision. Other concepts developed by the pilots could improve inclusivity for low-income groups, older people and other vulnerable-to-exclusion groups, for example through accessibility awareness training for staff and alternative modes of payment and service provision.

The experience of running the pilots has provided a lot of useful feedback on the IDW. UCAM are currently considering improvements to both the IDW process and the mechanism for logging the progress on the IDW, taking into consideration the lessons learnt. The improved version will be available in the final version of the Dignity toolkit.



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