Deliverable
D2.3 Challenges, user requirements and solutions CO-C

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List of Abbreviations

Abbreviation	Explanation
CC	Co-Creation(workshop)
EU	European Union
TX.X	Tasks in the URBANAGE project
WHO	World Health Organization
WP	Work package in the URBANAGE project
OA	Older Adult
CS	Civil Servant
GIS	Geographic information system
PMV	Personal Mobility Vehicles

1 Executive Summary

The URBANAGE project aims to assess the potential benefits, risks, and impact of using disruptive technologies for evidence-based decision-making in the field of urban planning for age-friendly cities. To this end, a framework for data-driven policy making is to be developed through an inclusive co-creation strategy with relevant end users (public servants and older adults). Task 2.3, **Co-creation for challenges, user requirements and solutions identification**, of which this document is the deliverable, contributes to these goals by identifying the challenges, requirements, and solutions for the URBANAGE ecosystem from the users' perspective through a co-creation process. For this, nine different workshops were organized with public servants and older adults and other relevant stakeholders identified in T2.1. The workshops are grounded in the user engagement strategy, as designed in T2.2.

The methodology of this deliverable entails **three waves of co-creation sessions**, which took place in the three pilot sites of the project (Helsinki, Flanders & Santander). The first wave identified citizens' needs for an age-friendly city, the second wave explored the perspective of the policymakers related to those needs, and the third wave focussed on the development of a prioritized list of user requirements from a combined citizen-policymaker perspective. The disentanglement of the three pilot sites allowed for local adaptations and an investigation of mutual and divergent needs. The organisation of these events was challenged by rapidly changing COVID19 restrictions and regulations, which forced the project to adapt. This implied that some events were organized online (or outdoors) and sometimes with fewer respondents than initially foreseen. However, the overall planning and insights were not affected.

The co-creation activities revealed the importance of public infrastructure as a defining aspect of age-friendly cities (e.g., trees, benches, water fountains), but also the general accessibility and walkability (and walkability barriers such as snow, thrash, etc.), adequate street signage, proximity of facilities, proper and autonomously usable public transport, cleanliness and safety. Regarding digital participation in addressing such issues, older citizens are rather open to innovative solutions (such as participatory sensing or apps), but expect closed and fast feedback loops and a clear single point of contact. Also, traditional communication channels (e.g., television) should be deployed in parallel. Regarding regional differences, this research found that most insights are similar for each pilot site. However, weather and topological conditions pose different expressions of the challenges (e.g., snow in Helsinki, staircases in Santander). The needs of civil servants are very similar, and several interesting initiatives already exist to tackle these challenges. Civil servants confirm the need for adequate public infrastructure, but also highlight the difficulty to monitor this (e.g., malfunctions). Specifically, regarding older citizens, civil servants are searching for new ways to communicate with this (often hard to reach) part of the population. However, the data to support these initiatives is often lacking, not linked or not accessible. Finally, in the local administration and policymaking, there is a gap between data literacy and domain specific knowledge.

These insights were transformed into requirements and then prioritized, which should improve the long-term relevance of the URBANAGE project. More specifically, by including both older citizens (which often

feel unheard in such decision-making processes, cfr. D2.2) and policymakers in this process, the development of the URBANAGE platform should align with real needs of both urban stakeholder groups. When taking this input into account, the project could support urban initiatives that improve the age-friendliness of a city that allows older citizens to live a more qualitative and independent life. Hence, the requirements that can be found in this document feed into the development of WP3 (Data & Intelligence), WP4 (URBANAGE Digital Twin), WP5 (Ecosystem & Integration) and WP6 (development of the use cases).

2 Introduction

European cities and policymakers are faced with an increasingly ageing urban population (Ageing Europe Eurostat, 2020), challenging them to adapt their urban planning and policymaking strategies to become more age-friendly i.e., tailored to the needs of an older population. In parallel, emerging smart city technologies generate new and large amounts of data that fuel data-driven policymaking processes. With the "right" analytical digital tools and technologies and with the "right" analytical capabilities, this can be employed to gain better insights into current and future urban patterns and citizen behaviours. Tapping into both trends, the URBANAGE project was conceived with the intent to enhance data-driven decision-making by policy makers in the field of urban planning of age-friendly cities. To this end, the project will develop a sustainable and long-term URBANAGE ecosystem that integrates several disruptive technologies (such as multidimensional big data analysis; modelling and simulation with Artificial Intelligence algorithms; and visualization and interaction through Urban Digital Twins) and synchronizes those with user needs and requirements.

As the URBANAGE project wants to ensure the long-term applicability and relevance of its solutions to both end users (policymakers and older adults), a collaborative and inclusive co-creation strategy aimed at better understanding the end users' needs and requirements is of great importance. Therefore, **WP2 Impact & Acceptance** is dedicated to understanding these users' needs and the validation of the URBANAGE solutions' relevance, impact and value to end users. As such, *WP2 Impact & Acceptance* informs *WP6 Use cases* on the design of use cases tailored to real-life needs and guides *WP5 Ecosystem & Integration* by validating the different iterative implementations of the Ecosystem.

The foundation of this work package was laid in **T2.1 Stakeholder mapping & engagement roadmap**, where AGE and the other project partners identified the necessary stakeholder networks and co-developed a strategy for involving these potential stakeholders throughout the rest of the project. Next, the University of Helsinki (UH) led **T2.5 Legal & Ethical framework** to create a set of guidelines on how to ensure end user participation in an ethical and legal manner and in compliance with all the relevant national and EU level regulations. In **T2.2 Engagement strategy for older adults** and its corresponding deliverable **D2.2 User engagement guidebook and strategy for older adults**, IMEC and the other partners further investigated the most adequate strategies, tools and methodologies for engaging older adults in such data-driven policymaking.

Hence, this task (*T2.3 Co-creation for challenges, user requirements and solutions identification*) and the current deliverable (*D2.3 Challenges, user requirements and solutions*) aim to design and execute a series of co-creation activities in support of the design of URBANAGE's use cases and solutions. The overall goal was to develop requirements and boundary conditions for the development process. To do this, in total, 3 co-creation workshops were organized per pilot location, for a total of 9 workshops. The disentanglement of the task goal into three separate waves allowed to first capture the initial perspectives of both stakeholder groups (first citizens, in CC1; then civil servants, in CC2). This allowed each stakeholder group to provide

input in an unbiassed, non-negotiated way. Next, this 'raw input' was used as a starting point for a negotiation and deliberation process in CC3, in which both older adults and civil servants were involved and had an equal voice. This facilitated the collaborative transformation and prioritizing of the initial input of the first two monoperspective co-creation workshops (this a common strategy to gradually develop a so-called "common language" in design processes). The overview below provides a high-level description of the co-creation process.

Figure 1 Visual representation of co-creation workshops

1. **Co-creation workshop 1: needs, barriers & challenges**
    a. *Target group*: older adults
    b. *Goal*: identify long-term and short-term challenges and needs related to age-friendly cities and the specific pilot use case(s).
    c. *Output*:
        - Longlist of user requirements (older adults) as related to the use cases;
        - Challenges and barriers related to living in an (age-friendly) city (general).

2. **Co-creation workshop 2: needs, barriers & challenges**
    a. *Target group*: civil servants (policymakers)
    b. *Goal*:
        - identify existing initiatives, challenges, collaborations, and key actors,
        - validate the relevance of user requirements identified in CC1, and
        - identify technical constraints & challenges related to the implementation.
    c. *Output*:
        - List of relevant existing collaborations between city departments.
        - List of user and/or functional requirements (from the civil servant perspective);
        - First scan of available data sources linked to relevant URBANAGE indicator´s framework and/or user requirements.

3. **Co-creation workshop 3: solutions & validation**
    a. *Target group:* mix of older adults and civil servants
    b. *Goal*:

- prioritize the different needs of older adults (translated into 'elements' for the purpose of this workshop)
- balance them with what is feasible from the perspective of civil servants.

c. *Output*:
- Prioritization of the user requirements by older adults (MoSCoW method[1])
- First indicative mapping of user requirements to the URBANAGE indicators and available data sources

The overall research regarding the parameters that should be included in the age-friendliness of the urban planning processes in the cities, is based on the analysis of the WHO framework of indicators defined as the Age friendly cities indicators[2]. In order to define the scope of the research, a first selection of urban planning related indicators was made.

After this first analysis, the initial set of 81 WHO indicators were reduced to 37. Next, this was extended with indicators from other frameworks related to healthy and age-friendly cities. After this process, the number of indicators increased to 50. This is the initial URBANAGE indicators' framework that has been used in the co-creation activities.

The methodology and outcomes of these workshops are discussed per co-creation workshop as each workshop applied a different approach. For each workshop, we first discussed the goal and research questions, then the methodology to tackle these, and finally the workshop results and main conclusions. To be able to distinguish the different pilot site angles, we disentangled the results per pilot site, as this allows an easier link with the specific use cases. For completeness, this document contains tables with the extensive results collected during the workshops. The raw tables are best suited to support the work in WP5 and WP6. We conclude this document with some general conclusions and remarks.

[1] The MoSCoW method is a (design) method that facilitates prioritization of requirements and features by labeling them as 'must haves', 'should haves', 'could haves', and 'won't haves'.
[2] The WHO Age-friendly Cities Framework is developed by the WHO to identify, analyze and drive urban well-being of older adults and comprises a set of indicators clustered in eight (interconnected) domains (World Health Organization, 2007).

3 CC1: needs, barriers & challenges (older adults)

Figure 2 CC1 Workshop in Santander with older citizens

Figure 3 CC1 Workshop in Santander, older citizens discussing issues they find in the urban environment

3.1 Goal

The first series of co-creation workshops was aimed at gaining insights in how an age-friendly city looks like for older citizens. Approaching it from the long-term and from the short-term challenges and needs related to age-friendly cities and the specific pilot use cases. Based upon these insights, the final goal of CC1 was to **formulate user requirements** that represent "what older citizens want to be able to do in their cities". These requirements were formulated in the format of "As an older citizen, I want to be able (action) to (reach a certain goal)".

3.2 Research questions

In CC1, the focus was set on older citizens by finding answers to the following questions:

- Which needs, challenges, desires & opportunities do older adults experience in urban planning & age-friendly cities (on the long-term)?
- Which needs, challenges, desires & opportunities do older adults experience in relation to the specific use cases (short-term)?
- Which role would older adults be able to play in tackling these challenges (e.g., sharing information)?

3.3 Methodology

In order to provide answers to the research questions above, a co-creation workshop was conducted in the three pilot sites: Helsinki, Flanders & Santander. Central to this workshop was a discussion between moderator and participants, in order to expose how the participating older citizens envision an age-friendly city. The methodology of this workshop was adjusted according to each pilot-site. The local project partners who conducted the workshop were also responsible for the analysis of the results (for the full topic list, see annex I).

3.3.1 Participant profiles

The following section provides an overview of the respondents that were involved at each pilot site.

Table 1: CC1 participant profiles all pilots

Helsinki	
Date	27/09/2021
Location	Digital
Data	Microsoft Teams recording
Miro Board	https://miro.com/app/board/o9J_lvaIjlA=/
Moderation	
Ville Nousiainen (FVH Moderator)	
Mari Sydänmaa (FVH Co-moderator)	
Christoph Fink (UH Observation)	
Elias Willberg (UH Observation)	
Ben Robaeyst (IMEC Observation)	
Respondents (N = 5)	
#1 - Male, 65+	
#2 - Female, 69+	
#3 - Male 65 +	
#4 - Female 67+	
#5 - Female 71+	
Flanders	
Date	13/10/2021
Location	Ghent, Belgium
Data	Audio recording
Miro Board	https://miro.com/app/board/o9J_lvaIjlA=/
Moderation	
Ben Robaeyst (IMEC Moderator)	

Sofie De Lancker (IMEC Co-moderator)	
Respondents (N = 11)	
#1 - Male, 70+	
#2 - Female, 80+	
#3 - Female, 70+	
#4 - Male, 70+	
#5 - Female, 65+	
#6 - Male, 70+	
#7 - Male, 70+	
#8 - Male, 65+	
#9 - Male, 70+	
#10 - Male, 65+	
#11 - Female, 70+	
Santander	
Date	27/09/2021
Location	Santander, Spain
Data	Field notes
Miro Board	Offline
Moderation	
Juan Echevarria (Santander city council Moderator)	
Celia Gilsanz (Santander city council Co-moderator)	
Silvia Urra (Tecnalia Co-moderator)	
Patricia Molina (Tecnalia Co-moderator)	
Mathias Maes (IMEC Observation)	
Respondents (N = 9)	
#1 - Male 75 +	
#2 - Male 80 +	
#3 - Male 75 +	
#4 - Male 70 +	
#5 - Female 50 +	
#6 - Male 85+	
#7 - Female 65+	
#8 - Female 60+	
#9 - Male 75 +	

3.3.2 Research protocol

In general, the co-creation workshop was conducted in three different phases:

Phase 0: Cultural probes (preparation for CC1)

- **What?** A series of assignments that the older citizens needed to complete during the week before the actual workshop.

- **How?** The older citizens received a journal which mentioned five assignments. This journal consisted out of an instruction manual for the assignments, questions the older citizens needed to answer regarding these assignments and writing space to keep track of their thoughts during the assignments.

- **Why?** In preparation for the workshop activities, a series of assignments have been conducted with the goal of 1) making the older citizens experience situations where poor accessibility potentially creates issues and 2) creating a higher level of awareness amongst the older citizens regarding accessibility in their neighbourhood environment.

- **Remarks:** The assignment journal was adjusted according to the use cases among the three pilot sites. An example of an assignment journals can be found in the attachment (see Annex I)**.**

Phase 1: Short-term use case (CC part 1)

- **What?** Discussion based on the completed assignments. During this phase, the moderator discusses the challenges, issues, and needs the older citizens stumbled upon during the completion of the assignments. This results in a discussion regarding the use case on the short term.

- **How?** During this phase of the workshop, all the assignments were discussed with the older citizens. To gather as much relevant data as possible, the moderator of the workshop asked extra questions to identify the needs, challenges, and opportunities (based on a topic list in Annex I). During the discussion, the co-moderator made notes of these insights. These were written down on a sheet of paper (Santander) or on a MIRO-board (Helsinki and Flanders).

- **Result: A longlist of needs, challenges, and opportunities regarding accessibility that the older citizens experienced in the current condition of their neighbourhood/city.**

Phase 2: Long term use case (CC part 2)

- **What?** Discussion regarding the long-term use-case of the pilot-sites.

- **How?** During this phase, the older citizens need to make their own version of the ideal accessible city. This was firstly done by writing down their own version of the ideal accessible city. Afterwards, each older citizens shared his/her own version of this ideal accessible city. During the presentation of the older citizens, the moderator probed by asking questions regarding the needs, challenges and opportunities the citizens see and have in order to realize this ideal accessible city.

- **Result: A longlist of needs, challenges, desires, and opportunities the older citizens experience regarding accessibility on the long term.**

Phase 3: internal meta-workshop to formulate user requirements (post-CC)

- **What?** An internal workshop with project partners in which user requirements are formulated based upon the needs, challenges, desires and opportunities the older citizens formulated during CC1.

- **How?** During this phase, researchers and project partners translated the output of CC1 with the older citizens to specify and reformulate user requirements. In dialogue, the project partners formulated the user requirements in the format of "As an older citizen, I want to be able (action) to (reach a certain goal)".

- **Result: A longlist of user requirements based on the insights that were gathered during CC1.**

3.4 Results

The goal of CC1 was to identify user requirements which older citizens have regarding an accessible, hence age-friendly city. By conducting the co-creation workshop format, a discussion between moderator and older citizens was established regarding these topics. More concrete, the challenges, needs, desires and opportunities that the older citizens experience were discussed in order to gain more insights in this matter. In the following result section of CC1, an overview of these insights and their translation into user requirements is given. All pilot sites were responsible for the analysis of the gained insights. Therefore, a slight difference in the way the insights are structured can be found in the results below.

3.4.1 Results CC1 Helsinki

During CC 1 in Helsinki, the older citizens mentioned a series of challenges, needs, desires and opportunities. Some notable need which could be identified in the use case of Helsinki is the **focus on infrastructure needs**. Here, infrastructure is key to an ideal accessible city for older citizens. In addition, the mentioned needs include the **walkability** of roads to important places in the Vuosaari neighbourhood. More concretely, the older citizens mentioned **proper surfaces to walk on during wintertime** when roads tend to be slippery. Next to the walkability of these roads, more **street signs** are desired which give an **indication of walking**

distances between relevant places in the neighbourhood. In combination with the needs for **proper and safe transportation**, the older inhabitants of Vuosaari desire a **clean and safe environment** where they can autonomously move from place to place with a clear estimation of moving time.

In order to improve the neighbourhood, older citizens want to take an active role in the design of their urban environment. However, some participants mentioned that previous attempts to communicate infrastructure needs did not get answered from higher hand. Consequently, the older citizens desire a **closed feedback loop when communicating with local authorities**. Older citizens can be involved by questioning them through **survey** and **telephone questionnaires**. When being asked about an **IOT-device** which can be used to share information about the direct environment, the older citizens showed a **tolerance** towards this idea, because it would make it easier to share this information.

Table 2 CC1 Long list of user requirements Helsinki

Helsinki longlist challenges, needs, desires and opportunities
Infrastructure needs ■ Good outdoor opportunities ■ Easy to pick different kind of routes depending on whether you have disabilities or not ■ Quite safe to walk ■ Trees and bushes that have grown very tall obscure the lights ■ In the wintertime patchy / non-sufficient ploughing, sanding ■ Close to the Columbus mall - grey concrete is slippery, it is hard to detect whether it is just wet or has ice under the water, no sanding ■ Ploughing leaves snowbanks that block access to the footpath ■ Some street signs for pedestrians lack the distances, would be nice to know how far it is to walk / bike to a certain point ■ Street signs are leading the wrong way, you can't be sure which way they are supposed to point ■ More opportunities for group sport for older adults (more places/services for older people) ■ The health centre situation ■ Service Centre is needed for the services (activities, sports, social interaction, affordable meals etc.)
Transportation needs ■ Drive / tunnel by the metro station is dangerous with the buses ■ Good public transportation ■ Allowed to take your bike onto the metro ■ Buses that connect to the metro should run frequently and also at night time ■ Special service buses "palvelubussit" (they can stop in front of our house, was an existing service) ■ Services should be near (everyday life services) ■ Good public transport
Safety needs ■ Groups of drunks/drug users make certain places not nice to go by ■ Who can you call except for the police ■ Safety in public places (criminal perception)

- People drive on the footpaths (delivery guys)
- Drivers won't stop at the stop sign causing dangerous situations

Comfort Needs

- Should activate the not-active older people
- Should help to find the lonely stay at home elderly
- Should help older people to do more "sports"
- Anticipation is important (for when they will get older), who would help even before the need is great
- Who can help you to prepare for the retirement and old age (updating their dwellings, nurses etc)

Information needs

- Using the clicker seemed pointless
- Using a device with which you can inform about obstacles sounds good

- It is good if you yourself don't need to write anything down
- Questionnaires, for more views
- Also doing interviews by phone would be good, might reach people that are staying home
- People designing and making decisions should have good local knowledge
- Save Vuosaari - motion (concern about the forest and the growth of population and the implications)
- Pelastetaan Vuosaari! - Adressit.com
- More services provided by the city and how do you find out about them - alueliikuttaja
- What kind of plans does the city have for the growing population and the growing number of older people

Communication needs

- Contacted the city but got no answer
- Older people want to be part of planning their city / neighbourhood
- Want to be asked questions regarding their needs / wants - they are the experts of their stage of life
- How to reach the not active people
- Okay with sharing information
- Face to face
- Workshops

Miscellaneous

- Front page | Sukupolvienkortteli
- Also, for living in (loneliness)

Helsinki longlist user requirements: As an older citizen…

1. I want to be able to plan a route that takes into account potential disabilities
2. I want to know where the sunny areas are
3. I want a safe walking pavement to walk on during the winter
4. I want my sidewalks to be free of obstacles (snow, ice, no sanding, ploughed snow)
5. I want to report and get feedback from my city when and where I can encounter obstacles.
6. I don't want non-pedestrians to move on the sidewalk.

7. I want drivers to respect the stop signs.
8. I want a safe infrastructure to use the buses.
9. I want to feel safe in public space by not being exposed to drug users and drug dealers.
10. I want to know who I should report to when I don't feel safe in a place.
11. I want to know what the distance is between point A and point B.
12. I want to have well maintained and up-to-date street signs.
13. I want to have more places where I can sit down
14. I want to test the final device that I will be using to report data.
15. I want to be informed about the obstacles I come along during a walk
16. I want a simple interface that does not require many inputs.
17. I want to participate in the decision-making process of my city, particularly regarding my needs as an older citizen. (by having physical workshops, questionnaires and/or phone interviews.)
18. I am concerned about real estate projects in my neighbourhood, in particular about the forests, the growth of population and the implications regarding this.
19. I want more sports facilities and sports-related services for older adults (activities, social interaction, affordable meals, etc…)
20. I want to know the location and occupancy level of health centres.
21. I want to be informed about the services provided by the city.
22. I want to be informed about the city's plans to address the needs of growing older populations.
23. I am concerned about my future needs as an older citizen.
24. I want to have more services feel less lonely by:
    - By activating the not-activate people in the local community
    - To find a home to stay for the older people.
    - By helping in doing more sports.
25. I want good public transportation with a regular and frequent timetable, including during the night time.
26. I want to be able to take my bike.
27. I want physical access to my everyday life services

3.4.2 Results CC1 Flanders

The Flemish participants of CC1 showed a similar series of needs as the Helsinki participants. First, a proper **infrastructure** with enough and **well-placed benches** and with the possibility of **safe and autonomous transportation** was discussed. Moreover, the **behaviour of other people** in the neighbourhood was seen as a big factor in having an accessible neighbourhood.

When being asked about information needs, a **single point of contact** was a major desire for the older citizens. More concrete, a **fixed telephone number with up-to-date information** can be used in order for them to ask all their questions regarding their neighbourhood. However, a **closed and fast feedback loop** is also a requirement which has to be met when communicating an issue concerning the neighbourhood.

The Flemish use case focussed on heat stress among older citizens within their neighbourhood. Here, the participants discussed that **situations where they have to withstand the heat for a long time need to be avoided** (E.g., long waiting times at traffic lights) because of **breathing issues** they experience. The impact of hot days on the infrastructure accessibility was also discussed. When riding a bike some bicycle lanes tend to

melt on these hot days, which makes it more dangerous to ride on them. In order to make their transportation more bearable, **water-fountains** and a **list of nearby points of interest**, so they don't have to walk as far and can plan going during the less hot periods of the day, can help them in managing this.

Table 3 CC1 Long list of user requirements Flanders

Flanders Longlist challenges, needs, desires and opportunities
Transportation needs ■ Relevant point of interest (places they need to go): ■ Essential care: doctors, pharmacies, physiotherapists, hospitals, homes ■ Other: service /community centres, shops ■ Important for Points of Interest (POI) is proximity to home ■ Preference for public transport, foot or bike, but: ■ Public transport is unreliable and often hard to access (esp. when there are construction sites and there are temporary stops) + hard to know which line to take when there are construction works going on ■ Need more knowledge on how to get where ■ Fine-grained public transport / tailored public transport is the 'ideal dream state' ■ Pedestrians: sidewalks not always of high quality, often (temporary) obstacles (e.g. shop stalls, garbage, ...), tram rails, ... ■ Cyclists: cycling roads of low quality, no separation faster and slower cyclists (separation possible?) ■ Cars less popular but is part of 'desire for freedom' and sometimes necessary (e.g. for shopping). ■ Still: cities are not made for them (or shouldn't be) ■ Tension between different traffic modalities: areas where different modes come together are usu. most problematic e.g. pedestrian streets with cyclists ■ Locations with a lot of traffic are perceived as dangerous and therefore inaccessible **Infrastructure needs** ■ Has good health care services ■ Has affordable housing e.g. social/public housing without long queues, and 'standard' housing options that are accessible to older adults ■ Are safe to navigate ■ Cities are aware of dangerous areas but seemingly don't do much with this info ■ Age-friendly city takes needs of people with disabilities into account (e.g., increased safety risk cfr. falling) ■ Has safe roads and sidewalks: ■ No holes in road ■ No uneven sidewalks, loose tiles, ... ■ Heightened sidewalks are a double-edged sword: increase accessibility to public transport (trams) but pose an increased risk for cyclists, who may bump into the sidewalk while pedalling ■ Minimizes dangerous stairs (esp. for people with disability) ■ Has safe crossroads ■ Location with different traffic modalities, and therefore perceived as more dangerous (see above)

- Has sufficiently many bus / trams stops

Comfort needs

- Specific needs when it is hot:
- Avoid situations where one has to wait in the sun on hot days (e.g. at traffic light)
- See also: waiting in rain on wet days (e.g. at traffic light)
- Hot days also lead to hot public transport or cabs and makes public transport even less appealing
- Issue with 'melting' cycling roads on hot days (especially those made with dolomite)
- Issue with breathing on hot days
- Currently, they change behaviour on hot days: postpone supermarket (or go earlier in day) > need info on opening hours, esp. for smaller, independent stores
- Age-friendly city provides water fountains (for drinking) > currently too few of those
- Clean environment (no litter)
- Quiet environment
- Clean & well-maintained bench (inc. painted)
- Pleasant location: located on walking routes, parks, but also shopping streets (rest stops)
- Profile of other bench users: sometimes do not want to use bench because other users are perceived as ‘strange’ or ‘not my type of people’
- Accessible bench (hand rail, back board to lean on, accessible & even pavement, not near cycling lane, room for wheelchair)

Information needs

- Need for centralized point of contact for all questions related to services
- Fixed number and email address + website
- Currently get info about public transportation by calling or by consulting booklet (but: need to know where to get this booklet)
- Prompt replies / limited waiting
- Up-to-date info
- Information services need to be easy to reach / contact / easy to get info from

Communication needs

- Open for feedback / listens to citizens (also older adults) e.g. through relationships with advisory associations
- Often feel frustrated about lack of feedback / slow answers / slow action from city administration when flagging issues
- City takes action based on this feedback
- Closes the feedback loop by communicating back / providing answers about their actions or the reasons for inaction (e.g. other priorities)
- Accessible: digital + audio description + paper (brochure) > mixed media
- Message needs to be clear (simple, transparent, ..)
- Potential communication channels:
- Phone (e.g. Gent info)
- City magazine / paper
- Online (e.g. Google)
- Physical map
- Website (e.g. digital map)
- 3rd parties e.g. 'mutualiteiten'

Flanders Longlist user requirements: As an older citizen…

1. I want reliable public transport
2. I want easy to access public transport (e.g. bus stops)
3. I want easy to access information about public transport
4. I want high-quality sidewalks (even, not too high borders, no loose tiles, no holes, ...)
5. I want obstruction-free sidewalks
6. I want safe cycling roads that separate fast and slow cyclists
7. I want the public domain to take the needs of people with disabilities into account
8. I want to know where dangerous crossroads and other traffic situations are
9. I want my city administration to give me options for feedback/input/questions
10. I want my city administration to acknowledge my effort/feedback/input/questions
11. I want my city administration to take action based on my effort/feedback/input/questions
12. I want my city administration to provide answers to my questions (close feedback loop)
13. I want fast communication (direct response, no queues) from my city administration
14. I want a single point of contact for all questions related to city services (phone + email)
15. I want info related to city services to be updated
16. I want visual information to be available on both digital and physical maps
17. I want digital information to be complemented by physical carriers (e.g. brochure)
18. I want to find information on city services in the city newspaper/magazine
19. I want to receive relevant information through 3rd party services
20. I expect accessible and available health care services
21. I want a doctor close by
22. I want a hospital close by
23. I want shops close by
24. I want a pharmacy close by
25. I want a physiotherapist close by
26. I want a service centre (dienstencentrum) close by
27. I want to easily reach homes / care centres
28. I expect affordable housing (e.g. social housing, regular housing that is adapted to needs of OA)
29. I want a clean environment (no litter)
30. I want to be able to walk around or sit in a quiet environment
31. I want to sit at a clean & well-maintained bench (inc. painted)
32. I want benches to be located on walking routes, parks, but also shopping streets (rest stops)
33. I want one central point of contact for all questions related to services.
34. I want crossroads to safe crossroads (to increase my general sense of safety in traffic)
35. I want to use public transport with air conditioning [on hot days]
36. I want to have public drinking fountains [on hot days]
37. I do not want to wait in an exposed location (e.g. at traffic lights) during extreme weather conditions
38. I would like to have alternative solutions to reach primary services (e.g. doctor, groceries) during extreme weather days
39. I want to feel safe on mixed-use roads (traffic modalities)
40. I don't want to be forced to use a car to get somewhere by having adequate public transport, biking or cycling options
41. I do not want steps that interfere with the sidewalk
42. I want safe stairs or ramps to access places if needed
43. I want a safe space to bike, esp. In proximity to heightened sidewalks (e.g. tram stops)

3.4.3 Results CC1 Santander

In Santander, the **infrastructure** needs were also discussed during the workshop. In similarity to the other pilot sites, an **accessible and safe environment is fundamental** to the older participants. This environment needs enough **well-placed benches and traffic lights** which give the citizens enough time to cross the streets. The workshop in Santander focussed on the use of accessibility infrastructure within the city. In general, the older citizens are satisfied with these **escalators, ramps and lifts**. However, **good maintenance** on a regular base is essential for them. A big factor in the accessibility of the neighbourhood is whether the older citizens **feel safe** when moving to different points of interest. Here, similarities with the other pilot sites are found, such as the behaviour of other people in traffic and on the escalators and lifts.

Table 4 CC1 Long list of user requirements Santander

Santander Longlist challenges, needs, desires and opportunities
Infrastructure needs ■ Miguel would highlight that more **public urinals** spread in the city are needed. ■ Ramon would like to add that there is a serious **lack of public and private car parks** ■ Gemma explained that she suffered from an illness that put her in a wheelchair and now she needs to use a crutch. She moves walking but needs to sit down often. Gemma made interesting contributions such as, the **need to place more benches** and to improve the distribution, as in some areas there are many benches in a row and in others none at all. ■ There are **traffic lights** that are very short for pedestrians and dangerous for older ones. ■ There are **certain pavements,** such as the ones in the Pump House near the Duna de Zaera, which are **very slippery** and are a real danger, especially on rainy days. ■ Pablo would add that he is 84 years old and his mobility is reduced, he walks very short distances and needs to sit down frequently. His wife has **mobility problems,** needs a walker and cannot walk up or down steps, so he uses the car to take his wife to the hairdresser's and to the market. Once a week he takes her to the Esperanza market. In order for his wife to get out of the car he has to look for a place without steps and the only place he has found is a zebra crossing which is lowered, causing a small traffic jam. His idea is that there should be a **place where people with reduced mobility can easily get off without interrupting traffic.** ■ All the participants have a very **positive idea of the vertical mobility infrastructures,** whether they are regular users because they live in an area of Santander with slopes or travel to places where the orography of Santander makes it difficult to move around, or the participants who indicate that they do not use them on a regular basis. ○ All the participants agree in their positive opinion, believing that it is a great advance, **especially for older citizens,** although they indicate that all citizens use them. ■ The participants agree that the a**spect to be improved is the maintenance** of the infrastructures, because when the escalators do not work, the citizens do not know it until they are going to use them, and this is **especially annoying and shocking in the daily life of older people.** ■ The insights gathered were as follows: ○ motorcycle on sidewalk ○ scaffolding ○ scaffolding with bars lying on the sidewalk and lifting element ○ Mattress on trash container

- Storm tank vent
- Dog poop
- Skate circulating on the sidewalk

Safety needs

- The reason for moving on foot is because it is faster than other transport modes but he uses taxis in case of urgent journeys. Also, Alberto would add that it is more and more difficult to move on foot because the **high number of electric scooters, skates and bicycles**.
- Alberto believes that the reasons why these vehicles circulate on the pavement are the lack of civility, the **lack of road safety education** and that the **network of cycle lanes has become too small**, given that every day there are more people who use them and when they are busy, they decide to ride on the pavement, which is a danger for pedestrians.
- It was commented that the stairs are often stopped, but not because of a breakdown but because of vandals who press the safety button to stop them, and that maybe there is a way to make this button available but not so easy for the vandals, for example that the existing cameras can identify these people and the town hall can find them.
- Several participants indicated that due to claustrophobia, **lack of cleanliness** in some cases and fear of covid19, they preferred ramps to lifts

Transportation needs

- Rosa uses public buses and she would like to highlight that despite **buses have ramps for people** on wheelchair and children in pushchairs she had really bad experiences because **unsympathetic people** and also because of **bus driver behaviour.**

Information needs

- They **would like to be able to know** before leaving home if the staircase ramp or lift is broken in order to decide what to do, as well a**s to be able to report a breakdown** in a simple way.
- it was commented that they would like to be informed about new infrastructure (ramps, stairs...) in the city.

Santander Longlist user requirements: As an older citizen…

1. I want the sidewalk to be free of electric scooters, skaters, and bicycles
2. I want the best distribution of benches around the city
3. I want the pavements to be free of slippery spots on rainy day
4. I want adapting traffic-light-regulated zebra crossings
5. I want bus drivers to be more sympathetic towards entering a public bus with a wheelchair
6. I want cleaner ramps and escalators
7. I want more public toilets around the city
8. I want to use digital channels to be informed of activities or to report incidents on the street themselves.
9. I want to be informed of the state of the infrastructures such as ramps, escalators etc. to be used or not before leaving home

3.5 Conclusion CC1

Over the three pilot sites, CC1 exposed a few similarities in what needs older citizens experience when discussing an accessible city. The fundamental element of this ideal city is **the need for a safe and physical accessible city**. Sidewalks, roads, and bicycle lanes need to be safe to walk, and ride on. In addition, the behaviour of other people within the neighbourhood has a big impact on the perceived safety of older citizens when moving to different places of interest.

These similarities show that older citizens among the three pilot sites share a common idea of what an accessible city should look like. However, local geographical circumstances, climate and weather conditions also show a few differences among the three pilot sites. The participants in Helsinki discussed more winter conditions and its impact on the local accessibility. In Flanders the “hot weather use case” was discussed, which showed needs and desires during hot summer days, and in Santander the local orography influences the needs of older citizens.

Consequently, based upon the findings of co-creation workshop 1, we were able to identify how older citizens envision an age-friendly, more particularly from an accessibility point of view. The gathered insights show that older citizens have a series of expectations in how an age-friendly city should look like and what elements should be present in order to achieve this goal. As one of the goals of this project is to create a digital ecosystem which contributes to providing this age-friendly city or neighbourhood, these expectations were translated in a concrete user-requirements. These user-requirements show great similarities with the URBANAGE-indicator framework. Hence, these insights were clustered using this framework and processed as input for co-creation session 2 and 3.

4 CC2: Needs, barriers & challenges (civil servants)

Figure 4 CC2 Workshop in Santander

Figure 5 CC2 Workshop in Santander

4.1 Goal

The second co-creation workshop was targeted to civil servants in the different URBANAGE pilot cities. The goal was to validate the requirements collected during CC1, assess its feasibility, and collect information about existing initiatives and departments linked to the project. Here is the full list of goals:

- Introducing the URBANAGE project and the goal of the pilot
- Mapping existing initiatives, challenges, collaborations, and key actors.
    - Map current projects and initiatives related to age-friendly cities and older adults.
    - Map existing challenges that Civil Servant are experiencing on the topic of age-friendliness and older adults for these projects / initiatives
    - Map existing or necessary collaborations between different city departments and establish their role in the use cases.
    - Map key actors and departments that should be involved in the URBANAGE project (or other age-friendly initiatives).
- Validate the relevance of the user requirements for civil servants collected during CC1.
- Identifying (technical) constraints & challenges related to the implementation.
- (Optional) Mapping technology adoption

4.2 Research questions

In CC2, the focus was set on civil servants by finding answers to the following questions:

- Which are the existing initiatives at city level that can improve older people´s quality of life? What challenges & opportunities do civil servants find in terms of urban planning for age-friendly cities?

- Which are the potential collaborations that should be happening among different city departments to tackle these challenges, and which are the key actors that should be involved?
- Which data sources are available at city level to measure the age friendliness of the urban environment?
- What challenges & opportunities do civil servants find in the use of new technologies in the urban planning and civic engagement fields?

4.3 Methodology

Three co-creation workshops with Civil Servants were conducted in the three pilot sites: Helsinki, Flanders & Santander. One complementary interview was conducted with Civil Servants of the City of Ghent in Flanders. Some adaptations were made according to the specificities of each pilot-site.

4.3.1 Participant profiles

Table 5 General information about the CC2 workshop in Helsinki

CC2 HELSINKI	
Date	01/10/2021
Pilot	Helsinki
Co-creation type	Co-Creation workshop with civil servants
Digital / non-digital	Digital
Recorded	Yes

Table 6 Participant's list to CC2 workshop in Helsinki

Participants		
#	**Name**	**Organization/Profile**
1	Juanita Devis (facilitator)	IMEC VUB
2	Ville Nousiainen	Forum Virium Helsinki
3	Mari Sydänmaa	Forum Virium Helsinki
4	Christoph Fink	University of Helsinki
5	Antti Mentula	City of Helsinki, Urban planning, Architect
6	Sari Jurmo	City of Helsinki, Urban planning, Eastern Helsinki, Landscape architect
7	Kaisa Koskinen	City of Helsinki, Urban planning, Eastern Helsinki, Service designer
8	Anu Kiiskinen	City of Helsinki, Urban planning, Team leader of East Helsinki urban planning

9	Elias Willberg	University of Helsinki
10	Silvia Urra	Tecnalia

Table 7 General information about the CC2 workshop in Flanders

CC2 FLANDERS	
Date	28/09/2021 Additional interview 04/10/2021
Pilot	Flanders
Co-creation type	Co-Creation workshop with civil servants
Digital / non-digital	Mixed session (physical / digital)
Recorded	Recorded on Teams

Table 8 Participant's list to CC2 workshop in Flanders

Participants		
#	**Name**	**Organization/Profile**
1	Juanita Devis (facilitator)	IMEC VUB
2	Sofie De Lancker (facilitator)	Imec
3	Bart Vermandere	Accessibility Manager, Ghent
4	Sophie Desimpel	Accessibility coordinator, Ghent
5	Gino Dehullu	Smart City Manager, Roeselare
6	Wouter De Spiegelaere	Data specialist Strategy Department, Roeselare
7	Lina Juvens	Data/AI expert, District 9 (Ghent)
8	Korneel Morlion	Urban developer, Roeselare
9	Bart Rosseau - interview	Head data & Information, Ghent
10	Freya Acar	Project coordinator data, Ghent

Table 9 General information about the CC2 workshop in Santander

CC2 SANTANDER	
Date	23/09/2021
Pilot	Santander

Co-creation type	Co-Creation workshop with civil servants
Digital / non-digital	Physical
Recorded	No

Table 10 Participant's list to CC2 workshop in Santander

Participants		
#	**Name**	**Organization/Profile**
1	Silvia Lastra	Citizen participation
2	Jose Antonio Moya	Information Technology
3	Antonio Bezanilla	Urban Planning
4	Eduardo Trugeda	Municipal Financial Controller
5	Tomás García	Police
6	Laudelino J. Otero	Social services
7	Celia Gilsanz	Innovation
8	Juan Echevarría	Innovation
9	Patricia Molina (facilitator)	Tecnalia
10	Silvia Urra (facilitator)	Tecnalia

4.3.2 Research protocol

In order to provide answers to the research questions above, a co-creation workshop format was conducted. Central to this workshop, a discussion between moderator and participants was hold, in order to expose how the civil servants approach the needs and desires of older citizens in their different city departments and to know more about the current state of the different cities regarding age-friendliness. The methodology of this workshop was adjusted according to each pilot-site. The local project partners who conducted the workshop were also responsible for the analysis of the results.

This co-creation workshop was conducted in three different parts:

<u>Part 1. Mapping at city administration level existing initiatives, challenges, collaborations, and key actors</u>

- What are your current initiatives?

Civil servants from each department presented their current active ageing initiatives, programmes, and challenges.

  - *Civil Servants mapped their current projects and initiatives that address the needs of the ageing population in the urban environment. (it could be any initiatives related to healthy cities or smart*

cities, or any that could have an impact on improving the experience of "using" the city for older people)
    - *Civil servants indicated which initiatives/projects they consider more relevant for URBANAGE.*
- Shaping of the use case

Starting from the existing needs, barriers, challenges, and current projects.
    - *Civil Servants indicated their challenges to address the needs of older adults in the urban environment.*
    - *Participants voted the most relevant challenges*
    - *Participants indicated what challenges could be addressed by the URBANAGE pilot*
- Age-friendly initiatives and collaborations

To make cities age-friendly is a transversal issue that must be tackled by different city departments. The question that was launched was: Which are the ones that should be involved? and which would be the role of each of them in the use-case?
    - *Participants drafted a list of the departments they think should collaborate/participate to address the needs of the pilot and of older citizens*
    - *Participants mapped active and lacking collaborations*
    - *Participants mentioned what are the barriers for the lacking collaborations.*

Part 2 - From user requirements to data sources and models

The goal of this part was to research into the data the civil servants usually work with in relation with age-friendly cities and to have an idea about their perception towards the Digital Twin pilot solution. This part of the workshop was originally designed as two different sessions targeted to the specific profiles and expertise of Civil Servants: one with the civil servants working in the specific city departments and the other one with those civil servants in charge of all the ICT side of the city council (data). However, due to the lack of ICT profiles among the participants in each pilot, none of the pilots held two separate sessions.

CITY DEPARTMENT SIDE

- What? URBANAGE indicator framework.
    - Identify from the list the URBANAGE indicators (knowledge) you think may be relevant for addressing the needs of the ageing population in your city. Why?
    - From the previously selected indicators, select the ones that you think are relevant for the pilot. Why?
- Knowledge to data
    - In the context of the pilot and addressing what type of knowledge/information is needed to make better decisions?
    - Is this knowledge supported by the data available at city level?
    - What data is missing?
    - What operations would you like to do with your data to get better insights?

Part 3: internal meta-workshop to formulate user requirements

This part of CC2 took place the day after the workshop with the participants. The goal of this discussion is to cross the information resulting from this session CC2 with the "user requirements"

resulting from the session with the older citizens CC1, with the intention to finetune the CC3. In this discussion session, the people who conducted the workshop at the pilot site with the older citizens presented the results and in collaboration with the ones conducting the CC2 session with civil servants checked the methodology prepared for CC3 (mixed session with older people and civil servants). Moreover, the outcomes of this activity were used as a base for this report for CC1 and CC2.

4.4 Results

In this section we describe the results obtained during the CC2 (second co-creation workshop) in the three pilot cities. First, we describe key findings obtained from mapping existing initiatives, collaborations challenges related to addressing the needs of older people in the urban environment. Second, we describe the main results obtained from mapping the civil servant requirements.

4.4.1 Results CC2 Helsinki

4.4.1.1 Mapping existing initiatives, challenges, collaborations, and key actors

During this part of the workshop, civil servants from Helsinki mapped the existing initiatives, the challenges they are currently facing and finally the collaborations they consider are relevant in addressing the needs of older people in the urban environment. Based on these results we defined the civil servants' main requirements.

Among the existing initiatives, participants reported one from the urban planning department related to the collection of accessibility data of the public spaces and recommended to contact the responsible (see Annex II -i). Civil servants were then invited to report the main challenges, which are listed below:

- **Accessibility information is hard to find** ('not stored anywhere'), or it is not properly maintained (e.g., not updated).
- **Design documents** (e.g., masterplans of new neighbourhoods or for neighbourhood renewal) **are not transferred to data registers** and cannot be used further. Documents are typically in pdf format and cannot be linked to other datasets, creating data silos.
- **Data is not structured at different level of granularity**. Some information is too detailed to be used in practice or too generic to be relevant. It is challenging to use data from another urban scale. In land use detail planning, the data level is **too general** to tackle the actual problems that older people deal with daily. It is always difficult to find the balance between high and low level of granularity.
- Not all the public areas are accessible because of the hilly terrain. Civil servants would like to know **what are the places that are more attractive** for older people to make them accessible. (Topography).

- Civil servants **don't have enough information about the needs and interest** of older people in the public space.

Figure 6 CC2 Screenshot main challenges affecting civil servants in Helsinki

When mapping the potential collaborations, participants listed nine departments related to the design and management of the urban environment and mobility. One participant also listed the social services department as an important actor to include (see Annex II .ii).

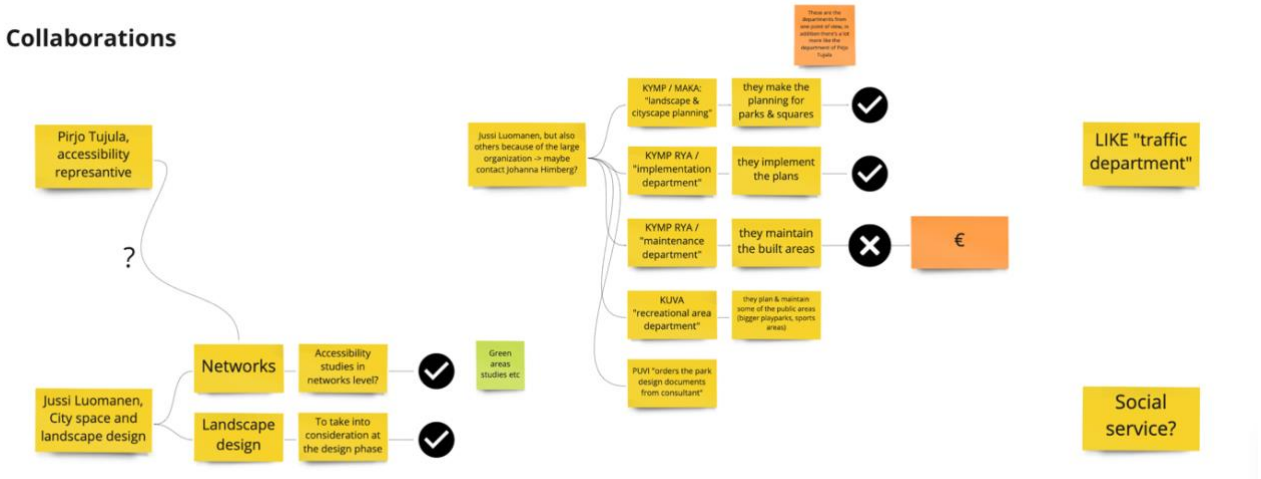

Figure 7 CC2 Screenshot relevant collaborations board Helsinki

As a result of the previous activities this is the list of the main requirements reported by civil servants:

- **Easy access to updated accessibility data**.
- Availability of **accessibility data** (e.g., not in a pdf) **that they can link together** (data silos, usable formats, linked data).
- Being able to filter data according to the specific needs and urban scale. They would **like** data to be **filtered to be usable** (not too detailed and not too generic)
- Availability of data at different urban scales **data at scale**: Masterplan, neighbourhood level, city level.
- Simple way to **work with data at different scales**.
- Information about **what are the places that are more attractive for older people** so they can make them accessible.
- Access to data to support their activities in **understanding the specific needs and interest of older people**.

4.4.1.2 From user requirements to data sources and models

In preparation for the activity, a preselection from the URBANAGE indicators framework (see Annex II .iii) together with the user requirements collected during CC1 was made. During the activity, participants identified the most important ones and motivated why they consider them important.

Figure 8 CC2 Screenshot relevant indicators board Helsinki

Table 11 CC2 Relevant URBANAGE indicators and user requirements for Civil Servants Helsinki

Indicator	Relevance for Civil Servants of the most important indicators	CC1
*Number of **rest places** and distance between rest places*	In order to go outdoors without being worried about how to manage it if physically not in that good shape anymore. The resting places are especially important to older adults among different user groups of public spaces.	As a User I want to have more places where I can sit down
***Sidewalks**, trails and walkways present and in a safe condition (e.g. with smooth surfaces, curb cuts, separate bike lanes; wide, well lit, clear of ice and snow)*	Older people have more problems with badly maintained or dangerous streets. (Accidents)	As a user I want a **safe pavement to walk during the winter.**
		As a user I want to report and get feedback from my city when and where I can encounter obstacles.
		As a user I want my **sidewalks to be free of obstacles** (snow, ice, no sanding, ploughed snow)
Location and capacity of (care) services for older adults e.g. hospitals, service	Older people need their services close because it's more difficult for them to move long distances. Walkable distance to the services.	As a User I want to know degree of occupancy in the health centres and the location

flats, pharmacies, local supermarkets, ...		of these centres.
		As a User I want convenient access to the services I use in my everyday life, at a reasonable travel time/distance
Maintenance data greenery		As a user I want to like the trees to be properly maintained to allow the light to pass.
Location of public green	Older adults need the public spaces close to their home to be attractive and easy to use, because of mobility challenges.	
Bike friendly Public transport	There are also older adults who ride bike.	As a User I want to be able to take my bike in the public transport
Proportion of older adults among all reported visitors to local cultural facilities and events Proportion of older people who are members of a self-organized or institutionalized leisure-time physical activity group Proportion of older people who report participating in group physical activities in their leisure time	Loneliness is a specific issue with older adults after their working life is over. In that sense the events are especially important for them to be available.	As a User I want to have more services feel less lonely by: By helping in doing more sports, By helping older people to find a home to stay., By activating the not-activate people in the local community
		As a User I want more sport facilities for older people.
		As a User I want service centres (activities, sports, social interaction, affordable meals etc.)
Participation in decision making and representation	It's important for older people to be heard.	As a User I want to participate in the decision making of my city, more particular regarding my needs as older people. (As a User I am concerned about my future needs as an older citizen)
		As a User I want to participate by: being informed, Having face to face workshops, Filling in questionnaires, By interview through the phone
		As a User I want to test the final device that I will be using to report data.
Clear communication and accessibility of information such as opening hours, contact information etc.	Older adults have more difficulty in understanding and accessing the information available (E.g., obstacles, road works, services).	As a User I am concerned about real estate developments in my neighbourhood in particular about the forests, the growth of population and the implications regarding this.

		As a User I want to be informed about the obstacles I come along during a walk
		As a User I want to know be informed about the services provided by the city.
		As a User I want to be informed about the city plan to address the needs of growing older populations.
Proportion of older adults who are digitally savvy	Even though the digital services have to be designed as easy as possible it does not help if the older adults do not know at all how to use digital tools.	As a User I want a simple interface that does not require many inputs.
		As a user I want to report and get feedback from my city when and where I can encounter obstacles.
		As a User I want to test the final device that I will be using to report data.

4.4.1.2.1 Relevant data sources related to the selected URBANAGE Indicators

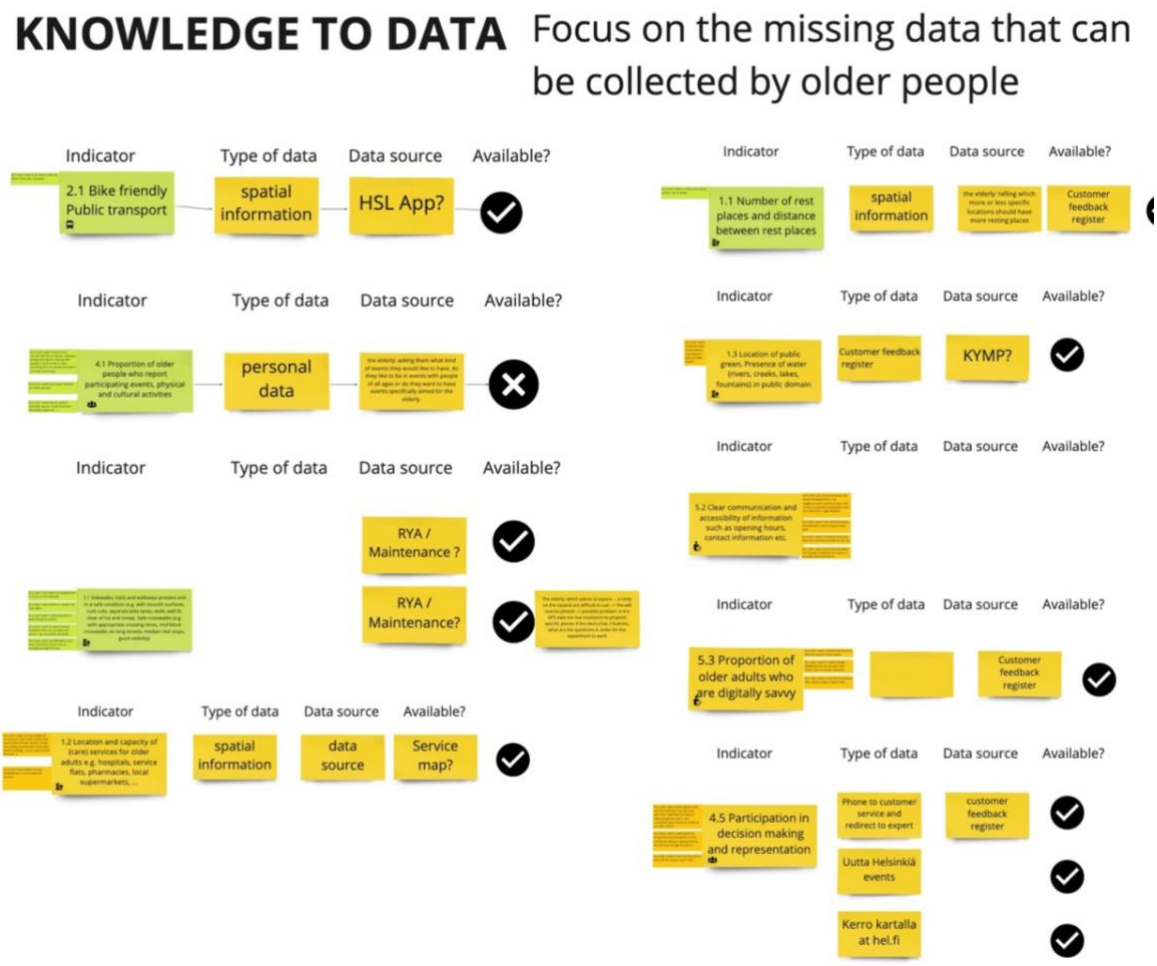

Figure 9 CC 2 screenshot Relevant data sources in Helsinki related to the URBANAGE prioritized Indicators

Table 12 Relevant data sources in Helsinki related to the URBANAGE prioritized Indicators

Target topic	Relevance for Civil Servants of the most important indicators	Relevant data sources
Number of rest places and distance between rest places	In order to go outdoors without being worried about how to manage it if physically not in that good shape anymore. The resting places are especially important to older adults among different user groups of public spaces.	Customer feedback register (check). Collect data of which specific locations should have more resting spaces.

Sidewalks, trails and walkways present and in a safe condition (e.g. with smooth surfaces, curb cuts, separate bike lanes; wide, well lit, clear of ice and snow)	Older adults have more problems with badly maintained or dangerous streets. (Accidents)	RYA / Maintenance (verify if this data is accessible, updated and can be easily used). This information can be complemented by gathering feedback from the IoT device.
Location and capacity of (care) services for older adults e.g. hospitals, service flats, pharmacies, local supermarkets, ...	Older people need their services close because it's more difficult for them to move long distances. Walkable distance to the services.	Service map only for locations, KYMP (Customer feedback register)
Greenery & Water	Older adults need the public spaces close to their home to be attractive and easy to use, because of mobility challenges.	Service map only for locations, KYMP (Customer feedback register)
Bike friendly Public transport	There are also elderly who ride bike. Older adults still ride their bikes.	HSL App, investigate if this data is available
Engagement in sociocultural activity Participation in leisure- time physical activity in a group	Loneliness is a specific issue among older people, after their working life is over. In that sense the events are especially important for them to be available.	Gather information from senior citizens about what kind of events they would like to participate and validate if they prefer to join age targeted events or general
Participation and representation	It's important for older people to be heard.	Phone to customer service and redirect to expert: KYMP (Customer feedback register), Uutta Helsinkiä events, Kerro kartalla at hel.fi closed 2018
Information availability	Older adults have more difficulty in understanding and accessing the information available.	-
Digital skills	Even though the digital services have to be designed as easy as possible it does not help if the older adults do not know at all how to use digital tools.	KYMP (Customer feedback register)

4.4.1.2.2 Models

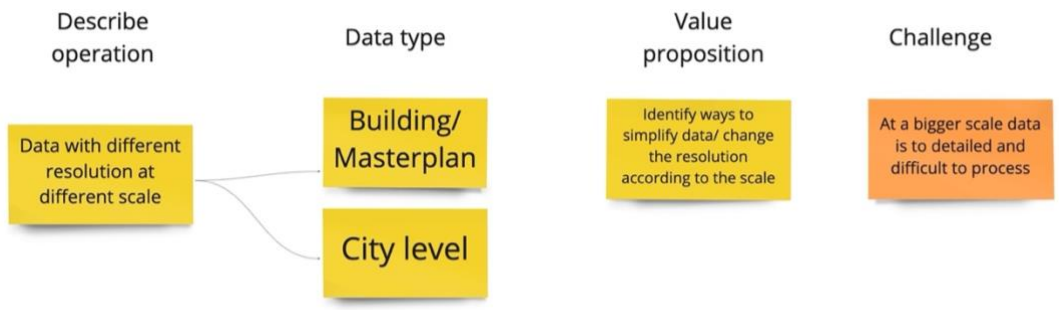

Figure 10 CC2 Models proposed by the Helsinki participants

4.4.2 Results CC2 Flanders

4.4.2.1 Mapping existing initiatives, challenges, collaborations, and key actors

During this part of the workshop civil servants from Flanders mapped the existing initiatives, the challenges they are currently facing and finally the collaborations they consider are relevant in addressing the needs of older people in the urban environment. Based on these results we defined the main requirements on civil servants.

Participants listed eight initiatives (see Annex II .i) related to addressing the needs of older people in the urban environment. Five initiatives were from the city of Ghent, two from the city of Roeselare and one from the Flemish region. Four initiatives were related to the well-being of vulnerable population and to help them. Two were related to accessibility of the public space and services and one to provide mobility services to people with reduced mobility.

Civil servants were then invited to report the main challenges, which are listed below:

- Civil servants **don't have enough information about the needs and interest** of older people in the public space.
- It is **often difficult to adapt the public domain to the needs of older people**, even when the physical accessibility issues are well-known. In the city centre of Ghent, for example, it is very difficult to intervene and actions such as replacing the cobblestones cannot be done.
- High-quality yet affordable housing is not always readily available and renovating existing houses can be expensive.
- The increase of demand of first care services is unproportioned in respect with the current expansion rate. Moreover, first line services (E.g., doctors, pharmacies) are not always easy to access or to reach.
- New strategies to reach isolated older adults.
- Mobility options a public transport often cannot match the needs of accessibility and frequency of older adults. In Roeselare, the low urban density of residential areas together with the current zoning poses extra challenges when creating mobility solutions to connect those areas to services or to the city centre.
- In some cities, small neighbourhood shops, grocery stores and other services are being replaced by malls, that are typically reachable only by car.
- Ensuring digital applications, product and services remain accessible for older citizens.
- Lack of domain experts in the process of indicating what metadata is relevant.
- Using data sources outside of their intended context of use is often difficult, it often results on a lack of availability of information.

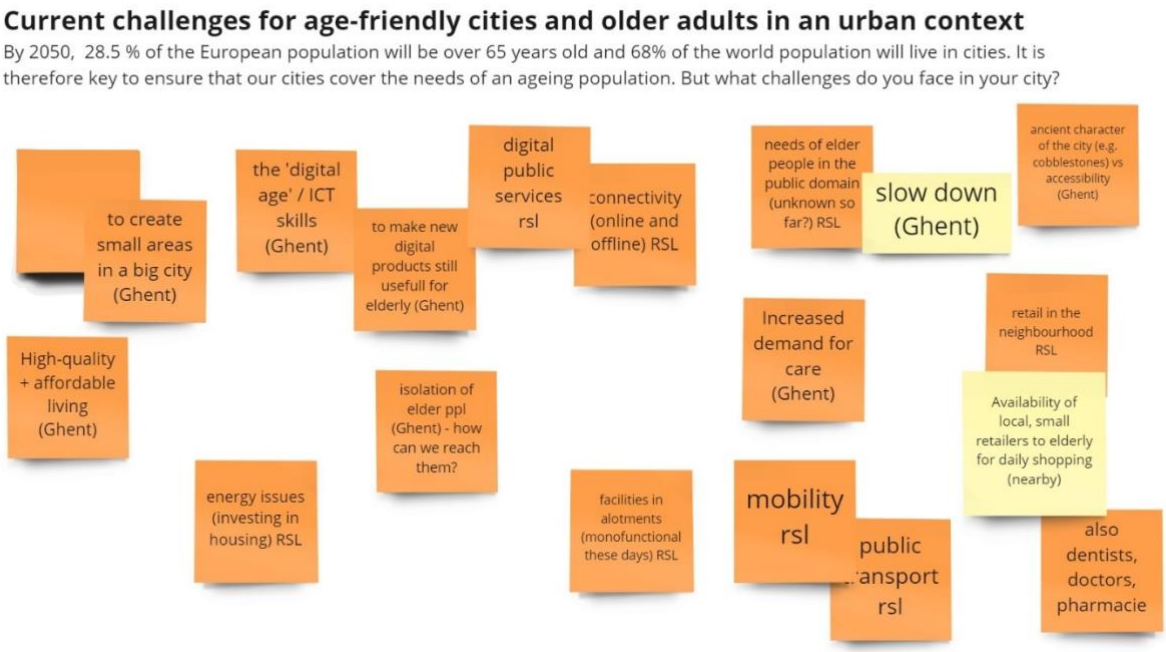

Figure 11 CC2 Screenshot main challenges affecting civil servants in Flanders

Civil servants reported to be aware about the importance of cross-department collaborations but indicate that it is hard in practice due to existing silos. Consequently, they feel there is a need for a better exchange of data. Moreover, the complex governmental structure in Belgium, with its fragmented and distributed responsibilities, makes it extra challenging to centralize information and data.

Participants reported Ghent is overcoming some of these challenges by having a Data and Information department that tries to shift the mindset from 'data as a problem' to 'data as a product', advocating the use of a clear data owner who knows which data is needed to address a certain issue, and who will look for the right data to combine.

When mapping the potential collaborations, participants listed ten (see Annex II .ii) potential collaborations. Six city departments related to welfare, urban planning, infrastructure, data and information and youth. Moreover, they recommended to contact older adults' care associations, healthcare organizations and other governmental associations.

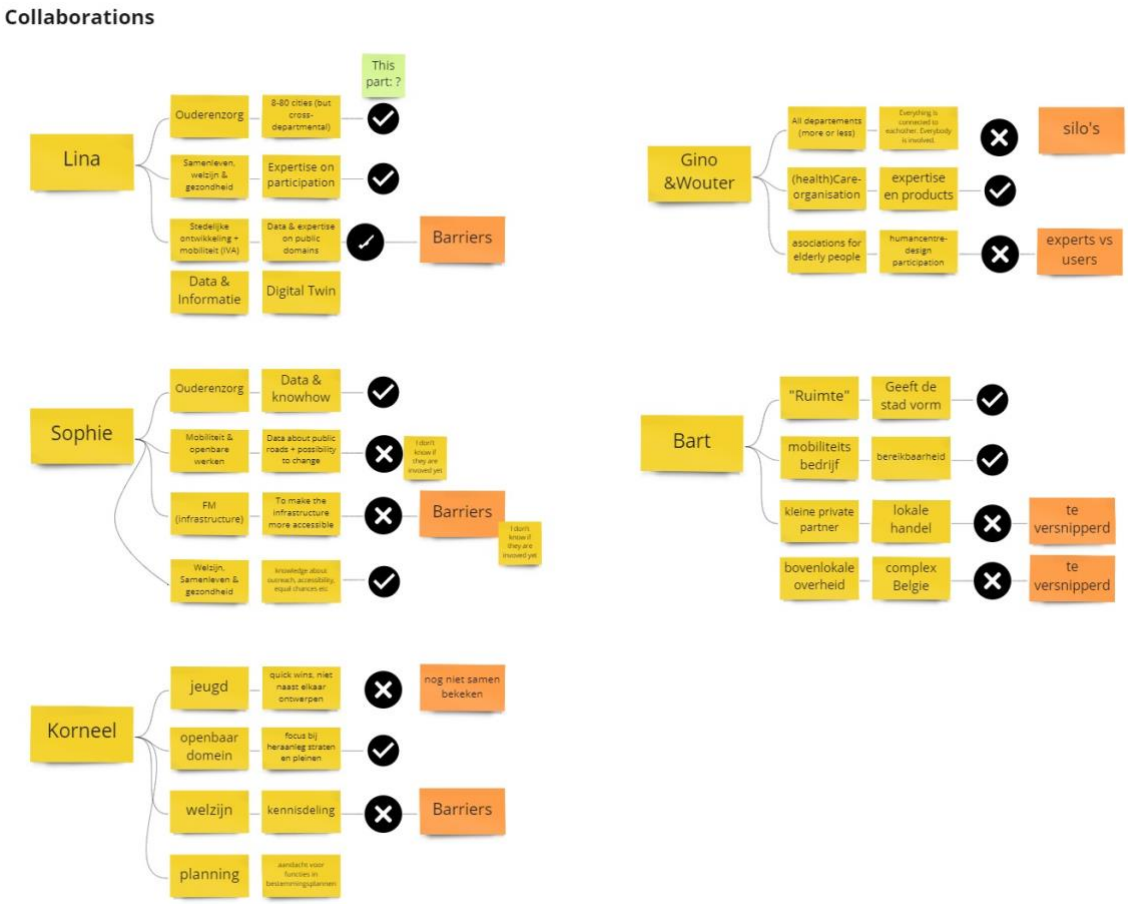

Figure 12 CC2 Screenshot relevant collaborations board Flanders

As a result of the previous activities this is the list of the main requirements reported by civil servants:

- Availability of data about the **needs older adults have** in the **public domain (data deserts).**
- Availability of data to **understand and predict the demand for care services.**
- Availability of data about **essential services** (E.g., health care, shops) are **accessible and reachable.**
- Availability of data about **accessibility / reachability of low-density urban development projects.**
- Data **usable at different urban scales**.
- Data **easy to consult and make sense of (searchable, linkable)**
- Bridge **the gap between domain expertise** (what is the issue) **and data knowledge** (what data do I need to solve the issue).
- Ensure **digital applications we develop are accessible to everyone**.
- **Identify strategies to reach older adults who have become isolated**
- An **intuitive front-end that helps me communicate insights and information efficiently to my target group** / citizens

4.4.2.2 From user requirements to data sources and models

4.4.2.2.1 User requirements and URBANAGE indicators

Note: For Flanders (a region rather than a city), a modified procedure was followed to define the use case(s). AIV and IMEC organized a series of separate preparatory co-creation sessions together with the different potential pilot cities in Flanders. Together, the different stakeholders involved refined and developed the use cases and, in the process, identified some additional relevant indicators.

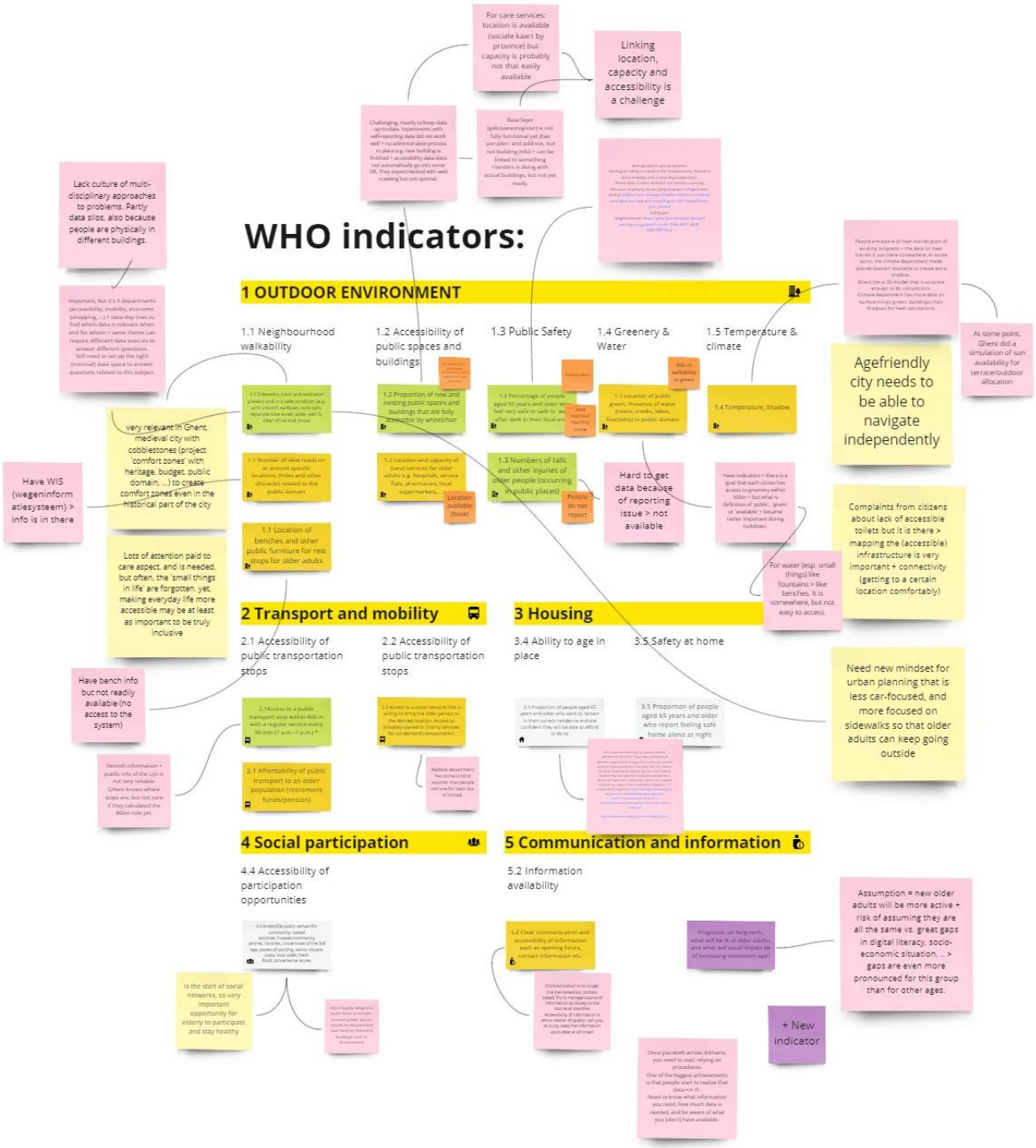

Figure 13 CC2 Screenshot all the proposed URBANAGE indicators in Flanders

Preliminary insights CC1

In general, some indicators related to safety (safety at home and safety at night) were not validated or mentioned by the older adults. On the other hand, the perceived sense of safety in traffic was very important to the older adults, in particular in those situations where traffic modalities meet. Other indicators, such as the information and communication needs, were validated by a whole list of requirements and seemed to be much more important than anticipated in advance.

Community centres / social service centres played a very important role in the lives of older adults:

- Place to meet (new) people
- Place to get information and support (e.g., help with applying for subsidy)
- Means of preventing loneliness (e.g. call circles or check-ups by centre during covid lockdowns)
- Means to keep active

4.4.2.2.2 Relevant indicators for use cases

Note: Similar to the listing of the indicators, some of these explanations by civil servants were not touched upon in this particular co-creation session but were mentioned in one of the earlier co-creation sessions between AIV, IMEC and the different Flemish cities. These inputs are marked with an asterisk (*) in the table below.

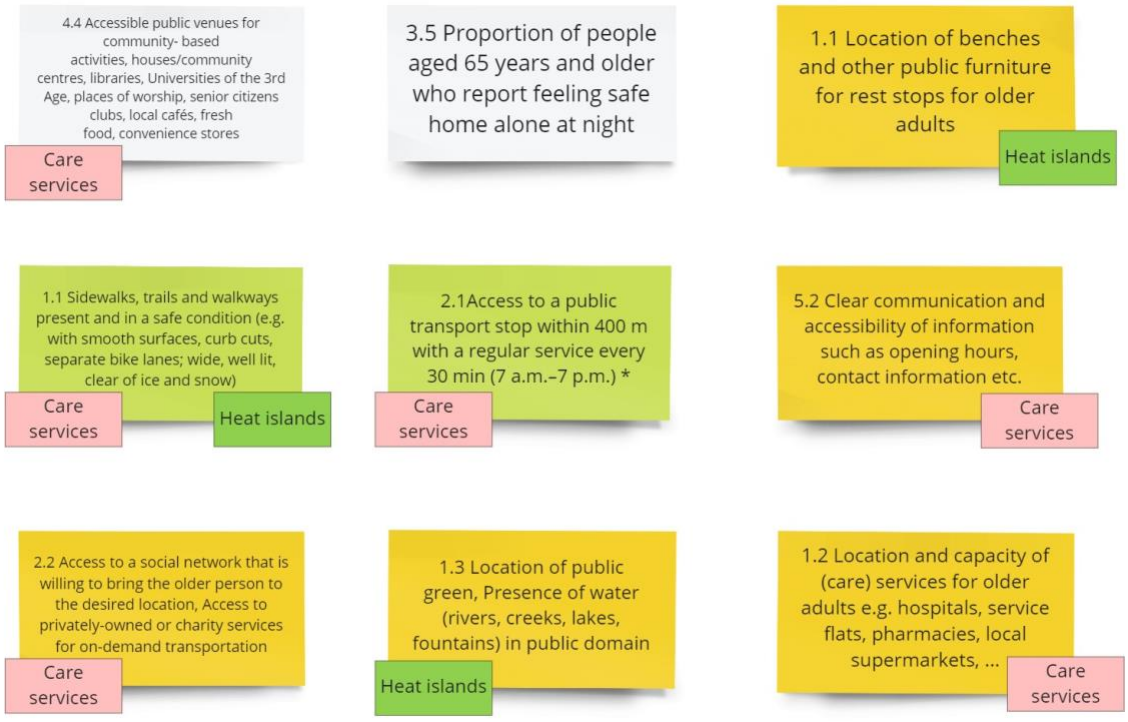

Figure 14 CC2 Screenshot prioritised URBANAGE indicators in Flanders

Table 13 CC2 Relevant URBANAGE indicators and user requirements for Civil Servants Flanders

Use Case	Indicator	Relevance for civil servants	CC1 User Requirements
Care Services	*Accessible public venues for community- based activities, houses/community centres, libraries, Universities of the 3rd Age, places of worship, senior citizens clubs, local cafés, fresh food, convenience stores*	**Public venues are often the start of social networks** (outside families), and therefore are crucial as an opportunity for older adults to participate socially and to stay healthy. Moreover, changing the 'small things' that increase the overall quality of life is at least as important as changes in the health care system (which gets much more attention).	As an OA, I want a service centre (dienstencentrum) close to my home
Care Services	*Access to a public transport stop within 400 m with a regular service every 30 min (7 a.m.–7 p.m.) ****	* Needed because older adults do not have the same action radius as younger (healthy people). Frequency is important, as many more remote locations only get serviced a few times per day, which is not enough when one wants to visit e.g. a partner in a home.	As an OA, I want reliable public transport As an OA, I want easy to access public transport (e.g., bus stops) As an OA, I want easy to access information about public transport
Care Services	*Access to a social network that is willing to bring the older person to the desired location, Access to privately-owned or charity services for on-demand transportation*	* Socially isolated older adults not only feel worse, physically and mentally, but also lose access to an alternate mode of transportation, making them even more reliant on public transport or their own mobility.	As an OA, I would like to have alternative solutions to reach primary services (e.g. doctor, groceries) during extreme weather days
Care Services	*Location and capacity of (care) services for older adults e.g. hospitals, service flats, pharmacies, local supermarkets, ...*	Increased pressure on the availability of care services due to an ageing population + lack of qualitative housing in actual cities (older adults pushed outward, to low-density areas with worse public transport).	As an OA, I expect accessible and available health care services As an OA, I want a **doctor** close by As an OA, I want a **hospital** close by As an OA, I want **shops** close by As an OA, I want a **pharmacy** close by As an OA, I want a **physiotherapist** close by

			As an OA, I want to easily reach homes / **care centres**
Care Services	*Clear communication and accessibility of information such as opening hours, contact information etc.*	* For many public services and buildings, finding information on opening hours etc. is something that requires connectivity (internet) and some digital skills. Older adults, on the other hand, often prefer to call for info, but do not always know where to call. A lot of information today is fragmented and not reported in a standardized, uniform way that is easy to understand. E.g. Ghent has a programme to integrate accessibility info about their 12 city museums into the existing websites of these museums in a standardized way, to make it easier to understand and find.	As an OA, I want one central point of contact for all questions related to services. As an OA, I want my city administration to give me options for feedback/input/questions As an OA, I want my city administration to acknowledge my effort/feedback/input/questions As an OA, I want my city administration to take action based on my effort/feedback/input/questions As an OA, I want my city administration to provide answers to my questions (close feedback loop) As an OA, I want fast communication (direct response, no queues) from my city administration As an OA, I want a single point of contact for all questions related to city services (phone + email) As an OA, I want info related to city services to be up-to-date As an OA, I want visual information to be available on both digital and physical maps As an OA, I want digital information to be complemented by physical carriers (e.g. brochure)

			As an OA, I want to find information on city services in the city newspaper/magazine As an OA, I want to receive relevant information through 3d party services
Care Services **Heat Islands**	*Sidewalks, trails and walkways present and in a safe condition (e.g. with smooth surfaces, curb cuts, separate bike lanes; wide, well lit, clear of ice and snow)*	Important topic that requires a mindset shift in the way we think about urban planning: from car-centric to pedestrian-centric. City of the future in a way should resemble the early 20th century more than late 20th century, by focusing on pedestrians and bicycles. Especially relevant in Ghent (historical centre, cobblestones), where they currently have a cross-departmental project (with a.o. heritage, budgeting and public domain departments) on creating 'comfort zones', also in this hard-to-access city centre.	As an OA, I want **high-quality sidewalks** (even, not too high borders, no loose tiles, no holes, ...) As an OA, I want safe cycling roads that separate fast and slow cyclists As an OA, I do not want **steps** that interfere with the sidewalk As an OA, I want s**afe stairs or ramps** to access places if needed As an OA, I want a safe space to bike, especially In proximity to **heightened sidewalks** (e.g. tram stops)
Heat Islands	*Location of public green, Presence of water (rivers, creeks, lakes, fountains) in public domain*	* Rest stops are not enough to stimulate people to go outside; the perceived quality of the environment is also important to older adults. Elements that go into this quality are e.g. greenery, water, noise levels, safety and social activity, ...	As an OA, I want to be able to walk around or sit in a quiet environment As an OA, I want a clean environment (no litter)
Heat Islands	*Location of benches and other public furniture for rest stops for older adults*	* Older adults have a reduced 'action radius', and require locations where they can (comfortably) sit and rest. These locations do not only require a bench, but ideally also have hand rails and even, hardened surfaces below.	As an OA, I want to have public drinking fountains [on hot days] As an OA, I want to sit at a clean & well-maintained bench (inc. painted) As an OA, I want benches to be located on walking routes, parks, but also shopping streets (rest stops)
Other	*Proportion of people aged 65 years and older who report*	The subjective perception of safety at home is a good indicator of the	N/A

	feeling safe home alone at night	safety perception of a specific street or neighbourhood, which is relevant to motivating older adults to go to certain locations or not.	

Additional comments/remarks related to the domain needs of civil servants:

1. Age-friendly cities need to be easy to navigate independently, and should not require guidance from third parties
2. In Ghent, in some cases, it is not a problem of availability or physical accessibility of infrastructure, it is related to the end users not finding the information about the location of those services:
    a. E.g. accessible public toilets are available, but are not necessarily well-mapped/communicated, or not necessarily in locations which one can easily reach independently as an older adult.
    b. Importance of clear front-end that helps communicate message/information to users
3. Scoring is not necessarily the right tool for providing information: often, it is better to provide users with the facts so that they can make their own decision
    a. E.g. not 'this location has a rating of 9.2' but 'this location provides: shadow, comfortable bench, greenery, low noise levels, ...'
    b. Using scores and recommendations risks imposing a certain 'standard' on people

4.4.2.2.3 Relevant data sources related to the selected indicators

Note: This information was primarily gathered through a separate interview with the Data & Information department of the city of Ghent. Their input can be found on the same picture as the one displayed under 3.3.1 User requirements and URBANAGE indicators*, marked in light green.*

Table 14 CC2 Relevant data sources in Flanders related to the URBANAGE prioritized Indicators

Use Case	Indicator	Relevance for civil servants	Data sources
Care Services	*Accessible public venues for community- based activities, houses/community centres, libraries, Universities of the 3rd Age, places of worship, senior citizens clubs, local cafés, fresh food, convenience stores*	Public venues are often the start of social networks (outside families), and therefore are crucial as an opportunity for older adults to participate socially and to stay healthy. Moreover, changing the 'small things' that increase the overall quality of life is at least as important as changes in the health care system (which gets much more attention).	• Cities are legally obliged to make public spaces accessible, so there must be data • Exception: historical buildings that cannot easily be made accessible
Care Services	*Access to a public transport stop within 400 m with a regular service every 30 min (7*	* Needed because older adults do not have the same action radius as younger (healthy	• Some data available on Flemish level • Open data by De Lijn available,

	*a.m.–7 p.m.) **	people). Frequency is important, as many more remote locations only get serviced a few times per day, which is not enough when one wants to visit e.g. a partner in a home.	but not necessarily reliable • Ghent knows where stops are, but not sure if these have already mapped according to 400m indicator guideline
Care Services	*Access to a social network that is willing to bring the older person to the desired location, Access to privately-owned or charity services for on-demand transportation*	* Socially isolated older adults not only feel worse, physically and mentally, but also lose access to an alternate mode of transportation, making them even more reliant on public transport or their own mobility.	• TriVelo initiative? • Ghent has a voucher for older adults to use taxis, but data is limited
Care Services	*Location and capacity of (care) services for older adults e.g. hospitals, service flats, pharmacies, local supermarkets, ...*	Increased pressure on the availability of care services due to an aging population + lack of qualitative housing in actual cities (older adults pushed outward to low-density areas with worse public transport).	• Care service locations are available as part of the Sociale Kaart (social map) but capacity is not • Capacity data will need to come from first line organizations and is fragmented • Linking location, capacity and accessibility data will be challenging
Care Services	*Clear communication and accessibility of information such as opening hours, contact information etc.*	* For many public services and buildings, finding information on opening hours etc. is something that requires connectivity (internet) and some digital skills. Older adults, on the other hand, often prefer to call for info, but do not always know where to call. A lot of information today is fragmented and not reported in a standardized, uniform way that is easy to understand. E.g. Ghent has program to integrate accessibility info about their 12 city museums into the existing websites of these museums in a standardized way, to make it more easy to understand and find.	• Main challenge is quality of information: can you keep it up-to-date at all times? Keep data updated is expensive and need to be justify by its usage.
Care	*Sidewalks, trails and walkways*	Important topic that requires a	• WIS

Services Heat Islands	*present and in a safe condition (e.g. with smooth surfaces, curb cuts, separate bike lanes; wide, well lit, clear of ice and snow)*	mindset shift in the way we think about urban planning: from car-centric to pedestrian-centric. City of the future in a way should resemble the early 20th century more than late 20th century, by focusing on pedestrians and bicycles. Esp. relevant in Ghent (historical centre, cobblestones), where they currently have a cross-departmental project (with a.o. heritage, budgeting and public domain departments) on creating 'comfort zones', also in this hard-to-access city centre.	(wegeninformatiesysteem) has info on structural issues (e.g. manholes) and classification of roads (e.g. slow roads) • Information on sidewalks is scattered across departments, and different questions related to sidewalks require different data sources (e.g. maintenance vs. bike lanes)
Heat Islands	*Location of public green, Presence of water (rivers, creeks, lakes, fountains) in public domain*	* Rest stops are not enough to stimulate people to go outside; the perceived quality of the environment is also important to older adults. Elements that go into this quality are e.g. greenery, water, noise levels, safety and social activity, ...	• Ambition of Ghent is for every citizen to have access to greenery within 500m, but data are not yet structured (discussions about 'what is green' or 'available' • Water data exists (esp. fountains etc) but is not easy (no API / access to the IT system) • Climate department has some data on greenery (and buildings) as part of existing mapping of heat islands
Heat Islands	*Location of benches and other public furniture for rest stops for older adults*	* Older adults have a reduced 'action radius' and require locations where they can (comfortably) sit and rest. These locations do not only require a bench, but ideally also have handrails and even, hardened surfaces below.	• Bench info exists, but is not easy (no API / access to the IT system)
Heat Islands	*Proportion of people aged 65 years and older who report feeling safe home alone at night*	The subjective perception of safety at home is a good indicator of the safety perception of a specific street or neighbourhood, which is relevant to motivating older adults to go to certain locations or not.	• Demographic data available, updated annually • Stadsmonitor (Ghent) has data on the subjective perception of safety per borough • Monthly crime statistics are available per borough through police for Ghent

Additional comments/remarks related to data needs of civil servants:

1. **Accessibility buildings (wheelchair)** exists, but the data is usually not up-dated. There is also no administrative procedure in place to add this information to a database after construction of a new building has finished.
    a. Ghent experimented with web crawling but the results were not great.
    b. There is a Building Registry (gebouwenregister), but this is incomplete and not yet fully functional + hard to link to other data sources
        i. Information is currently on the level of the allotment and address, but not yet about the actual building
        ii. Can be linked more long-term with a Flemish initiative on building mapping, but not yet available
2. **Falls & injuries in public domain** will be hard to get, as nobody usually reports them
3. **Proportion of older adults who want to remain in their home and can afford it** is not easy to access as data:
    a. Woonstudie has information on distribution of people who live where, but not necessarily about the intent of ageing in the same property.
    b. Social stratification plays a big role here, especially for renting > people who rent are more easily 'forced' out of their homes due to budgetary reasons
        i. Homeowners too may not have the means to renovate their home to make it age-friendly
        ii. Project Gent Knapt Op is part of a European project, and provides homeowners funds for age-friendly home renovations in exchange for a certain percent of the added value of the property upon sale
    c. Data on where people move (from and to) and why is available in Ghent https://hoeveelin.stad.gent/verhuisbewegingen/ in pdf form
4. Social impact of increased age of retirement: assumption is that new older adults will remain active for a longer period, but that also means that the gaps between the haves and have nots (financially, socially, digitally, ...) will become even bigger for this age group than for others
5. **Temperature, heat, shadows**: heat islands are already mapped as part of climate plans but are not necessarily readily available.
    a. Climate department mostly has data on things such as greenery and buildings rather than shadows to calculate 'heat islands'
    b. Ghent has a *3D model for sun/shadows* that is accurate enough to run simulations
    c. Ghent once experimented with a sun simulation model as part of an effort to (re)distribute outdoor terrace space for bars and restaurants
6. **Subjective information** too is important, not just objective data: policy makers often forget to validate if something really has value or not
    a. This subjective information does not necessarily need to be provided by the end user itself; others too can provide this input.

4.4.2.2.4 Models

- Linking **demographic data with physical / environmental** data
  - Considered challenging
- Modelling of **how demographics of certain neighbourhoods will evolve** is very valuable
  - E.g. currently 'young' neighbourhood > what will it be like in 20 years? Based on demographic evolutions and/or how people move
- Not only walkability and accessibility of public spaces, but the **actual usage by older adults of these public spaces**
  - Telco data as proxy for 'use', but cannot link this to demographic. Telecom providers do not have anonymized disaggregated data about the target group

Note: Some potential collaborations with telecom providers can be established to investigate novel ways of obtaining disaggregated data. e.g. aggregating data by phone models --> research shows that older people tend to own old phones models.

4.4.3 Results CC2 Santander

4.4.3.1 Mapping existing initiatives, challenges, collaborations, and key actors

During this part of the workshop civil servants from Santander mapped the existing initiatives, the challenges they are currently facing and finally the collaborations they consider are relevant in addressing the needs of older people in the urban environment. Based on these results we defined the civil servants' main requirements.

Participants listed ten initiatives (see Annex IIi) related to the scope of the URBANAGE project. Two European projects where mentioned (eCare, M-SEC), one about encouraging older citizens to live independently and one related to secure IoT systems. Two projects related to physical accessibility in outdoor and indoor environments. One was related to social services, three to health and wellbeing and four to social participation and socialization. Two projects about technology adoption were also mentioned. When asked to prioritize the most relevant projects civil servant indicated the projects related to accessibility and socialization.

Civil servants identified multiple challenges that can be classified in three categories: physical experience of the urban space, social experience, and technological barriers. This is the list of challenges classified by categories:

Physical experience of the urban space and the different barriers affecting the older people:

- **Absence of public toilets** in some places of the city

- **Shortage of benches** on the streets to rest/stay on
- **Accessibility issues** at **private building** level (no **lifts**)
- **Shortage of public space shelters** in a rainy city
- **Unsuitable types of pavements** (with protrusions, studs, edges) for all types of wheeled users, persons with reduced mobility and older adults in general.
- **Raised floor tiles**, not enough maintenance of some of the pavements
- Complexity of access to the bus (height of access, ticket validation)
- Difficulties in **vertical mobility** (buildings and public space)

Social experience in the urban space:

- **Loss of the proximity commerce**
  - A lack of local commerce, especially in certain neighbourhoods
- Availability of **cinemas and shows** in places **closer to home**
- Proximity to activity centres
- Civic centres and meeting places in the vicinity of the neighbourhood

Technological barriers older people may experience in interacting with public administration and especially with city administration:

- Bringing the older people **closer to technology** through appointments, ATMs and public transport. Citizenship single card current ongoing project.
- **Lack of information in non-digital formats** on activities available for seniors and others.
  - Information points
  - Publication of activities
  - Technology management course
- The need to facilitate dealings with the administration. Need of more empathy.

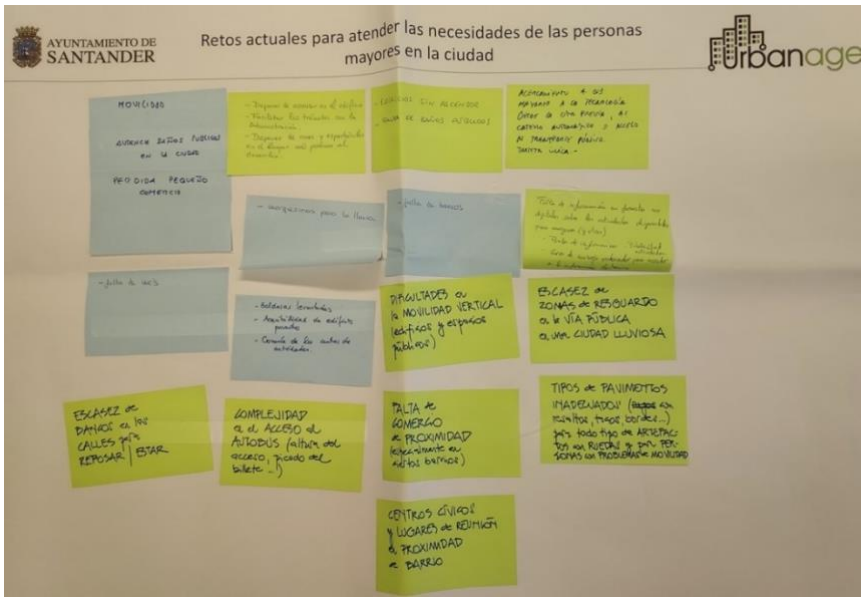

Figure 15 CC2 Main challenges affecting civil servants in Santander

4.4.3.1.1 Collaborations

Among the potential collaborations (see Annex II .ii), each civil servant listed in average two or three departments. The most mentioned departments were the IT (5), road works (4), social services (4), urban planning (3), mobility and transport (3), municipal services (2). When listing the most important departments, participants frequently mentioned the role of the IT and municipal services in bridging the digital world closer to older citizens. Many possibilities of collaboration among different departments /city services were identified.

The importance of cross-departmental collaboration was recognized and a key element in making Santander an age-friendly city because a transversal issue. Despite this awareness, civil servants recognize that the **sharing of information among the different departments does not occur often**, even if some of the city services do collaborate quite frequently, like health and social services. Moreover, the **main challenges at city level differ from department to department and this can be an obstacle** to make the city friendlier for the older people. For example, if there is a traffic light that is too short for the pedestrians, but as the transport department is focused on the improvement of the city mobility (mainly related with car/bus mobility) they don't seem to take that aspect into account as a key issue.

The main identified requirements were:

- **Friendly and accessible city administration procedures and information** for older people, including those who are not as digitally savvy.
- Updated or **real time information about issues in the city facilities** for older people.
- D**etailed information on the needs and ideas of older people,** by establishing fluent channels and adapt for them for participation in municipality governance.

- Make available the **information** gathered in each department in other city departments as **data**.
- C**ommon data treatment system** in all the different services of the municipality.
- F**luent relation with other city departments/services to overcome silos.**

4.4.3.2 From user requirements to data sources and models

4.4.3.2.1 User requirements and URBANAGE indicators

A preselection from the URBANAGE indicators framework was given to the different attendees taking into account their background, they made a first lecture of them, identifying the most important ones for their use case.

4.4.3.2.2 Relevant URBANAGE indicators for use cases

From the needs of the older adults already received in the CC1 in Santander it has also been identified which ones match with the users' requirements.

Table 15 Relevant URBANAGE indicators and user requirements for Civil Servants Santander

Indicator	Relevance for Civil Servants of the most important indicators	CC1
Number of accessible washrooms	The existence of public toilets in the city is essential for older people because it reduces the possibility of walking if you have to depend on the existence of public toilets when you decide where to go.	I want **public restrooms** to be free and widely available throughout the city
		I want to know the **location of public restrooms** throughout the city
Number of rest places and distance between rest places	There is a shortage of benches on the streets to rest/stay on, there is also a shortage of public space shelters in a rainy city like Santander. This point has to be taken into account when the public spaces are designed	I want **more benches** distributed around the city
Sidewalks, trails and walkways present and in a safe condition (e.g. with smooth surfaces, curb cuts, separate bike lanes; wide, well lit, clear of ice and snow)	There are accessibility issues at private building level (no lifts) and in general difficulties in vertical mobility (buildings and public space). A big effort has been done at city level to improve the urban accessibility with the installations of escalators and urban lifts that have had a big acceptance among citizens, more installations are planned.	I am concerned about other **people malignantly pressing the safety button** on **mechanical ramps** to stop the ramps for others
		I want mechanical escalators to be more sanitary

	There is an open discussion about this, there is a need of legislation to regulate the use these "transports" do of the public space.	I want pavements to be **free of electric scooters, skaters and bicycles**
		I am concerned about the **number of electric steps** and their driving behaviour
		I am concerned about the **often-reckless driving behaviour of cyclists**
	There are some unsuitable types of pavements (with protrusions, studs, edges) for all types of wheeled users and persons with reduced mobility. And there is also a problem with the raised floor tiles, not enough maintenance of some of the pavements This must be solved since a stumble can cause not only a health problem but, in many cases, irrecoverable physical impairment.	I want pavements to be **free of slippery spots on rainy days**
		I want **wider bicycle lanes**
Safe crosswalks (e.g. with appropriate crossing times, mid-block crosswalks on long streets, median rest stops, good visibility)	There is a clear need to recover the city for the pedestrians, the city is designed for the car and many measures have to be taken in order to make it suitable for all. The issue of the traffic lights in specific point of the city is already known and has been communicated to the traffic department.	I want **traffic lights to be long enough** for older citizens with reduced mobility to be able to cross within time.
Safe and accessible bus stops/ shelters (e.g. with seating, well lit, covered, snow removed, close to senior's residences)	Complexity of access to the bus (height of access, ticket validation)	I want to feel more **comfortable on public transport**
		I want **bus drivers to be more helpful** and sympathetic towards entering a public bus with a wheelchair
		I want people to have a more **civic behaviour when they have to wait** because the bus has to deploy the ramp for people with mobility issues
Proportion of older people with a special parking permit for older or		I want to have places where people with reduced mobility can more easily get out of

disabled drivers who report that designated priority parking spaces are adequately designed and available		a car without interrupting traffic I want more **public and private car parks**
Information & Communication	There is a need to bring older people closer to technology through appointments, ATMs and public transport. Citizenship single card current ongoing project. There is also the need to cover the lack of information in non-digital formats on activities available for seniors and others. • Information points • Publication of activities • Technology management course There also a clear need to facilitate dealings with the administration. Need of more empathy.	I want to know the location of **public restrooms** throughout the city I want to be informed about new infrastructure (ramps, stairs,) in the city I want to be informed about the **maintenance status** of mechanical ramps and escalators I want a streamlined process to apply for priority parking/reduced mobility card

4.4.3.2.3 Relevant data sources related to the selected URBANAGE Indicators

The participants identified some data sources, or ways to achieve them, that could be relevant to measure the selected indicators.

Table 16 Available data sources in Santander related to the URBANAGE prioritized Indicators

Domain	Indicator	Data source
Outdoor environments	*Proportion of older people who report that their neighbourhood is suitable for walking, including for those who use wheelchairs and other mobility aids*	SURVEYS
	Number of rest places and distance between rest places	GIS
	Number of accessible washrooms	GIS but not sure if it´s available
	Proportion of new and existing public spaces and buildings that are fully accessible by wheelchair	GIS
	Proportion of older people who report that public spaces and buildings in their community are	Surveys

	accessible for all people, including those with limitations in mobility, vision or hearing	
	*Access to public open space within 400 m **	GIS
	Reported rate of crimes (per year) committed against older people	There are databases but not so specific
	Percentage of people aged 55 years and older who feel very safe or safe to walk after dark in their local area	Surveys
	Numbers of falls and other injuries of older people (occurring in public places)	There is register of these events if the police attends.
Transport and mobility	*Proportion of housing within walking distance (500 meters) of a public transportation stop*	TUS (SANTANDER URBAN TRANSPORT) in urban planning, could be calculated
	Proportion of older people who report that public transportation stops are accessible	Can be calculated
	Safe and accessible bus stops/ shelters (e.g., with seating, well lit, covered, snow removed, close to senior's residences)	Can be calculated
	*Access to a public transport stop within 400 m **	Can be calculated
	*Access to a public transport stop within 400 m with a regular service every 30 min (7 a.m.–7 p.m.) **	Can be calculated
	Percentage of time of availability of the urban pedestrian facilities service	A tender was launched for the maintenance of this infrastructure, to gather this information was a requirement of the tender. It has already been contracted.
Housing	*Proportion of housing within walking distance (500 meters) of a public transportation stop*	Administrative data from local transport authority or city planning department
Social participation	*Proportion of older adults among all reported visitors to local cultural facilities and events*	Civic centres' data bases
	Proportion of older people who are members of a self-organized or institutionalized leisure-time physical activity group	Civic centres' data bases
	Proportion of older people who report participating in group physical activities in their leisure time	Neighbourhood observatory
	Accessible public venues for community- based activities (e.g. adapted washrooms, ramp to enter	Neighbourhood observatory

	the building, adequate lightning, temperature control)	
	*Access to neighbourhood houses/community centres **	Neighbourhood observatory
	Access to libraries	Culture service
	Access to Universities of the 3rd Age	UNATE. Culture service
	Access to places of worship	Municipal registry (IBI)
	*Access to social clubs/senior citizens clubs **	Council for the elderly. Altamira
	*Access to local cafés measured by distance **	Neighbourhood observatory/ opening licenses (IAE)
	access to fresh food;	Neighbourhood observatory/ opening licenses (IAE)
	access to convenience stores;	Neighbourhood observatory/ opening licenses (IAE)

Some other comments were done regarding data that could be consulted in housing, although in the previous activity that indicator was not selected:

Table 17 CC2 Complementary data sources in Santander

Indicator	Data source
Availability of affordable multipurpose and ageing in place housing options	Administrative data from department of housing
Proportion of new and existing houses that have wheelchair-accessible entrances (i.e. sufficient width, ramp)	Building permits (but not easy to get)
Availability of programmes for increasing accessibility, safety and adaptability of housing (e.g. hand rails, ramps, smoke detectors)	There is a funding programme with a periodic call for the installation of lifts, could be a good information point.
Proportion of people aged 65 years and older who want to remain in their current residence and are confident they will be able to afford to do so	Surveys
Location and Proportion of government owned dwellings	Information available in the municipal register (IBI)

Finally, a short discussion about the use of data and its availability from the different departments happened:

- Urban planning does not use the data generated by Smart Santander; it is mainly used in traffic issues.
- Police department has a lot of information stored but it's not exploited.
- The municipal housing society has information of how many people has asked for a house and their profiles. There is a municipal social housing stock.
- There are some regional helps for home adaptation.
- The city has a special programme for the monitoring of 100 people living alone.
- There is still a lot of municipal services that manage their data in their own archives (excel, word,)

4.4.3.2.4 Models

There was not much time for the discussion about models, but based on the information that the police department gathers two possible models were identified:

Combine data from the police department with other departments	• Traffic accidents • Roads	To make traffic department aware of the risk for the pedestrians	Identify those places where more accidents with pedestrians occur in order to take measures (crosswalks, traffic lights…)
Combine data from the police department with other departments	• Falls in the urban space • Streets ad urban spaces	To get quality information of the pavement used in the urban space	Identify those places where more accidents with pedestrians occur in order to take measures (change pavement , maintain it…)

Figure 16 CC2 Santander identified models

4.4.3.3 Conclusions and additional remarks

There is a clear interest in learning how from the city administration the civil servant could really make the city a better place to age but there are some barriers that are yet difficult to overcome, like the siloed situation among different departments in most public administrations.

Some city departments have a long and constant relation with older people of the city but those are in charge of social affairs and health. Other departments, such as urban planning, lack that relation, as has been identified in the last participatory process of the revision of the city urban master plan.

Regarding available data, the situation depends on the data, all that data that have relation with Smart Santander could be available, other data does exist but is not gathered, is just stored, so further effort should be done to identify which data could be interesting and then treat it in order to make it usable.

4.5 Conclusion CC2

Among the three pilot sites, civil servants are actively looking for solutions to promote age-friendly cities in a context where their population is getting older, resulting on an increased demand of care services. This is supported by the many initiatives and projects promoted by cities. During the activities of the workshop, three main categories of common needs and challenges where reported: technical, urban and communication.

The first is related to the technical challenges to address the needs of older people in the cities: the lack of availability of data (e.g., accessibility, data about older people needs and preferences), the difficulty of accessing and linking different data streams from different urban scales or departments, and finally the difficulty of filtering extensive data sources to be usable for their decision-making process. The gap between domain expertise ("what is the issue to address?") and data knowledge ("what data do I need to solve the issue?") was also mentioned.

The second is related to the urban environment and the availability of safe and accessible public spaces, public bathrooms, places to rest, public transport, sidewalks, and everyday services. One of the most discussed aspects in all the activities were the sidewalks, the presence of obstacles (e.g. electric scooters, skaters and bicycles, poles) and unsafe pavements. Maintenance was also mentioned as a major challenge when addressing the needs of older citizens. Lifts, electric escalators, and other public infrastructure are often not working. Civil Servants do not have access to real time information of the infrastructure that should be fixed, and older citizens cannot rely on the functioning of the infrastructure when planning their daily activities resulting in limiting their independent movement.

The third is related to the communication channels with older citizens. Civil servants are actively looking for new strategies to collect information from them about their needs and preferences, and to inform them about the different available initiatives and resources. They are also looking for new strategies on how to reach older citizens that are isolated.

Some contextual differences among the pilots were also identified. Weather and topographical conditions were often mentioned in different pilots. In Helsinki, for example, winter conditions pose different challenges for older citizens where icy conditions and lack of non-shadow areas were mentioned. In Santander, the lack of shade areas during the summer has been mentioned. In Santander and Helsinki, the hilly topography was often referred as challenging when creating accessible public spaces. In Flanders, two cities reported different needs related to the urban density and morphology of the cities. In historical areas in Ghent, even when accessibility issues are well known, it is often difficult to adapt existing spaces because of the existing cultural heritage preservation rules. In Roeselare instead, low urban density has derived in car dependency in their inhabitants for reaching essential services.

5 Co-creation 3: user requirements & solution (mixed)

Figure 17 CC3 in Santander (right) and Flanders (left) older citizens together with civil servants

Figure 18 CC3 User journeys in Santander

5.1 Goal

The aim of CC3 is to merge the findings acquired in the previous CC sessions with older adults and public servants. For CC3, it was decided that a useful perspective would be to bring these two groups together in a co-creation session to validate the user requirements older adults formulated in CC1 and negotiate among these user requirements based on the insights of public servants and the related findings obtained in CC2. Moreover, allowing these parties involved to cooperate in this co-creation session allowed for the prioritization of user requirements, accounting for participants' perception of importance and feasibility. In addition, the presence of public servants in this CC workshop contributed towards the identification of potential (technical) constraints & challenges related to the implementation. Finally, older adults were asked on how they would like to give input and receive information about these challenges with specific solution adaptations kept in mind for each pilot site to validate whether current solution ideas are preferable and/or which communication channels they preferred.

5.2 Research questions

The methodology principles supporting CC3 serve to search for an answer to two main research questions:

1) ***For each pilot site, which user requirements should the URBANAGE project solution prioritise to make the most valuable impact towards tackling accessibility issues experienced by older adults?***

To operationalize this main research question, the following sub-questions were formulated:

- *For each pilot site challenge, which user requirements do older adults and public servants deem most important?*

- *For each pilot site challenge, which user requirements do older adults and public servants consider (most) feasible?*

2) ***For each pilot site, how do older adults prefer to give input and receive information about their wants and needs regarding accessibility?***

5.3 Methodology

5.3.1 Participant profiles

Table 18 General information about the CC3 workshop in Helsinki

Date	19/10/2021
Pilot	Helsinki
Co-creation type	Co-Creation workshop with civil servants & older adults
Digital / non-digital	Digital
Recorded	Yes

Table 19 Participant's list to CC3 workshop in Helsinki

Participants		
#	**Name**	**Organization/Profile**
1	Ville Nousiainen	Forum Virium Helsinki
2	Mari Sydänmaa	Forum Virium Helsinki
3	Female, 65+	Senior citizen
4	Female, 65+	Senior citizen
5	Male, 65+	Senior citizen
6	Male, 65+	Senior citizen
7	Female, 65+	Senior citizen
8	Female, 65+	Senior citizen
9	Male, 65+	Senior citizen
10	Outi Paulig	City of Helsinki, Elderly citizen council
11	Auni-Marja Vilavaara	Elderly citizen council
12	Pirkko Linder	City of Helsinki
13	Christoph Fink	University of Helsinki
14	Elias Willberg	University of Helsinki

Table 20 General information about the CC3 workshop in Flanders

Date	20/10/2021
Pilot	Flanders
Co-creation type	Co-Creation workshop with civil servants and older adults

Digital / non-digital	Physical
Recorded	Yes (audio)

Table 21 Participants list to CC3 workshop in Flanders

Participants		
#	**Name**	**Organization/Profile**
1	Mathias Maes	Researcher, IMEC-MICT
2	Sofie De Lancker	Project coordinator, IMEC
3	Lieven Raes	Project coordinator smart cities, AIV
4	Sophie Desimpel	Consultant accessibility, City of Ghent
5	Wendy De Man	Accessibility manager, OCMW/City of Ghent
6	Participant 1 (female, 70+)	Had a hip fracture, limited mobility
7	Participant 2 (male, 70+)	Has a disability, limited mobility
8	Participant 2 (male, 70+)	No special remarks

Table 22 General information about the CC3 workshop in Santander

Date	14/10/2021
Pilot	Santander
Co-creation type	Co-Creation workshop with civil servants and older adults
Digital / non-digital	Physical
Recorded	No

Table 23 Participants list to CC3 workshop in Santander

Participants		
#	**Name**	**Organization/Profile**
1	Silvia Urra	Senior Researcher/ Tecnalia
2	Celia Gilsanz	Innovation Technician/ Santander City Council
3	Juan Echevarría	Innovation Technician / Santander City Council
4	Antonio Bezanilla	Urban Planning Director /Santander City Council
5	Tomás García	Police and IT expert / Santander City Council
6	Female (50+)	With mobility issues
7	Male (65+)	No special remarks
8	Male (80+)	No special remarks
9	Male (70+)	No special remarks
10	Male (70+)	No special remarks

5.3.2 Research protocol

Challenges

Based on the efforts conducted in CC1 and CC2, a number of challenges distinctly related to each pilot site were identified. These challenges older adults face in real life were aligned to fit within the scope of the URBANAGE-project. A selection was made for each pilot site to serve as starting subjects for CC3.

For **Helsinki**, 2 challenges were presented. A first challenge focused on **mobility in the winter season**. Older adults indicated in previous sessions that daily mobility was impeded in winter, for example because of snow piles (partially) blocking pavements. A second challenge put the emphasis on **comfort and safety in certain areas** participants identified in previous sessions. Possible elements that contribute to this are, for instance, the lighting conditions on certain routes, or on a more positive note, a sufficient amount of greenery and resting places.

For **Flanders,** 3 relevant challenges were identified. A first challenge deals with the **accessibility concerning essential (care) services**. The second challenge examines what constitutes a **pleasant outdoor environment** for older adults. Why do they prefer to go to certain outdoor places and choose these over others when looking for some outdoor recreation? Based on the input from CC1, the Flemish pilot subject '*heat stress*' was considered less relevant, and because of this, the pilot was modified to reduce the impact of weather on the use case challenges and focus more on the perceived overall pleasantness of the environment. This is an area of interest that was validated in the CCs. Lastly, a third challenge was added as a bonus dimension, based on the relevance it was assigned in previous CCs. This challenge concerns **social activity**, more specifically **where older adults go to socialize and how they look up information on where they want to go to**.

For **Santander,** 3 challenges emerged from previous sessions. The first challenge concerns **the quality of urban spaces**, as a need for more resting places in certain areas, adequate shelter for weather conditions and a lack of public toilets in certain public spaces were identified. Secondly, **safety in the urban space** was put forward as a main challenge. In particular, feelings of insecurity were pointed out related to fall risk or being run over by an electric step or bicycle. A third challenge concerns **close access to certain services and leisure options**. However, in the Santander CC, the groups were given the choice which challenges they wanted to collaborate on, resulting into this challenge being discarded.

User journeys

The formulated challenges were accompanied by user journey primer descriptions. For example, for the challenge included in the Santander CC concerning safety in urban spaces, the user journey primer was

formulated as followed as *'As an older adult I don't want to have the risk to fall in the urban space because of an inadequate pavement, or not well-maintained floor tiles. I don't want either to feel afraid of being run over by a bike or an electric step.'* In CC3, a public servant was paired with an older adult. These duos would each tackle one of the challenges in the workshop.

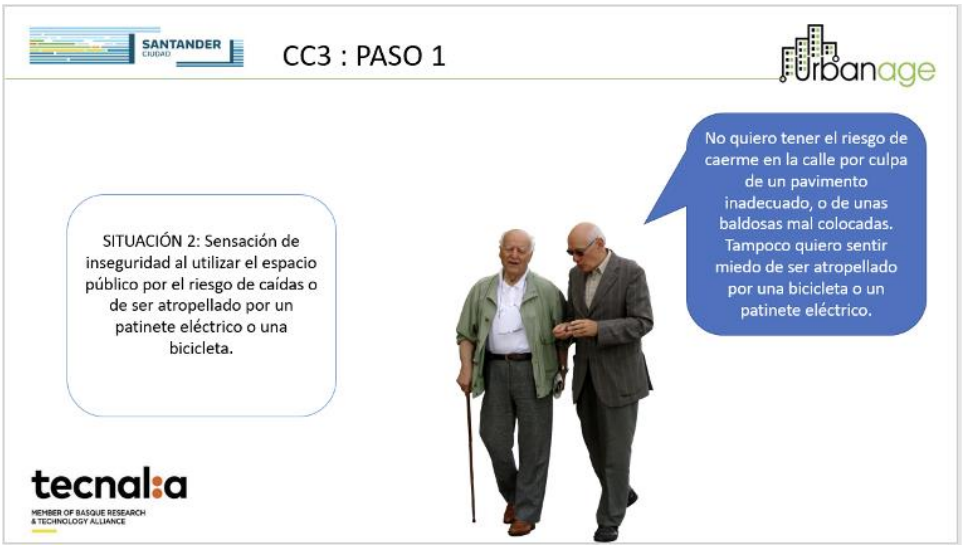

Figure 19 CC3 challenge formulated into user journey theme

Within these user journey descriptions, older adults were encouraged to think of a location they go to - or would go to - within the constraints of the challenge and description. They are then asked to internally visualize the route to this location from their home (or other location they prefer). The duos are given a large sheet on which they can describe the journey of the older adult. On this sheet, they were asked to paste elements they encounter on their respective routes. They were also encouraged to write down any additional comments related to these elements on the sheet. These elements consist of positive and negative factors impacting their journey. These elements were identified in the previous CCs. In total, 10 positive and 9 negative elements were deduced. In Santander, elements were adapted to the specific use case: 5 positive and 6 negative elements were identified. Additionally, a blue element could be used to add an element of choice outside of the scope of the current elements.

Figure 20 CC3 Example user journey sheet (digitalized) Helsinki

The duos were given the time to complete these sheets. After completion, everyone was invited to briefly present their user journey and which elements they chose. This opened discussion with the other duos and presented a chance for the duos to give preliminary feedback on each other's user journey. Further, participants were solicited to fill in a table describing why they found their chosen elements relevant and scoring these elements on a scale of 1 (very unimportant) to 5 (very important).

As a final step, participants were asked to help validate what methods could be deemed viable for conveying information concerning their user wants and needs. Because of the requests of each pilot site, this step differed for each organized CC workshop. In Helsinki, the focus was on the development of an IoT device to be used by older adults, as previous enquiries clarified that requiring a smartphone may exclude users. In Flanders, AIV as a lead for the Flemish pilot decided to focus the additional validation round on two main aspects: how older adults want to receive information related to accessible and pleasant public spaces and if and how older adults are willing to give input and receive information. Secondly, the AIV presented an application UI for a smartphone app to find out how participants perceived the display of information on these prototype screenshots. In Santander, the enquired aspects were similar to those of Flanders, but participants were given a sheet with potential communication channels, both physical and digital, and asked to indicate which ones they would like to receive information by.

To analyze the findings of the CC sessions, the elements and their feedback were translated into a priority list of user requirements by making use of the MoSCoW-method *('must have - should have - could have – won't have')*. The level of importance, frequency of occurrence and the degree of perceived feasibility were considered. Additionally, some user requirements were considered 'won't have' since these issues are deemed outside of the scope of the URBANAGE project.

5.4 Results

In this section, an overview of all prioritized user requirements per pilot site and categorized following MoSCoW-principles is given. Additionally, we also provided the enquiry outcome on how older adults would like to give input and receive information about accessibility issues.

5.4.1 Results CC3 Helsinki

Table 24 CC3 Prioritization user requirements Helsinki

Priority of user requirements
MUST HAVE *As an older adult…* ▪ I want safe and obstacle free pavements ▪ In the winter sufficient maintenance to avoid slippery conditions and snow piles ▪ I want sufficient lighting so that I feel safe and secure ▪ Also, visibility to avoid tripping ▪ I want to be able to meet my friends and relatives in real life ▪ I don't want current services to be replaced with remote events ▪ I want the nature of the local environment to be preserved and cared for. ▪ I want to have enough benches for resting ▪ I want benches close enough together so that I feel safe ▪ I want have benches available and not occupied by drunk people ▪ I want to have temporary pedestrian routes to be safe ▪ I want to have temporary pedestrian routes to be maintained properly at all times of the year ▪ I want to have temporary pedestrian routes to be marked clearly ▪ I want to be aware who is responsible for the maintenance of temporary routes
SHOULD HAVE *As an older adult…* ▪ I want to have signposts maintained often enough ▪ I want to have signposts pointing right directions ▪ I want to have signposts with distances to the destination ▪ I want to have big enough and clear signposts ▪ I want the level of public transport to be at least the current level or better ▪ It is important to have public transport discounts for older people ▪ I want lifts to be designed easier to use for older people with wheelchairs ▪ I want to have reliable information about public transportation timetables at the stations/stops ▪ I want to feel safe around public spaces ▪ I want to be not afraid of drunk people and drug users at metro station and local mall

COULD HAVE N/A
WON'T HAVE N/A
Validation of information needs
Helsinki decided that based upon the feedback of older adults, the development of an IoT device will be continued. Participants pointed out that smartphone requirement may exclude some potential users. Older adults indicated that when given the choice between a virtual version of IoT device or a physical version which you need to carry, most of the participants would like to use the virtual version of the IoT device. Virtual version of IoT device means a version of IoT device which you can use on your smartphone web browser and it has all the same functionalities as the physical version of the device.

5.4.2 Results CC3 Flanders

Table 25 CC3 Prioritization user requirements Flanders

Priority of user requirements
MUST HAVE *As an older adult…* ▪ I want high-quality sidewalks (even, not too high borders, no loose tiles, no holes, ...) ▪ I want obstruction-free sidewalks ▪ I do not want steps that interfere with the sidewalk ▪ I want safe stairs or ramps to access places if needed ▪ I expect accessible and available health care services ▪ I want a doctor close by ▪ I want a hospital close by ▪ I want shops close by ▪ I want a pharmacy close by ▪ I want a physiotherapist close by ▪ I want a service centre close by ▪ I want to easily reach homes / care centres

- I want the public domain to take the needs of people with disabilities into account
- I want visual information to be available on both digital and physical maps
- I want digital information to be complemented by physical carriers (e.g. brochure)
- I want to be able to walk around or sit in a quiet environment
- I want to sit at a clean & well-maintained bench (inc. painted)
- I want benches to be located on walking routes, parks, but also shopping streets (rest stops)
- I want to know where dangerous crossroads and other traffic situations are
- I want (more) crossroads to safely navigate traffic (and increase my general sense of safety)
- I want to feel safe on mixed-use roads (traffic modalities)
- I don't want to be forced to use a car to get somewhere by having adequate public transport, biking or cycling options

SHOULD HAVE

As an older adult…

- I want easy access to public transport (e.g. bus stops)
- I want easy access to information about public transport
- I want safe cycling roads that separate fast and slow cyclists
- I want a safe space to bike, esp. In proximity to heightened sidewalks (e.g. tram stops)
- I want to have public drinking fountains [on hot days]
- I would like to have alternative solutions to reach primary services (e.g. doctor, groceries) during extreme weather days
- I want a clean environment (no litter)

COULD HAVE

As an older adult…

- I want info related to city services to be up to date
- I want my city administration to acknowledge my effort/feedback/input/questions
- I want my city administration to give me options for feedback/input/questions
- I want my city administration to provide answers to my questions (close feedback loop)
- I want my city administration to take action based on my effort/feedback/input/questions

WON'T HAVE

As an older adult…

- I want to use public transport with air conditioning [on hot days]
- I do not want to wait in an exposed location (e.g. at traffic lights) during extreme weather conditions
- I want reliable public transport
- I expect affordable housing (e.g. sociale woning, regular housing that is adapted to needs of OA)
- I want fast communication (direct response, no queues) from my city administration
- I want a single point of contact for all questions related to city services (phone + email)
- I want to find information on city services in the city newspaper/magazine
- I want to receive relevant information through third party services

Validation of information needs
As had become apparent from the earlier sessions (focus groups, CC1), older adults prefer a two-track approach, where digital solutions are supplemented with a traditional, analogue solution. Digital solutions are met with some scepticism and require clear added value. In general, these older adults are already engaged and often call for enquiries (literally, to Ghent Info) and provide feedback to the city on issues. However, they also mentioned feeling 'overly much in demand', and do not like the feeling they sometimes have of being asked for input for things they did not obviously subscribe for. They like to know why their opinion is being asked, and what is being done with this information (corroborating the need for tangible impact which also arose from the focus group sessions).

5.4.3 Results CC3 Santander

Table 26 CC3 Prioritization user requirements Santander

Priority of user requirements
MUST HAVE *As an older adult…* ▪ I want safe, well maintained and well-designed public spaces. ▪ I want public restrooms to be free and widely available throughout the city ▪ I want to know the location of public restrooms throughout the city ▪ I want more benches distributed around the city ▪ I want more public water sources around the city ▪ I want pavements to be free of slippery spots on rainy days ▪ I want pavements to be well maintained without loose tiles ▪ I want traffic lights to be long enough for older citizens with reduced mobility to be able to cross within time ▪ I want in the public space shady areas and areas to protect me from the rain ▪ I want to be informed about new infrastructure (ramps, stairs...) in the city ▪ I want to be informed about the maintenance status of mechanical ramps and escalators ▪ I want to have places where people with reduced mobility can more easily get out of a car without interrupting traffic
SHOULD HAVE *As an older adult…* ▪ I want mechanical escalators to be more sanitary ▪ As an OA I want wider bicycle lanes

- I want pavements to be free of electric scooters, skaters, and bicycles
- As an OA I am concerned about the number of electric steps and their driving behaviour
- As an OA I am concerned about the driving behaviour of cyclists
- I want a streamlined process to apply for priority parking

COULD HAVE

As an older adult…

- I am concerned about other people malignantly pressing the safety button on mechanical ramps to stop the ramps for others.
- I am concerned about the number of electric steps and their driving behaviour
- I am concerned about the driving behaviour of cyclists

WON'T HAVE

As an older adult

- I want to feel more comfortable on public transport
- I want bus drivers to be more helpful and sympathetic towards entering a public bus with a wheelchair.
- I want people to have a more civic behaviour when they have to wait because the bus has to deploy the ramp for people with mobility issues.
- I want more public and private car parks.

Validation of information needs

Older adults indicated that they would like to be informed most about the following issues:

- the accessibility infrastructures,
- public toilets,
- (construction) works in the public space,
- weather issues that may influence in their journeys
- changes in the bus lines due to various reasons

As a traditional method, the TV bus was preferred the most. As a means for digital communication, older adults preferred a specific application for the smartphone or information via WhatsApp.

5.5 Conclusion CC3

The use of the MoSCoW-method allowed for the development of a long list of prioritised user requirements for each pilot site. Although each pilot site has its specific focus and challenges, a level of coherence between the findings communicated by the older people can be distinguished.

For all pilot sites, issues concerning **sidewalks** are strongly prevalent and therefore mostly considered must-haves. Older people indicated issues concerning obstacles, such as snow piles (in Helsinki) or road construction covering parts of the pavement. Secondly, requirements regarding **public safety** were also included, particularly related to reducing fall risk. Lastly, older people emphasized the importance of **maintenance and general cleanliness of sidewalks and public infrastructure** in general. These notions corroborate with the first domain of 'neighbourhood walkability' in the URBANAGE relevant indicators (table 33).

Some of these requirements concerning public safety and maintenance of public infrastructure were also categorized as should-haves, as these requirements were also considered relevant, but less urgent or not as easily implemented. In addition, issues regarding access to public infrastructure, such as public restrooms in Santander or public drinking fountains in Flanders, were also mentioned.

The requirements categorised as could-haves are limited and lack coherence across the pilot sites. For these issues, while they are relevant issues older people are concerned with, they are regarded as simply being less important in comparison to other user requirements by the older people. As a final category, wont-haves were also limited and considered out of the scope of the URBANAGE project and its goals.

On a final note, older people were enquired about how they would like to receive information about the issues they have raised. The specific questions asked regarding this subject differed between pilot sites. Nevertheless, it can be concluded from the findings that older people are not reluctant towards the modern proposed solution, such as an IoT device in Helsinki, or an app in Flanders. Yet, it is important to recognize that older people are not a homogenous group and a large portion of older adults maintain a healthy level of scepticism towards these proposed solutions. In addition, older people still like to have the option to be informed through more traditional channels, such as television in Santander. In conclusion, it is important to recognize that the development of a technological solution within the scope of the URBANAGE project should not neglect the communication of information through more traditional media.

6 Conclusion

The deliverable "**Challenges, User Requirements and Solutions CO-C** " describes the collaborative and inclusive co-creation strategy aimed at better understanding the needs and requirements of end users to achieve age-friendly-cities from an urban planning approach. In order to ensure the long-term applicability of the URBANAGE project and the relevance of its solutions, both end users (policymakers and older adults), have been involved, first separately and then together, in this co-creation process. This document exposes the results of this process.

The description, results and conclusions of each of the co-creation workshops have already been detailed in the previous sections:

- CC1: workshop to identify needs, barriers & challenges of older adults.
- CC2: workshop to identify needs, barriers & challenges of civil servants
- CC3: workshop to define user requirements & solution with older adults and civil servants.

From the first two workshops (CC1 and CC2) it is worth noting that, being the end users from three cities with apparently very different geographic and cultural contexts the results are very similar:

- the results on what older people want and need are very similar, and for all of them the fundamental element of their ideal city is **the need for a safe and physical accessible city**. Their first requirements are about all the issues concerning the sidewalks and **obstacles**; secondly, requirements regarding **public safety**, particularly related to reducing fall risk, in relation with the state of the urban environments or either with the use others make of it (PMV), third the importance of **maintenance and general cleanliness** of sidewalks and public infrastructure in general.
- When we refer to civil servants, they also share similar challenges among cities. The first challenges they face are **technical challenges** to address the needs of older people in the cities: the lack of availability of data, the difficulty of accessing and linking different data streams from different urban scales or departments, and finally the difficulty of filtering extensive data sources to be usable for their decision-making process. The second ones are related to the **urban environment and the availability of safe and accessible public spaces, public transport and everyday services**, how to ensure safe urban environments, how to regulate the use of certain Personal Mobility Vehicles, how to maintain the existing infrastructure? The third is related to the **communication channels with older citizens.** How to collect information from older citizens about their needs and preferences, and to inform them about the different available initiatives and resources?

Of course, local geographical circumstances, climate and weather conditions also show a few differences between the needs and the challenges that older people and civil servants experience in their cities, but the commonalities are more significant.

The co-creation session with older adults and civil servants (CC3) was built upon the results of the previous workshops and prioritized the different requirements resulting from them. A long list of prioritised user requirements for each pilot site with different level of relevance was the outcome of the session.

The resulting list from the co-creation sessions will be confronted with the URBANAGE indicators' framework to ensure that all the relevant requirements are already covered by the already listed indicators, and to include new indicators in case it is needed.

The resulting URBANAGE indicators Framework v02 will lead to the identification of the required data bases at each city level in order to make it possible for the definition of the different case scenarios described in

D6.1. Use Case implementation and validation plan and the corresponding developments in **WP3 Data & Intelligence**, **WP4 URBANAGE Digital Twin** and **WP5 Ecosystem & Integration**.

With the intention to find the ideal tools to achieve older people´s participation in the urban planning processes and to inform them about the events that occur in the urban space, older people were enquired about how they would like to receive communication about the issues they have raised. This information will also give inputs to **WP6 Use Cases** in the definition of the cases in the three cities (Santander, Helsinki and one city in the region of Flanders).

The result of this inquiry was that older people are open to receive communications and interact with the modern proposed solutions, such as an IoT device in Helsinki, or an app in Flanders or Santander but they still would like to have the option to be informed through more traditional channels, such as the television.

These sessions have opened a door for the interaction among older people and civil servants, that are part of departments that have not been historically in touch with this part of the population. The experience has been enriching for both collectives and should path the way to follow up by both end-users, on the one side civil servants have to find the ways and tools to involve and commit older people in the urban planning processes, and on the other side, older people have to be an active and not just a reactive part of the process, asking for their space in the urban planning processes.

7 REFERENCES

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8 Annexes

Annex I CC1 with older citizens (Helsinki, Flanders & Santander)

i - CC1 workshop protocol Helsinki

This annex shows the protocol as it was executed in Helsinki.

Practical aspects

In the URBANAGE project, T2.3 entails the organisation of 3 co-creation workshops in each of the three use-case cities in order to shape the URBANAGE ecosystem and user engagement tools for older adults, but also the policy-related aspects resulting from the use of URBANAGE. This preparation covers the protocol for the first workshop which aims at exploring challenges, user requirements and solutions from the perspective of the older citizen.

[!] The workshops will be tailored to the specific context of each of the 3 cities and the associated use cases. This document describes the approach for Helsinki. The Santander and Flanders preparations will be variations of this protocol.

General approach

- Each workshop is preceded by a one-week period in which participants participate in cultural probe research
- A co-creation workshop (online in Helsinki, physical in Flanders & Santander)
- A meta-workshop in which the workshop moderators and the imec research team process the insights
- Participants
- 8-12 older citizens (this can be the same respondents as T2.2)

Workshop methodology

Cultural probes (one week before CC1)

Goals: Cultural probes will be used as a preparation for the first CC workshop in the URBANAGE project (D2.3). The goal of these probes is to prepare older citizens/participants for this first workshop and make them more aware of issues regarding the use case of Helsinki. This will be done by giving them assignments which they have to fulfil during the week before participating in CC1. The next section provides an overview of instructions and the material that is needed to apply these probes.

Materials required

- Assignment journal (in Finish)
- Clicker counter

Instruction

The older citizens will receive the following probes:

- Assignment journal (see appendix): The respondents receive a 5-day journal that has to be delivered to them at the latest 7 days before CC1. In this journal, assignments are given in combination with one or two questions. The respondent reads the assignment in the evening and fulfils it the day after. The following evening, the participant answers the corresponding question and logs his/her thoughts in the journal.
- Clicker Counter: One of the assignments entails the use of a clicker counter. The respondents are asked to click it when they have a bad experience during the day.

Practicalities

The journal and the clicker need to be handed over to the participants and be collected during the workshop (practical logistics are the responsibility of the workshop moderators in each city). In total a package can be made with the following material:

- Envelope to put the package together:
    - Journal
    - Clicker
    - Second envelope in the package to send the journal back

After the workshop the probes are being stored for later analysis.

CC workshop 1

Goals

- Which needs, challenges, desires & opportunities do older adults experience in urban planning & age-friendly cities (on the long-term)?
- Which needs, challenges, desires & opportunities do older adults experience in relation to the specific use cases (short-term)?
- Which role would older adults be able to play in tackling these challenges (e.g., sharing information)?

Methodology

Introduction (15 min):

Welcome everybody to this co-creation workshop in the URBANAGE-project. In this project we would like to strive towards an age-friendly city in terms of accessibility. To do this, we want to study how older citizens can benefit from a digital twin or place where information is captured from real live settings where they can gather information regarding the accessibility of the neighbourhood. And also, how older citizens can/may contribute to this digital twin. Today we will discuss what needs and desires you as a citizen in your

neighbourhood have, in order to start building this digital twin, so we can use it for your benefit. This seems like a lot and very complex, however, we just want to ask you some questions. The goal is to answer them as honestly as possible. There are no good or bad answers.

To start this session, we will have a little warm-up to make everybody nice and comfortable. We will do this by introducing ourselves by answering the following questions:

- Who am I?
- Why do I participate in this workshop?
- What is an age-friendly city for me?

The moderator points out a senior citizen to start introducing him/herself. After that the participant points out another participant until they all have answered the questions.

The co-moderator takes field notes of specific aspects of the self-described age-friendly cities and puts these on the MIRO-board. If there are elements that are overlapping, the co-moderator immediately clusters these on the provided space in the MIRO-board

Part 1: Long term Use Case (45 min):
Ok thank you for this introduction. Now we all have loosened our tongue, we can begin with the actual workshop. To proceed, we would like to co-shape the future Helsinki. For this, you can take a piece of paper and write in bullets what you think the city should look like in 2035. Be aware that we are only interested in how the neighbourhood should look regarding accessibility. Because this is a pretty open concept, the following topics can help in describing the ideal age-friendly accessible Helsinki:

The moderator shows the dimensions of the “indicator framework” and explains them briefly. (These dimensions are mentioned on the MIRO-board)

Brainwriting (5 min):
Ok, so now you can take 5 minutes to write down on a piece of paper how the “ideal age-friendly accessible” city looks like. Try to involve at least three of the topics that are listed on the screen in your conceptualization. If there are any questions, you can ask them.

The moderator gives the participants 5 minutes to write down the “ideal age-friendly accessible”-city.
[hint: provide some music to make the participants feel at ease during this exercise]

Presentation + discussion (N respondent X 2 min + N respondent X 3 min):
After 5 minutes, the moderator points out a participant that starts with explaining his/her ideal city
Ok, participant x, you can start with explaining how your ideal city looks like. You have two minutes.

During the description, the co-moderator takes notes on the MIRO-board of the elements contributing to the ideal city.

When the participant is done, the moderator asks the following questions:

- Do the other participants agree?
- Are there any remarks of the other participants?
- You have described the ideal city in terms of accessibility, but how do we achieve this according to you? (Other participants can answer this question as well)
- What service offer is needed to achieve this?
- How would you like to receive this service offer?
- Which information do you need in this scenario?
- How would you like to receive this information?
- What role could older citizens play in this scenario?
- How should they participate?
- Should they be able to share information?
- Are there other ways of how they should participate?

When all elements of the participant are discussed, the next participant can share his/her description to the group (using the same protocol).

(Per participant, the moderator provides 2 minutes to share their thoughts to the group and 3 minutes to have a common discussion with the other participants.

Ok, thank you for sharing this. We will take a 5-minute break to go for some coffee and then we will go to the next phase of the workshop.

Break (10min)

Phase 2: Short term use case
Ok, in the second phase of the workshop, we will focus on the assignments you have fulfilled within the last week. In the logbook you have answered a few questions regarding these assignments. We will briefly discuss them in group.

The moderator points out a senior to start sharing their answers which they filled in in the journal. Other older citizens can pick in and share their answers as well. The goal is to have a discussion around every assignment and therefore identify issues which the older citizens experience.

(Note to moderator: Use the assignments as a conversation starter for this phase. The following questions can be asked when discussing the assignments. In the meantime, the co-moderator will identify issues and

take note of these on post-its on the miro-board. While taking notes, the co-moderator also clusters these issues. When some participants have not fulfilled the assignments, you can use a hypothetical approach to ask the same questions. E.g., If you would walk on the street with a clicker, how would you react to clicking it all the time?)

Assignment 1: difficult route

- What are the most problematic areas that you have drawn on your map?
- Why are these the most problematic areas?
- Are these areas also dangerous/risky during other seasons?
- How do you handle these areas?
- What can help you in handling these areas?
- If you could receive information that helps you in handling these areas,
    - What information would you like to receive?
    - In what manner would you like to receive this information?
    - Would you like an app to give you this information?
    - How willing are you to share information you experience yourself regarding these problematic areas?
    - What information would you like to share?
    - How would you like to share this information?
    - Would you like to be kept informed on how the information you shared is processed?

Assignment 2 and 3: often visited places & transportation

- What places did you select?
- Why do you visit these places?
- How do you get to these places?
- Why do you choose these methods of transportation?
- What motivates you to use these methods of transportation?
- What issues do you experience when taking these methods of transportation?
- If you could receive information that helps you to use these methods of transportation,
- What information would you like to receive?
- In what manner would you like to receive this information?
- Would you like an app to give you this information?
- How willing are you to share information you experience yourself regarding these transportation methods?
- What information would you like to share?
- How would you like to share this information?
- Would you like to be kept informed on how the information you shared is processed?

Assignment 4: clicker

You have used the clicker for a day now, we will discuss the use of this clicker.

- How many times did you use the clicker when walking on the streets?
- At what places did you use the clicker?
- Can you describe these places?
- What made these difficult areas in terms of accessibility?
- What issues do you experience in these areas?
- If you could receive information that helps you to make these areas less difficult,
- What information would you like to receive?
- In what manner would you like to receive this information?
- Would you like an app to give you this information?
- Did you use the clicker?
- If yes, did you feel comfortable using the clicker?
- Would you like to use the clicker every day?
- Why (not)?
- If not, why didn't you use the clicker?
- What was holding you back in order to use the clicker?

Assignment 5: service offer

- What issues regarding accessibility did you find the most irritating?
- Did you find a service offer in your neighbourhood that could have helped you in solving these issues?
- If so, how did you find them?
- What kinds of service offer did you find?
- Did they help enough?
- If not, why do you think you didn't find this service offer?
- What was holding you back?
- How willing are you to share information you experience yourself regarding these service offers?
- What information would you like to share?
- How would you like to share this information?

End of the workshop:

To end the workshop, the moderator gives a wrap-up of the points that were discussed during the workshop. After this, the moderator thanks all of the participants.

Expected result of CC1

The result of CC will be filled in in the MIRO-board. During the workshop, the co-moderator will be responsible to take notes on post-its of the needs and issues the participants mentioned during the workshop. This results in a longlist of needs, issues and opportunities.

- Longlist of issues and needs of the older citizens

Meta-workshop CC1

This part of CC1 takes place the day after the workshop with the participants. The goal of this discussion is to translate needs, issues and opportunities of the older citizens into “user requirements''. This will be done by collecting all the needs and issues in a clustered (using the indicator framework) longlist (during CC1 with the participants). In this discussion session, the people who conducted the workshop at the pilot site will present this longlist. In collaboration with the researcher from imec, this longlist will be translated into a longlist of User requirements in a MIRO-board.

Example:

- Issue/ need: An older citizen states that he/she would like to know whether the sidewalks are slippery when they are going to walk a specific route.
- User requirement: As an older citizen I want to know the places that are slippery on a specific route.

ii CC1 workshop assignment journal Santander

This is an example of the CC1 assignment as it was used in Santander.

Assignment 1: Often visited places

Assignment 1: think about 5 Places of Interest in Santander. These are places you visit a lot and/or you like a lot such as parks, but also supermarkets, the beach, restaurants…).
Place 1: ……
Place 2: ……
Place 3: ……
Place 4: ……
Place 5: ……

You may also indicate these places on the map of the previous assignment!

- By which means of transportation do you get there (most of the time)?

……
……
……

- Why do you choose this method of transportation above others?

……
……
……

- Are there other remarks that you would like to share?

……
……
……

Assignment 2: Transportation

Assignment 2: think about the transportation methods you use when you need to go somewhere.
What methods do you use?

Method 1:……
Method 2:……
Method 3:……
Method 4:……

- What helps/motivates you in using these transportation methods?

……
……
……

- What can prevent/demotivate you in using these transportation methods?

……
……
……

- Are there any other remarks that you would like to share?

……
……
……

Assignment 3: Escalators and ramps

Assignment 3: in Santander, there has been a recent investment in escalators and mechanical ramps to accommodate accessibility we would like you to think, when you use these ramps or escalators. We have included a map where these escalators and ramps are implemented. On the next page, an overview of such locations is included.

Which ones of the locations do you use?

Location 1: ……
Location 2: ……
Location 3: ……

- How was your experience with this infrastructure? Did you like it? Was there anything frustrating?

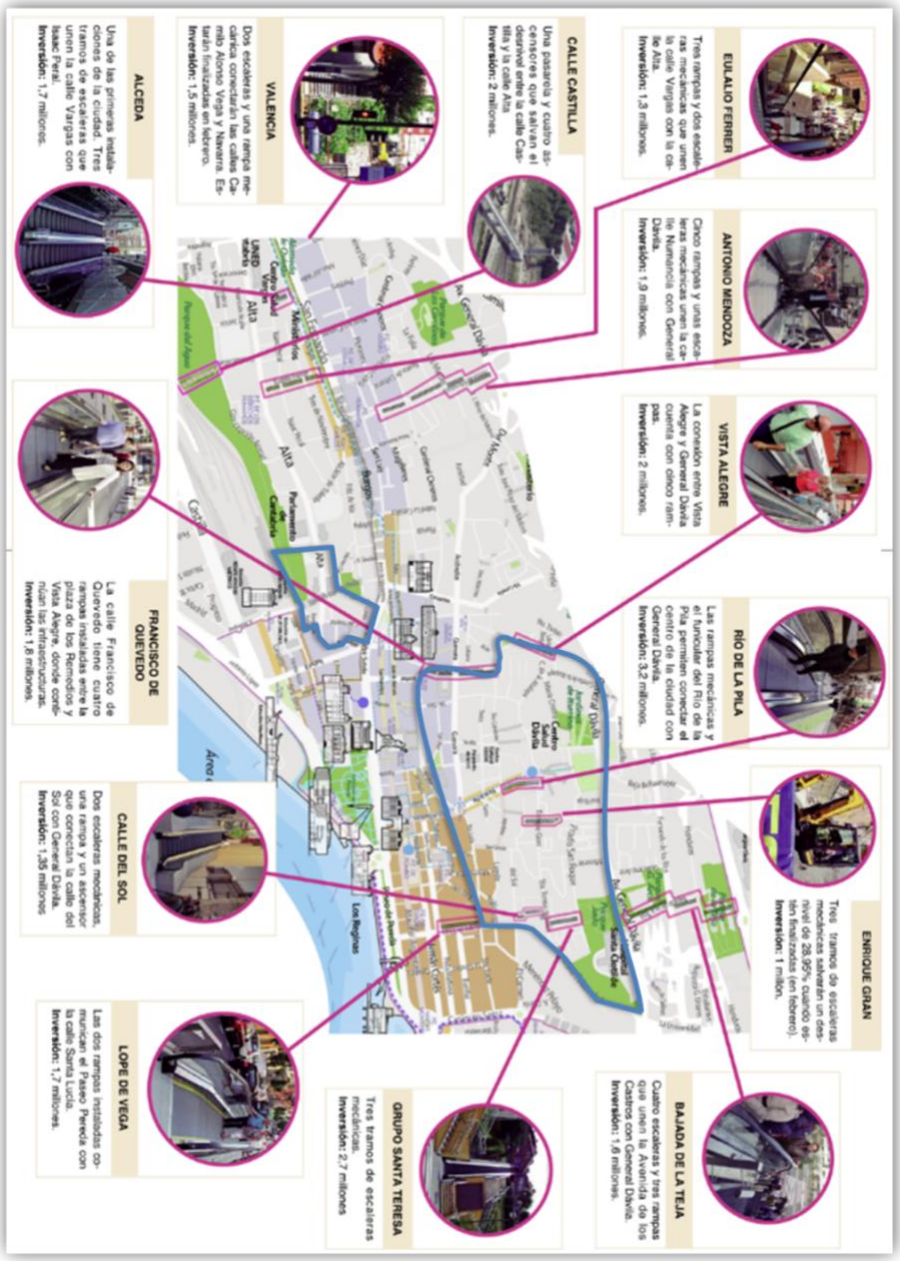
……
……
……

- Can you think of any places where such ramps or escalators would also come in handy?

……
……
……

- Are there any other remarks that you would like to share?

.....
.....
.....



Assignment 4: Difficult route and clicker

Assignment 4: We will now take a route we have predesigned and we will walk outside to take it, bring the clicker counter with you. When you experience something that you don't like, something that hinders your accessibility or is harder to overcome (this can be anything from rough terrain to a bus that is late, for example), use the counter clicker. We will go with you and will reflect in the map when you click.

- What about these areas do you find to be problematic?

……
……
……

- Are there any other remarks that you would like to share?

……
……
……

- How many times did you click the clicker counter? ……

- Describe some of the issues where you clicked the counter (what made the area difficult?)

……
……
……

- Did you feel comfortable using this clicker?

……
……
……

- Are there any other remarks that you would like to share?

……
……
……

Annex II CC2 Long list of civil servants' requirements

i Full list of existing initiatives

Table 27 Existing initiatives in Helsinki

Name Initiative:	**Public spaces accessibility data storage**
Organization or department:	Urban planning
Short description:	Collect all the accessibility data related to all public spaces.
Contact person:	Pirjo Tujula

Table 28 Existing initiatives in Flanders

Name Initiative:	***Proceswandelingen (Ghent)***
Organization or department:	City of Ghent
Short description:	User research / customer journeys to check if services are accessible.
Name Initiative:	***Hello Jenny (Ghent)***
Organization or department:	Project by City of Ghent, District 9, imec
Short description:	Using smart technology to combat loneliness among elderly people by prototyping and testing a smart speaker that asks older adults if they want a visit from a volunteer.
Name Initiative:	***Everyone RSL (Roeselare)***
Organization or department:	City of Roeselare
Short description:	• Platform to connect volunteers to people who have certain needs or demands (e.g., older adults) to help them with fulfilling these needs. • See also: "Gent helpt" for a similar initiative in Ghent.
Name Initiative:	***Accessible Tourist Walks (Ghent)***
Organization or department:	Project by City of Ghent and Tourism Flanders
Short description:	•Inform visitors/tourists about the accessibility of locations for people with special needs. Offered as a digital platform and a physical map that combines different data layers (e.g. accessibility) and different relevant hot spots (related to visiting, lodgings, tours, eating, ...). •The physical map is updated every 6 months, and the data themselves are re-usable for different purposes

Website:	Link here
Name Initiative:	***TriVelo (Ghent)***
Organization or department:	Project by City of Ghent and 11.11.11
Short description:	Bicycle cab service for less mobile older adults
Website:	Link here.
Name Initiative:	***Intergenerational job coaching or homework***
Organization or department:	Project by City of Ghent and Region of Flanders
Short description:	Initiatives where one person (often local) helps someone else (often of foreign origin) with their homework (Uilenspel, Ghent) or finding a job (Duo for a Job, Flanders).
Name Initiative:	***Walks for elderly (Roeselare)***
Organization or department:	City of Roeselare
Short description:	project (still to be started) to start creating walks specifically for older adults, taking into account their needs e.g. places where it is green.
Name Initiative:	***Stadsmonitor (Ghent)***
Organization or department:	Project by City of Ghent
Short description:	Reporting tool (can be accessed digitally on Stad in Cijfers) by the City of Ghent which collects all kinds of data on a borough level (25 boroughs in Ghent). Allows for more targeted decision making by having granularity in results.

Table 29 Existing initiatives in Santander

Name Initiative:	***Promotion of accessibility ********
Short description:	Equipping the city with mechanical mobility systems (ramps and stairs, lifts and cable cars) to improve cross-town communication and vertical communication.
Organization or department:	URBAN DEVELOPMENT / VIALITY
Name Initiative:	***Aid for the installation of lifts***
Short description:	Program of subsidies to communities of owners for the improvement of accessibility, whether it be ramps in doorways or the installation of lifts in buildings that lack them.
Organization or department:	Involved departments: URBAN DEVELOPMENT / URBAN PLANNING
Name Initiative:	***Aids for senior citizens***
Short description:	Telecare, home-delivered meals, home-help service, assistance to homeless people, assistance to people without resources.
Organization or department:	SOCIAL SERVICES

Name Initiative:	***Technology courses / telecentres***
Short description:	Courses adapted to seniors for the use of smartphones, tablets, WhatsApp, emails, etc.
Organization or department:	local development agency
Name Initiative:	***Healthy routes through the bio parks***
Short description:	Through activities coordinated by a physiotherapist, the aim is to stimulate the regular practice of physical activity among the elderly in order to achieve active ageing.
Organization or department:	HEALTH
Name Initiative:	***Programs of activities ******
Short description:	Programming of activities in the civic centres; sports activities (gymnastics, yoga, dance, etc), health activities (memory workshops), computer courses, mobile phone management...
Organization or department:	CITIZEN PARTICIPATION
Name Initiative:	***Urban gardens *****
Short description:	Gardens in the city for older people to encourage exercise, socialization and active living.
	ENVIRONMENT
Name Initiative:	***Short story competition for the over 65s "The value of the lived experience".***
Short description:	This is an annual event open to all residents over this age in Santander to present their memories or life experiences and at the same time to stimulate their social participation.
Organization or department:	HEALTH
Name Initiative:	***eCare***
Short description:	eCare PCP is a European project that aims to encourage elderly people to live independently, detecting and preventing loneliness and isolation, promoting healthy habits and exercise, etc. The objective of eCare is to launch a Pre-Commercial Procurement call for tender to deliver disruptive digital solutions for the prevention and comprehensive management of frailty to encourage independent living, wellbeing and to relieve health and care services budget pressure.
Organization or department:	INNOVATION/SOCIAL SERVICES/HEALTH
Website:	https://ecare-pcp.eu/
Name Initiative:	***M-SEC***
Short description:	European project for the development of secure IoT systems at different levels. Application as a use case in older people care.
Organization or department:	INNOVATION/SOCIAL SERVICES
Website:	https://www.msecproject.eu/

Note: the number of * indicate relevance of the existing initiatives for the URBANAGE according to civil servants.

ii Full list of departments and organizations

Table 30 Helsinki - Departments and organizations that can contribute to the URBANAGE pilot

Department	*Motivation*
Networks	Accessibility studies in networks level, green areas studies
Landscape design	To take into consideration at the design phase
KYMP / MAKA: "landscape & cityscape planning"	they make the planning for parks & squares
KYMP RYA / "implementation department"	they implement the plans
KYMP RYA / "maintenance department"	they maintain the built areas
KUVA "recreational area department"	they plan & maintain some of the public areas (bigger playparks, sports areas)
PUVI "orders the park design documents from consultant"	
LIIKE "traffic department"	
Social services	

Table 31 Flanders - Departments and organizations that can contribute to the URBANAGE pilot

Name	*Type*	*Why*	*Barriers*
Elderly care associations	External	Human-centric design, expertise, participation, 8-80 cities	
Welfare & Healthcare	City Department	Expertise about participation accessibility, equality, ...	
Urban planning & Mobility	City Department	Expertise about public domain, data on public domain, needed for impact/change, are in charge of 'shaping' the city	Not sure if involved
Infrastructure	City Department	Impact/change (making infrastructure accessible)	Not sure if involved
Data & information	City Department	Digital Twin	

Youth	City Department	Quick wins, similar themes & topics, avoid double work	Need to sit together, currently not yet done
Planning	City Department	Need to pay attention to functions in development plans	
(Health) care organizations	External	Expertise and specific services	
Smaller private actors	External	Local retail and shops for data	Too fragmented, no centralization
Supra local government	External	To bring together information from different structures/governments in Belgium	Too fragmented in Belgium

Table 32 Santander - Departments and organizations that can contribute to the URBANAGE pilot

Name of the City Department	*What*
Social Services	Improvement of mobility/accessibility: knowledge of the physical/social, planning and analysis of solutions and locations. material execution and maintenance
Urban Planning	
Promotion	
Engineering	
Social services	Promotion of activities in civic centres/ public spaces/ gardens and urban orchards
Culture	
IT	
Urban planning	
Promotion	
IT	Bringing the digital world closer to older people through accessible applications and training in how to use them.
Health	
Roads	Maintenance and repair of floor tiles
Works	
Engineering	Maintenance of ramps and urban lifts
Roads	
Social services	Accompaniment, training, and errands (volunteer office, intergenerational relations)
Municipal services	
IT	Information about administrative procedures
Sports	

Social services	
Citizen participation	
Municipal register	
Municipal switchboard	
Urban Planning	General design and city planning, barrier removal
Works	Execution of the above works
Transport	Design of routes to cover all neighbourhoods
Mobility	Coordination of actions among other services
Citizen attention	Meeting needs and providing more personalized services
IT	Technological support for all the rest of municipal services.
Urban Planning	Vertical accessibility (lifts, ramps)
Roads	
IT	
Social Services	
Police	
Social Services	Citizen information points
Urban transportation system	

iii Relevant URBANAGE indicators for use cases and user requirements from CC1

Table 33 Helsinki Full list of user requirements from CC1 classified by URBANAGE target topics

Target topic		Indicator	CC1
DOMAIN 1: Outdoor environments	*Neighbourhood walkability*	Number of rest places and distance between rest places	As a User I want to have more places where I can sit down
		Safe crosswalks (e.g. with appropriate crossing times, mid-block crosswalks on long streets, median rest stops, good visibility)	As a user I don't want non-pedestrians to move on the sidewalk.
			As a user I want drivers to respect the stop signs.
		Sidewalks, trails and walkways present and in a safe condition (e.g. with smooth surfaces, curb cuts, separate bike lanes; wide, well lit, clear of ice and snow)	As a user I want a safe pavement to walk during the winter.
			As a user I want to report and get feedback from my city when and where I can encounter obstacles.
			As a user I want my sidewalks to be free of obstacles (snow, ice, no

			sanding, ploughed snow)
		Streets with clear and appropriate street signage and lane markers for walkers and cyclists	As a user I want to have well maintained and up-to-date street signs.
	Public safety	Percentage of people aged 55 years and older who feel very safe or safe to walk after dark in their local area	As a user I want to feel safe, and feel a sense of ownership, in public space by not being exposed to drug users and drug dealers.
			As a user I want to know who I should report to when I don't feel safe in a place.
		Numbers of falls and other injuries of older people (occurring in public places)	As a user I want a safe pavement to walk during the winter.
	Accessibility of public spaces and buildings	Location and capacity of (care) services for older adults e.g. hospitals, service flats, pharmacies, local supermarkets, ...	As a User I want to know degree of occupancy in the health centres and the location of these centres.
			As a User I want convenient access to the services I use in my everyday life, at a reasonable travel time/distance
	Greenery & Water	Maintenance data greenery	As a user I want to like the trees to be properly maintained to allow the light to pass.
	Temperature & climate	Light areas	As a user I want to know where the sunny areas are.
DOMAIN 2: Transport and mobility	*Accessibility of public transportation stops*	Access to a public transport stop within 400 m with a regular service every 30 min (7 a.m.–7 p.m.) *	As a user I want good public transportation that comes frequent, also during the night time.
		Safe and accessible bus stops/ shelters (e.g. with seating, well lit, covered, snow removed, close to senior's residences)	As a user I want a safe infrastructure to use the buses.
		Bike friendly Public transport	As a User I want to be able to take my bike in the public transport
DOMAIN 3: Housing	*Ability to age in place*	Proportion of people aged 65 years and older who want to remain in their current residence and are confident they will be able to afford to do so	As a User I am concerned about my future needs as an older citizen.
	Accessibility of housing	Proportion of older people who report that their house is adapted, or can be adapted, to their needs to facilitate ageing at home	As a User I am concerned about my future needs as an older citizen.
DOMAIN 4: Social participation	*Engagement in sociocultural*	Proportion of older adults among all reported visitors to local cultural	As a User I want to have more services feel less lonely by: By

	activity Participation in leisure- time physical activity in a group	facilities and events Proportion of older people who are members of a self-organized or institutionalized leisure-time physical activity group Proportion of older people who report participating in group physical activities in their leisure time	helping in doing more sports, By helping older people to find a home to stay., By activating the not-activate people in the local community
			As a User I want more sport facilities for elderly people.
			As a User I want service centres (activities, sports, social interaction, affordable meals etc.)
	Participation and representation	Participation in decision making and representation	As a User I want to participate in the decision making of my city, more particular regarding my needs as older people. (As a User I am concerned about my future needs as an older citizen)
			As a User I want to participate by: being informed, Having face to face workshops, Filling in questionnaires, By interview through the phone
			As a User I want to test the final device that I will be using to report data.
DOMAIN 7. Communication and information	*Information availability*	Clear communication and accessibility of information such as opening hours, contact information etc.	As a User I am concerned about real estate developments in my neighbourhood in particular about the forests, the growth of population and the implications regarding this.
			As a User I want to be informed about the obstacles I come along during a walk
			As a User I want to know be informed about the services provided by the city.
			As a User I want to be informed about the city plan to address the needs of growing older populations.
	Digital skills	Proportion of older adults who are digitally savvy	As a User I want a simple interface that does not require many inputs.
			As a user I want to report and get feedback from my city when and where I can encounter obstacles.
			As a User I want to test the final device that I will be using to report data.

Table 34 Flanders full list of user requirements from CC1 classified by URBANAGE target topics

Domain	Target topic	Indicator	CC1 User Requirement
DOMAIN 1: Outdoor environments	*Neighbourhood walkability*	Sidewalks, trails, and walkways present and in a safe condition (E.g., with smooth surfaces, curb cuts, separate bike lanes; wide, well lit, clear of ice and snow)	As an OA, I want high-quality sidewalks (even, not too high borders, no loose tiles, no holes, ...) As an OA, I want safe cycling roads that separate fast and slow cyclists As an OA, I do not want steps that interfere with the sidewalk As an OA, I want safe stairs or ramps to access places if needed As an OA, I want a safe space to bike, esp. In proximity to heightened sidewalks (e.g. tram stops)
		* Number of slow roads on or around specific locations, Holes and other obstacles related to the public domain	As an OA, I want obstruction-free sidewalks
		* Location of benches and other public furniture for rest stops for older adults	As an OA, I want to have public drinking fountains [on hot days] As an OA, I want to sit at a clean & well-maintained bench (inc. painted) As an OA, I want benches to be located on walking routes, parks, but also shopping streets (rest stops)
	Public safety	Percentage of people aged 55 years and older who feel very safe or safe to walk after dark in their local area	
		Numbers of falls and other injuries of older people (occurring in public places)	As an OA, I want to feel safe on mixed-use roads (traffic modalities)

			As an OA, I want to know where dangerous crossroads and other traffic situations are As an OA, I want crossroads to safely cross the road (and increase my general sense of safety in traffic)
	Accessibility of public spaces and buildings	Proportion of new and existing public spaces and buildings that are fully accessible by wheelchair	As an OA, I want the public domain to take the needs of people with disabilities into account
		* Location and capacity of (care) services for older adults e.g. hospitals, service flats, pharmacies, local supermarkets, ...	As an OA, I expect accessible and available health care services As an OA, I expect accessible and available health care services As an OA, I want a doctor close by As an OA, I want a hospital close by As an OA, I want shops close by As an OA, I want a pharmacy close by As an OA, I want a physiotherapist close by As an OA, I want to easily reach homes / care centres
	Greenery & Water	* Location of public green, Presence of water (rivers, creeks, lakes, fountains) in public domain	As an OA, I want to be able to walk around or sit in a quiet environment As an OA, I want a clean environment (no litter)
	Temperature & climate	* Sun, shadows, temperate	As an OA, I want to use public transport with air conditioning [on hot days] As an OA, I do not want to wait in an exposed location (e.g. at traffic lights) during extreme weather conditions

DOMAIN 2: Transport and mobility	*Accessibility of public transportation stops*	Access to a public transport stop within 400 m with a regular service every 30 min (7 a.m.–7 p.m.) *	As an OA, I want reliable public transport As an OA, I want easy to access public transport (e.g. bus stops) As an OA, I want easy to access information about public transport
		*Affordability of public transport to an older population (retirement funds/pension)	As an OA, I don't want to be forced to use a car to get somewhere by having adequate public transport, biking or cycling options
	Accessibility of volunteer/charity forms of transportation	*Access to a social network that is willing to bring the older person to the desired location, Access to privately-owned or charity services for on-demand transportation	As an OA, I would like to have alternative solutions to reach primary services (e.g. doctor, groceries) during extreme weather days
DOMAIN 3: Housing	*Ability to age in place*	Proportion of people aged 65 years and older who want to remain in their current residence and are confident they will be able to afford to do so	As an OA, I expect affordable housing (e.g. sociale woning, regular housing that is adapted to needs of OA)
	Safety at home	Proportion of people aged 65 years and older who report feeling safe home alone at night	
DOMAIN 4: Social participation	*Accessibility of Participation and representation*	Accessible public venues for community- based activities, houses/community centres, libraries, Universities of the 3rd Age, places of worship, senior citizens clubs, local cafés, fresh food, convenience stores	As an OA, I want a service centre (dienstencentrum) close by
	Extra indicator: retirement	*Social impact of the increasing age of retirement*	
DOMAIN 7. Communication and information	*Information availability*	* Clear communication and accessibility of information such as opening hours, contact information etc.	As an OA, I want one central point of contact for all questions related to services.
			As an OA, I want my city administration to give me options for feedback/input/questions

			As an OA, I want my city administration to acknowledge my effort/feedback/input/questions As an OA, I want my city administration to take action based on my effort/feedback/input/questions As an OA, I want my city administration to provide answers to my questions (close feedback loop) As an OA, I want fast communication (direct response, no queues) from my city administration As an OA, I want a single point of contact for all questions related to city services (phone + email) As an OA, I want info related to city services to be up-to-date As an OA, I want visual information to be available on both digital and physical maps As an OA, I want digital information to be complemented by physical carriers (e.g. brochure) As an OA, I want to find information on city services in the city newspaper/magazine As an OA, I want to receive relevant information through 3d party services

Table 35 Santander Full list of user requirements from CC1 classified by URBANAGE target topics

Domain	Target topic	Indicator	CC1
DOMAIN 1: Outdoor environments	Neighbourhood walkability	Proportion of older people who report that their neighbourhood is suitable for walking, including for those who use wheelchairs and other mobility aids	I want cleaner ramps and escalators I am concerned about the often-reckless driving behaviour of cyclists
		Number of rest places and distance between rest places	I want more benches distributed around the city
		Number of accessible washrooms	I want public restrooms to be free and widely available throughout the city I want to know the location of public restrooms throughout the city
		Safe crosswalks (e.g. with appropriate crossing times, mid-block crosswalks on long streets, median rest stops, good visibility)	I want traffic lights to be long enough for older citizens with reduced mobility to be able to cross within time.
		Sidewalks, trails and walkways present and in a safe condition (e.g. with smooth surfaces, curb cuts, separate bike lanes; wide, well lit, clear of ice and snow)	I am concerned about other people malignantly pressing the safety button on mechanical ramps to stop the ramps for others I want mechanical escalators to be more sanitary I want pavements to be free of electric scooters, skaters and bicycles I am concerned about the number of electric steps and their driving behaviour I am concerned about the often-reckless driving behaviour of cyclists I want pavements to be free of slippery spots on rainy days I want wider bicycle lanes

		Walkability for transport (with and without footpaths) *	
	Accessibility of public spaces and buildings	Proportion of new and existing public spaces and buildings that are fully accessible by wheelchair	
		Proportion of older people who report that public spaces and buildings in their community are accessible for all people, including those with limitations in mobility, vision or hearing	
		Access to public open space within 400 m *	
	Public safety	Reported rate of crimes (per year) committed against older people	
		Percentage of people aged 55 years and older who feel very safe or safe to walk after dark in their local area	
		Numbers of falls and other injuries of older people (occurring in public places)	
DOMAIN 2: Transport and mobility	Accessibility of public transportation stops	Proportion of housing within walking distance (500 metres) of a public transportation stop	
		Proportion of older people who report that public transportation stops are accessible	
		Safe and accessible bus stops/ shelters (e.g. with seating, well lit, covered, snow removed, close to senior's residences)	I want to feel more comfortable on public transport I want bus drivers to be more helpful and sympathetic towards entering a public bus with a wheelchair I want people to have a more civic behaviour when they have to wait because the bus has to deploy the ramp for people with mobility issues

		Access to a public transport stop within 400 m *	
		Access to a public transport stop within 400 m with a regular service every 30 min (7 a.m.–7 p.m.) *	
	Accessibility of priority vehicle parking	Proportion of priority parking spaces at new and existing public facilities designated for older people or people with disabilities	I want to have places where people with reduced mobility can more easily get out of a car without interrupting traffic I want more public and private car parks
		Proportion of older people with a special parking permit for older or disabled drivers who report that designated priority parking spaces are adequately designed and available	
	Urban accessibility solutions	Percentage of time of availability of the urban pedestrian facilities service	I want to be informed about new infrastructure (ramps, stairs,) in the city I want to be informed about the maintenance status of mechanical ramps and escalators I want cleaner ramps and escalators I am concerned about other people malignantly pressing the safety button on mechanical ramps to stop the ramps for others I want mechanical escalators to be more sanitary
DOMAIN 3: Housing	Availability and affordability of housing	Proportion of housing within walking distance (500 metres) of a public transportation stop	
		Proportion of older people who report that public transportation stops are accessible	
	Accessibility of housing	Proportion of older people who report that their house is	

		adapted, or can be adapted, to their needs to facilitate ageing at home	
DOMAIN 4: Social participation	Engagement in sociocultural activity	Proportion of older adults among all reported visitors to local cultural facilities and events	I want to use digital channels to be informed of activities or to report incidents on the street myself
	Participation in leisure-time physical activity in a group	Proportion of older people who are members of a self-organized or institutionalized leisure-time physical activity group	
		Proportion of older people who report participating in group physical activities in their leisure time	
	Accessibility of participation opportunities	Accessible public venues for community- based activities (e.g. adapted washrooms, ramp to enter the building, adequate lightning, temperature control)	
		Access to neighbourhood houses/community centres *	
		Access to libraries	
		Access to Universities of the 3rd Age	
		Access to places of worship	
		Access to social clubs/senior citizens clubs *	
		Access to local cafés measured by distance	
		Access to fresh food	
		Access to convenience stores	
DOMAIN 7. Communication and information	Information availability		I want to know the location of public restrooms throughout the city I want to be informed about new infrastructure (ramps, stairs,) in the city I want to be informed about the maintenance status of mechanical ramps and

			escalators I want to be informed of the state of the infrastructures such as ramps, escalators etc. to be used or not before leaving home I want a streamlined process to apply for priority parking/reduced mobility card