INCLUSION Project

Deliverable 6.1

Business concepts and models to support accessible and inclusive mobility

Author(s): Steve Wright (UNIABDN); Lidia Sala and Alvaro Garcia (MOSAIC)

The sole responsibility for the content of this document lies with the authors. It does not necessarily reflect the opinion of the European Union. Neither the INEA nor the European Commission are responsible for any use that may be made of the information contained therein.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

Document Control Page

Title	Business concepts and models to support accessible and inclusive mobility
Editor	UNIABDN
Contributors	UNIABDN, MOSAIC, MEMEX, ALGOWATT
Nature	R
Dissemination Level	PU
Version Number	1.0
Planned Delivery Date	M33
Version Date	28th July 2020
Brief Description	WP6 frames the lessons learnt within the INCLUSION project and derives transferable solutions as regards technological, social and organisational innovation and their combination into effective, efficient and affordable mobility solutions with viable socio-business models (i.e. models not only economically, but also socially, acceptable and sustainable). This deliverable presents the identification of candidate business concepts and the development of related scenarios and business model solutions to support accessible and inclusive mobility in prioritised areas.

Version	Date	Modified by	Comments
0.1	26th May 2020	UNIABDN + MOSAIC	First draft prepared by UNIABDN and MOSAIC with BM canvas inputs from PL partners
0.11	5th June 2020	ALGOWATT, MEMEX, RUPPRECHT	Review by WP6 partners ALGOWATT, MEMEX, RUPPRECHT
0.2	18th June 2020	UNIABDN + MOSAIC	Second draft prepared by UNIABDN and MOSAIC
0.3	3rd July 2020	MOSAIC	Social Demographic Barriers assessment added
0.4	7th July 2020	UNIABDN	Review and update
0.5	8th July 2020	ALGOWATT, RUPPRECHT	Version for peer review
0.6	24th July 2020	UNIABDN	Version for final quality review
1.0	28th July 2020	ALGOWATT	Quality review. Final version

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

Contents

Glossary....6
1 Executive Summary....7
2 Introduction to the INCLUSION Business Models work package....8
3 Methodology....10
4 Establishing the Business Concepts....11
4.1 Identifying what is needed: User needs and mobility gaps....11
4.2 Inclusivity Goals....16
4.3 How do we deliver what is needed?....21
5 Scenarios and Business Model descriptions....26
5.1 Scenarios development....26
5.2 Business Concept 1(BC1) - Accessible Vehicles Strategy....31
5.2.1 Example Business Model solution for BC1_BS1: All public transport bus services to be fully accessible....31
BM Canvas Table....32
5.3 Business Concept 2(BC2) - Exploit the Power of Crowdsourced Data....36
5.3.1 Example Business Model solution for BC2_Scenario1: Crowdsourced data capture to identify where improvements to PT services are needed....36
BM Canvas Table....37
5.3.2 Example Business Model solution for BC2_Scenario 2: Big data analysis to better identify where demand for transport services exists....40
BM Canvas Table....41
5.4 Business Concept 3 (BC3) - Asset sharing models....43
5.4.1 Example Business Model solution for BC3_Scenario 1: Asset sharing in rural or peri-urban areas where the users of the asset are individual members of the public....44
BM Canvas Table....45
5.4.2 Example Business Model solution for BC3_Scenario 2: Asset sharing of buses where the users of the asset are organisations providing a service for members of the public....48
BM Canvas Table....50
5.5 Business Concept 4 (BC4) - Expand Ride-Sharing....54
5.5.1 Example Business Model solution for BC4_Scenario 1: Public-private partnership ridesharing services using shared taxis....54
BM Canvas Table....55

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

5.5.2 Example Business Model solution for BC4_Scenario 2: Peer-to-peer ridesharing services 58

BM Canvas Table 59

5.6 Business Concept 5 (BC5) – Encourage new collective transport services 62

5.6.1 Example Business Model solution for BC5_Scenario 1: Commercially viable collective transport services that better meet vulnerable user demands 62

BM Canvas Table 63

5.6.2 Example Business Model solution for BC5_Scenario 2: Not-for-profit collective transport services that better meet vulnerable user demands in rural areas 66

BM Canvas Table 67

5.7 Business Concept 6 (BC6) - Discount payments through MaaS 71

5.7.1 Example Business Model solution for BC6_S1: New forms of subsidised travel through MaaS systems 71

BM Canvas Table 72

5.8 Business Concept 7 (BC7) - Provide Training and Assistance 76

5.8.1 Example Business Model solution for BC7_Scenario 1: providing staff awareness training to increase confidence and safety in using public transport services 76

BM Canvas Table 77

5.8.2 Example Business Model solution for BC7_Scenario 2: Providing travel assistants to enable use of public transport services 80

BM Canvas Table 81

5.9 Business Concept 8 (BC8) - Tailored Information 84

5.9.1 Example Business Model solution for BC8_Scenario 1: Tailored information (visual or audio) to raise awareness of options available or provide journey assistance 84

BM Canvas Table 85

5.9.2 Example Business Model solution for BC8_Scenario 2: Tailored mobile applications to reduce information barriers thereby increasing uptake and usability 87

BM Canvas Table 89

6 Conclusions 92

Appendix A -Expanded Scenario Descriptions 94

BC1_Scenario 1: All public transport bus services to be fully accessible 94

BC2_Scenario1: Crowdsourced data capture to identify where improvements to PT services are needed 96

BC2_Scenario 2: Big data analysis to better identify where demand for transport services exists 98

BC3_Scenario 1: Asset sharing in rural or peri-urban areas where the users of the asset are individual members of the public 100

BC3_Scenario 2: Asset sharing of buses where the users of the asset are organisations providing a service for members of the public 103
BC4_Scenario 1: Public-private partnership ridesharing services using shared taxis 105
BC4_Scenario 2: Peer-to-peer ridesharing services 107
BC5_Scenario 2: Not-for-profit collective transport services that better meet vulnerable user demands in rural areas 109
BC6_S1: New forms of subsidised travel through MaaS systems 111
BC7_Scenario 1: providing staff awareness training to increase confidence and safety in using public transport services 113
BC7_Scenario 2: Providing travel assistants to enable use of public transport services 115
BC8_Scenario 1: Tailored information (visual or audio) to raise awareness of options available or provide journey assistance 116
BC8_Scenario 2: Tailored mobile applications to reduce information barriers thereby increasing uptake and usability 117
Appendix B – List of Social and Demographic factors 119

List of figures

Figure 1 WP interrelations 9
Figure 2 WP6 road map schema 10
Figure 3 Venn diagram illustration of vulnerable user categories 12
Figure 4 Key priorities for public sector promotion, support and investment for inclusive mobility 22
Figure 5 Illustration of the three rings representing public sector priorities, business concepts, and inclusivity goals 24
Figure 6 Illustrating the steps developing business concepts to business scenarios to business models 26
Figure 7 Illustration of the business concepts and associated business scenarios 30

List of tables

Table 1 List of the 8 Business Concepts and the Inclusivity Goals addressed by each 25
Table 2: Summary of business concepts and list of business scenarios associated with each 27

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

Glossary

- API – Application Programming Interface
- ATAF – Metropolitan Transport Authority of Florence
- AV – Audio Visual
- BC – Business Concept
- BKK - Budapesti Közlekedési Központ (Budapest Transport Centre) the transport operator in the city of Budapest
- BM – Business Model
- BMR - Barcelona Metropolitan Region
- CNP - Cairngorms National Park
- EEA – European Economic Area
- GDPR - General Data Protection Regulation
- ICT - Information and Communication Technology
- INCLUSION - Towards more accessIble and iNCLUSIve mObility solutions for EuropeaN prioritised areas
- LGBTQ+ - Lesbian, gay, bisexual, and transgender
- LMS - Less Mobile Stations
- MaaS - Mobility as a Service
- NFP – Not-for-profit
- NGO – Non-Governmental Organisation (non-profit organization that operates independently of any government
- PA - Prioritised Area
- PL - Pilot Lab
- PT - Public Transport
- SUMP – Sustainable Urban Mobility Plan
- UNIABDN - University of Aberdeen
- VAT – Value Added Tax
- VRS - Verkehrsverbund Rhein-Sieg
- VU - Vulnerable User
- WP - Work Package

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

1 Executive Summary

As set forth in the project proposal, the INCLUSION (Towards more accessIble and iNCLUSIve mObility solutions for EuropeaN prioritised areas) project aims to "...understand, assess and evaluate the accessibility and inclusiveness of transport solutions in European prioritised areas, to identify gaps and unmet needs, propose and experiment with a range of innovative and transferable solutions, including ICT (Information and Communication Technology)-enabled elements, ensuring accessible, inclusive and equitable conditions for all and especially vulnerable user categories." As part of this remit a number of innovative solutions have been developed and implemented through real-life experiments in the project pilot sites (in Belgium, Germany, Hungary, Italy, Spain, and the UK) within Work Package 4. Work Package 5 has undertaken a quantitative assessment of the impacts and a qualitative process evaluation of the innovative transport solutions implemented in the INCLUSION pilot sites. Work Package 6 then develops business concepts and related business models for delivery of effective solutions.

Within this Deliverable, 14 different business models (BMs) have been identified and developed based on 8 business concepts to support accessible and inclusive mobility. Each business model relates to a particular type of solution and provides a detailed description of the key information concerning: main market targets; value proposition; actors involved; communication / engagement strategies; identification of costs and revenue including funding mechanism; the activities required for setup and delivery, etc. Each BM has been developed following a common template developed by the consortium partners.

The set of 14 business models provides a holistic package of solutions for accessible, inclusive and equitable mobility in prioritised areas. Some business models have strong dependency on others and should be delivered as a combined solution. Others complement each other and, although they can be delivered as stand-alone solutions, they can become more effective and benefit a greater number of vulnerable users through combined delivery. These synergies and dependencies have been identified in the business model descriptions. Opportunities and challenges associated with each business model are identified including a specific focus on social factors experienced by different demographic groups of the population that can present as significant barriers to the adoption and uptake of certain business model solutions. This feeds into the next phase of the work, to be reported in Deliverable 6.2, which is to undertake a transferability assessment on the most promising business models, resulting in concrete recommendations of solutions and their associated business models that are effective in enhancing accessible and inclusive mobility for vulnerable users in prioritised areas.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

2 Introduction to the INCLUSION Business Models work package

The main objectives of the INCLUSION project are to understand, assess and evaluate the accessibility and inclusiveness of transport solutions in European prioritised areas1, to identify gaps and unmet needs, propose and pilot a range of innovative and transferable solutions (including ICT-enabled elements), and to ensure accessible, inclusive and equitable conditions for all and especially vulnerable user categories. The project addresses these objectives through a series of Work Packages (WP) as illustrated in Figure 1. WP1 involves investigating the current conditions across a representative set of European prioritised areas and understanding the relevant needs of various vulnerable user and social groups, while WP2 assessed how novel transport solutions involving social innovation and ICT tools can help raise the level of accessibility, inclusiveness and equity of mobility in the reference areas and for the targeted users. WP3 developed a large set of case studies involving different forms of geographical areas and transport contexts, demographic categories, population groups and mobility solutions. The case studies provide concrete experiences from various European sites and pilot initiatives involving both public and private transport providers and a variety of regulatory and business frameworks, as well as supporting technologies, organisational and operational conditions.

Complementary to this research, within WP4, a number of innovative solutions have been developed and implemented through real-life measures/interventions in the project's Pilot Labs (PL). The target PL areas, in Belgium, Germany, Hungary, Italy, Spain, and the UK, provided direct access to a variety of different transport environments, socio-economic contexts, cultural and geographical conditions. WP5 has undertaken a quantitative assessment of the impacts and a qualitative process evaluation of the innovative transport solutions implemented in the INCLUSION pilot sites. WP6 frames the lessons learnt and derives transferable solutions as regards technological, social and organisational innovation and their combination into effective, efficient and affordable mobility solutions with viable socio-business models (i.e. models not only economically, but also socially acceptable and sustainable).

The research and achievements obtained through the case studies' investigation and innovation experiments has been significantly enhanced and validated via external collaborations established in WP7 through a Stakeholders' Forum, set up at the onset of project activities and comprising transport operators, local authorities, users' associations, and advocacy groups, from different EU member states. WP7 aims also to raise awareness and promote and disseminate the project results for the take-up of accessible transport solutions across Europe and beyond.

---

[1] *In the context of INCLUSION, prioritised areas are defined as those transport environments (area types) with gaps in transport infrastructure and/or service provision that significantly impact upon transport accessibility, inclusivity and equity, and where the challenges in serving target user groups and their mobility needs and requirements are greatest (this includes rural and remote and deprived urban areas).*

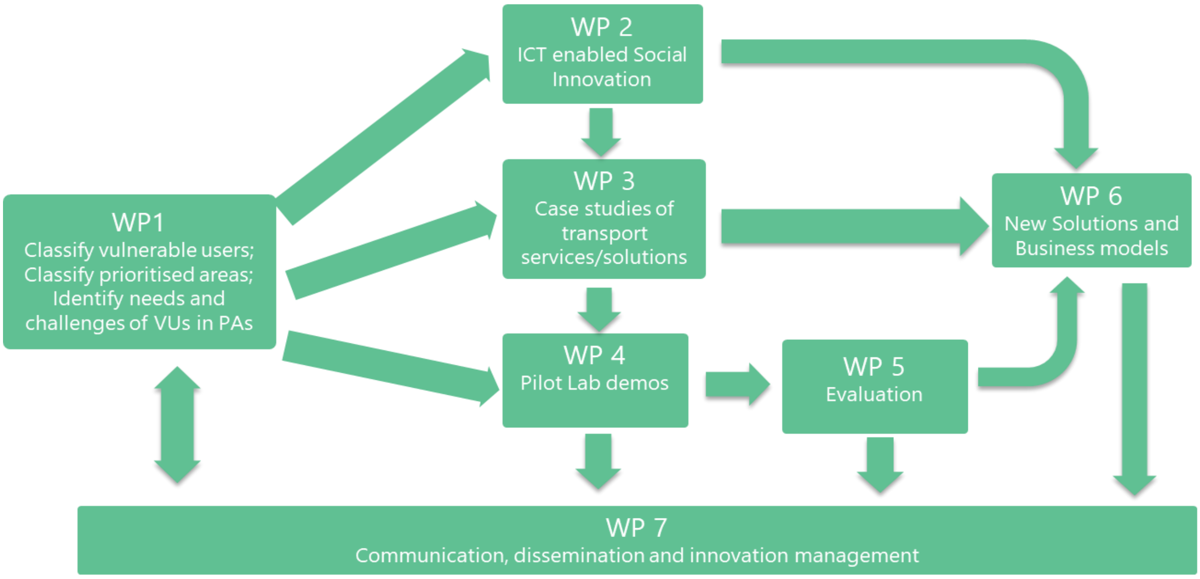

WP 2
ICT enabled Social Innovation
WP 3
Case studies of transport services/solutions
WP1
Classify vulnerable users; Classify prioritised areas; Identify needs and challenges of VUs in PAs
WP 6
New Solutions and Business models
WP 4
Pilot Lab demos
WP 5
Evaluation
WP 7
Communication, dissemination and innovation management

Figure 1 WP interrelations

The main aim of WP6 is to Identify and develop business concepts and solutions for the promotion of accessible and inclusive mobility in prioritised areas.

This work package builds on the knowledge gained in WP1 (Prioritised areas, user groups and needs assessment) and WP3 (Case Studies of mobility solutions) and enhances this with experiences gained in WP2 (ICT enabled Social Innovation ideas) and the experience and lessons learnt in WP4/5 (Demonstration and evaluation of inclusive mobility solutions at Pilot Lab sites).

WP6 captures best practice from the INCLUSION case studies and pilot labs and uses this to identify and develop business concepts for the promotion of accessible and inclusive mobility in prioritised areas. The identified concepts are then mapped to and described as a set of coherent scenarios for delivering the business concepts based on the situation specific context, taking account of the type of area where the scenario is applicable along with the mechanism for delivering the scenario including who is involved, how it is financed, for which target groups it is appropriate, and whether any key legislation needs to be adhered to. Using an adaptation of the common business model canvas, each scenario is then described as a business model based on example solutions implemented within WP4 of the project or based on good practice examples featured in the WP3 case study review.

The next and final deliverable in WP6 (*D6.2 Recommendations on the transferability of the proposed business models*, due at the end of the project in Sept 2020, M36) will further explore a selection of the most promising Business Models, informed through INCLUSION project experiences, to support vulnerable users in prioritised areas. This will lead to recommendations on transferability of the proposed business models to other prioritised areas across Europe in terms of technological, social and organisational innovation.

3 Methodology

The approach used in this Deliverable is summarised in the schema illustrated in Figure 2. This schema provides a roadmap to the contents of this report, with the boxes reflecting the different sections. The user needs frame the demand side, while the mobility gaps relate to the requirements on the supply side to better address the needs of vulnerable users. A number of business concepts are then established from the inclusivity goals while ensuring compatibility with the policy and planning priorities for the next 10 years as highlighted in the SUMP 2.0 guidance.

Finally, informed from analysis of the 51 case studies explored in WP3 and the demonstration measures implemented in WP4, a series of business models are developed which present the most plausible approaches to delivering the business concepts. These business models, based on particular scenarios, take into account the actors involved, area type, and funding mechanism. The scenarios also highlight legislative considerations and the vulnerable users who are beneficiaries.

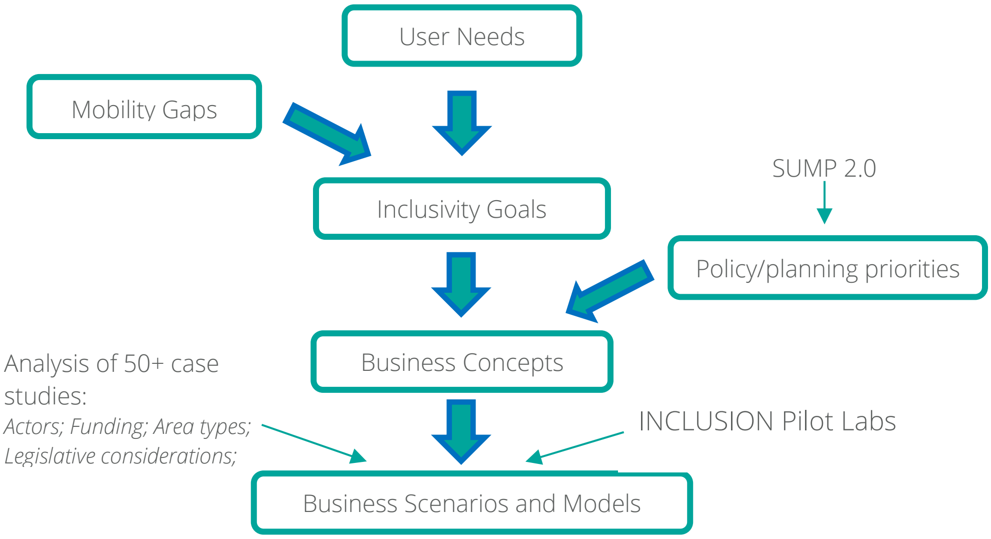

User Needs
Mobility Gaps
SUMP 2.0
Inclusivity Goals
Policy/planning priorities
Analysis of 50+ case studies:
Actors; Funding; Area types; Legislative considerations;
Business Concepts
INCLUSION Pilot Labs
Business Scenarios and Models

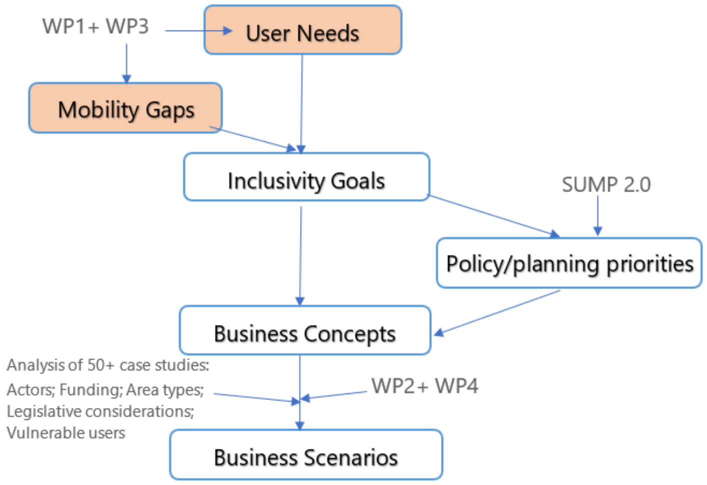
Figure 2 WP6 road map schema

4 Establishing the Business Concepts

From October 2019 on, the INCLUSION consortium started to identify and develop business concepts and solutions for the promotion of accessible and inclusive mobility in prioritised areas.

As a starting point, based on the extensive work carried out in previous INCLUSION activities, the INCLUSION Consortium developed a set of INCLUSIVITY GOALS. In particular, eight main goals were developed with the aim of merging the results of the analysis of major user needs with the identification of gaps in service provision.

4.1 Identifying what is needed: User needs and mobility gaps



INCLUSION has defined 12 user groups that are vulnerable to exclusion (see Chapter 4 of D3.4[2] *for more detailed analysis of user needs). These are illustrated in*

Figure 3. Some user groups are vulnerable because they have limitations on what they can do due to physical impairments, cognitive impairments or communication/language barriers - this results in being excluded from the use of mobility services unless adaptations are made or assistance being provided to better cater for their needs. Other user groups may be classed as vulnerable due to a lack of available (and safe) transport options resulting in their being excluded from accessing employment, key services or from participation in social and cultural activity. Those without access to a car, especially young people, in rural areas and women can often belong in this category. Finally, other groups may be classed as vulnerable due to a lack of affordable transport options resulting in their being excluded from accessing employment, key services or from participation in social and cultural activity. People with a low income, migrants and teenagers/students often find themselves excluded in this way.

---

[2] *For further information, see the INCLUSION Deliverable D3.4 – Typology and description of underlying principles and generalisable lessons, available at http://www.h2020-inclusion.eu/resources/publications/*

Each user group has varying needs in terms of accessibility, affordability, convenience, efficiency, empowerment, empathy, gender equity and safety. To sufficiently address these needs, it is important to be aware that many users are associated with more than one of the 12 user categories, and therefore 1) have multiple needs, and 2) are consequently more seriously affected that if only challenged by one category of need. For example, an elderly migrant woman tends to face greater challenges than someone who solely identifies as an elderly user or as a migrant. People with disabilities and impairments, including the elderly, often cannot drive and have a low income and so can be vulnerable to exclusion in all three dimensions of the Venn diagram.

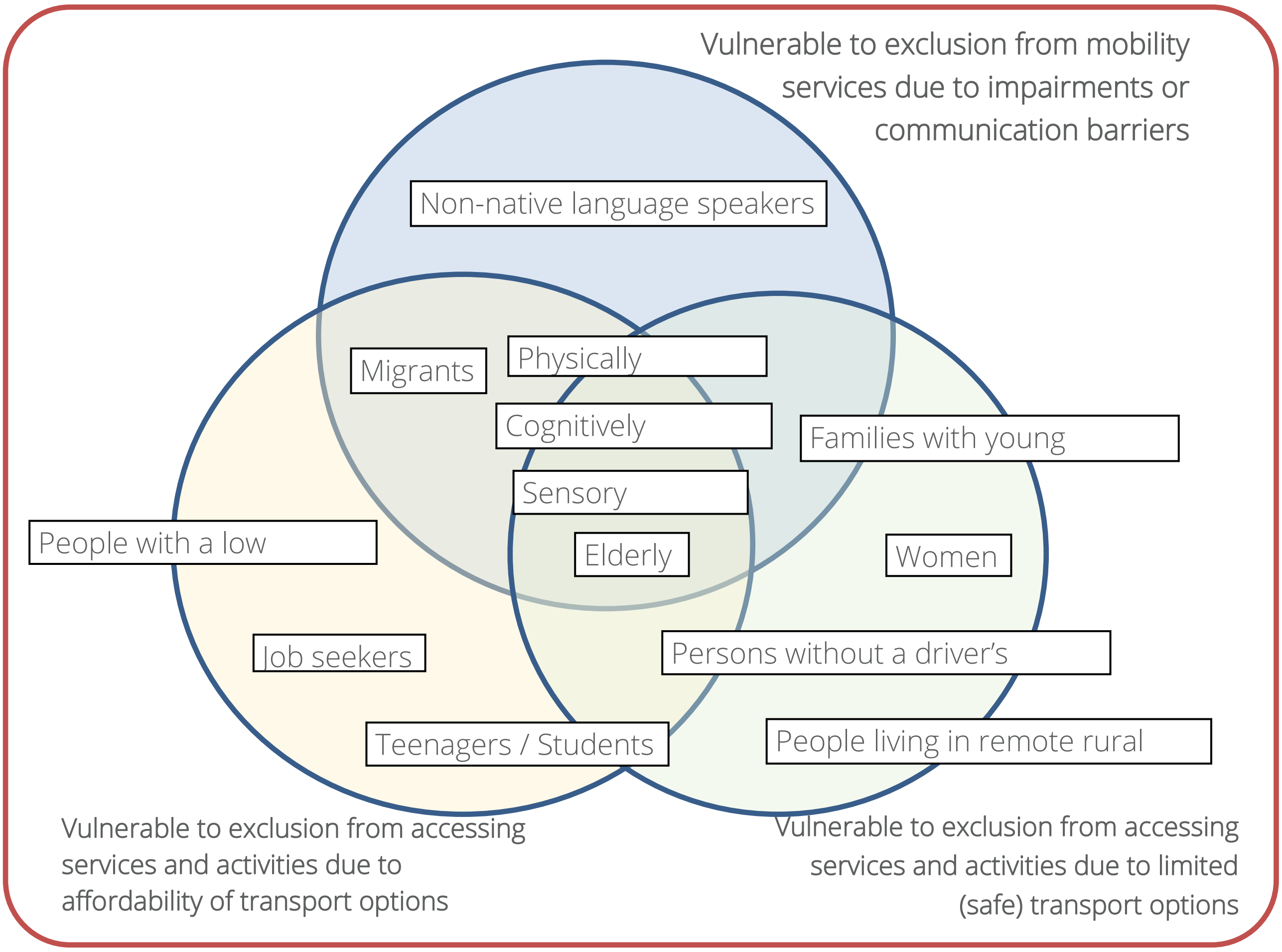

Vulnerable to exclusion from mobility services due to impairments or communication barriers
Non-native language speakers
Migrants
Physically
Cognitively
Sensory
Elderly
Families with young
Women
People with a low
Job seekers
Persons without a driver's
Teenagers / Students
People living in remote rural
Vulnerable to exclusion from accessing services and activities due to affordability of transport options
Vulnerable to exclusion from accessing services and activities due to limited (safe) transport options

Figure 3 Venn diagram illustration of vulnerable user categories

Through literature review, expert workshops, the stakeholder forum and surveys/interviews with user groups, operators / service providers and funding organisations, WP1 identified a number of common challenges and barriers to provision of inclusive and equitable mobility services amongst the different vulnerable user groups. These included:

- Poverty
- Budget constraints
- Lack of accessibility
- Inadequate service integration

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

- Lack of information
- Illegible or incomprehensible information
- Lack of correspondence between user needs and service provision
- Inadequate training of staff to provide assistance/information to users;
- Inadequate safety measures or unsafe infrastructure
- Lack of access to or understanding of technology

It was acknowledged that challenges to the provision of transport services and infrastructure, while affecting different users to different extents, are also often related to the geography and economic characteristics of an area and so have different prominence in different prioritised areas.
The main conclusions from WP1 were as follows:

- Better communication with communities of need is necessary, particularly during planning processes.
    - Taking a more inclusive, communicative approach to transport planning will allow for better, more efficient transport plans to be made that more robustly serve the needs of the most vulnerable users.

- Spatial and temporal coverage of services need to be considered for all users.
    - While often centred on 'peak hour' needs, shifting employment patterns, changing family demographics, and more dispersed activity-based lifestyles require that better transport coverage is needed in terms of both space and time to ensure that all users have equal access to opportunities that may not fit into traditional working hours.

- Better service integration is needed.
    - With more heavily dispersed populations, it is unlikely that a one-seat trip, provided by one operator, will adequately serve the needs of all users. Integration, however, should be a multidimensional consideration, encompassing integration of services (including non-transport services), payment, and information.

- More effective information sharing processes should be developed.
    - In order to fully serve the needs of all users, transport information should be accurate and reliable, accessible from a variety of platforms (including digital and paper) and in a variety of formats (including, for example, images, text, and multiple languages).

- New service provision should be explored.
    - This should include considerations beyond traditional bus and rail services, and incorporate walking, cycling, car-share, carpool, taxis, and other services.

- More financial and policy support is needed from local and national government.
    - Financial concerns were regularly raised, both regarding the cost of transport for users and for the cost of providing service to vulnerable populations and areas. Cost was identified as a significant barrier for transport use, indicating that more considerations should be made for ways to offset its impact.

Expanding on the WP1 work, WP3 of the project conducted a review of 50+ case study solutions to explore in more depth the extent to which the user needs and gaps in service provision, highlighted in WP1, have been tackled in practice[3]. This provided insight into the specific needs of users addressed by differing solutions as well as the funding, organisational and legislative frameworks, and operational and other criteria which are important for delivery of successful solutions. The WP3 case study review highlighted a number of key user principles (related to user needs) for the transport system relevant to vulnerable users:

ACCESSIBLE

The transport network, stations, vehicles and information are barrier-free (physically, sensory and linguistically). This also includes ticket machines, apps for smartphone accessibility features, simple user-centric access to digital devices, acoustic and visual announcements at stations and aboard vehicles.

AFFORDABLE

Transport services are affordable for all users, in particular vulnerable users, relative to their income and proportional to their other overall cost of living. An inclusive society will have to cover related costs and subsidies and avoid imposing a major cost factor on any particular user group(s).

CONVENIENT

The time and/or effort required for vulnerable users to reach a transport service (e.g. first and last mile) are minimised so that these users can benefit from the service in their everyday lives. Distance to the nearest service, reliability and adequate information provision about the service (e.g. timetables, route planning) contribute to its convenience.

EFFICIENT

Once vulnerable users are aboard a vehicle, the time and/or effort required to use the service (e.g. longer journey times, changing vehicles multiple times) are minimised so that these users can benefit from the service in their everyday lives. The main factors contributing to efficiency are vehicle routes, network coverage and intermodal connectivity.

While these user principles are related to all users of transport systems, several of them have particular importance for vulnerable users.

- Accessibility in terms of infrastructure, vehicles, and service information requires extra attention for many vulnerable user groups such as those with physical impairments and those who have difficulties understanding text information; e.g. those with cognitive impairments and immigrants with local language difficulties.

---

[3] *For further information, see the INCLUSION Deliverable D3.4 – Typology and description of underlying principles and generalisable lessons, available at* http://www.h2020-inclusion.eu/resources/publications/

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

- Affordability is often a barrier to vulnerable low-income users such as young persons, unemployed and older persons for whom cost of travel can be a significant barrier to use.
- Convenience, especially for the first and last mile of journeys is a critical factor for many vulnerable users who find it difficult to walk short distances or who cannot spend periods standing outside at bus stops.

WP3 also identified several other needs of vulnerable users which introduce a more human dimension to the desired solutions. These include:

EMPOWERING

Mobility solutions that build vulnerable users' capacities to get around confidently in their everyday lives. This idea can manifest in a training course or a scheme of "travel buddies" for certain social groups so that they are enabled to use certain transport options without requiring help by other people. Also technology can play a role here if it creates new degrees of freedom.

EMPATHETHIC

Empathy-building initiatives foster awareness and build capacities (e.g. through training) among the transport provider and general public for vulnerable users' needs and increase their readiness to help. Sometimes, mobility options would be more accessible if there were some kind of "helping hand" (literally or metaphorically) to support vulnerable users.

GENDER EQUITABLE

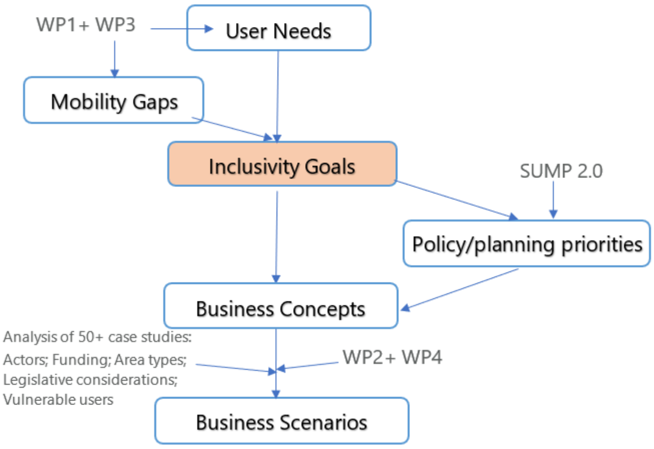
Gender equitable mobility services enable all users, regardless of gender identity or orientation, to have access to transport services that meet their daily needs. This does not require providing equal services for all, but rather providing services that are equivalent but different, recognising that not all groups have the same mobility needs. Measures that improve and facilitate intermodality, accessibility and safety are primary considerations for gender equity.

SAFE

Mobility services that increase the perceived and actual safety of all vulnerable users by preventing accidents, theft, violence and harassment. Related interventions include hard measures (e.g. lighting, spatial layout, station and vehicle design, signage, emergency buttons, etc.) as well as soft measures such as human surveillance, communication, staff training and public awareness campaigns.

These generally relate to the users' confidence in using mobility services and solutions which include these dimensions were found to be especially relevant and important for certain vulnerable users. Other than safety, these less traditional user needs are often overlooked by existing funding mechanisms and as a result examples of social innovation and low-cost community solutions have emerged, which contributed significantly to the success of many of the 51 case studies reviewed in work package 3.

4.2 Inclusivity Goals


WP1+ WP3
User Needs
Mobility Gaps
Inclusivity Goals
SUMP 2.0
Policy/planning priorities
Business Concepts
Analysis of 50+ case studies:
Actors; Funding; Area types;
Legislative considerations;
Vulnerable users
WP2+ WP4
Business Scenarios

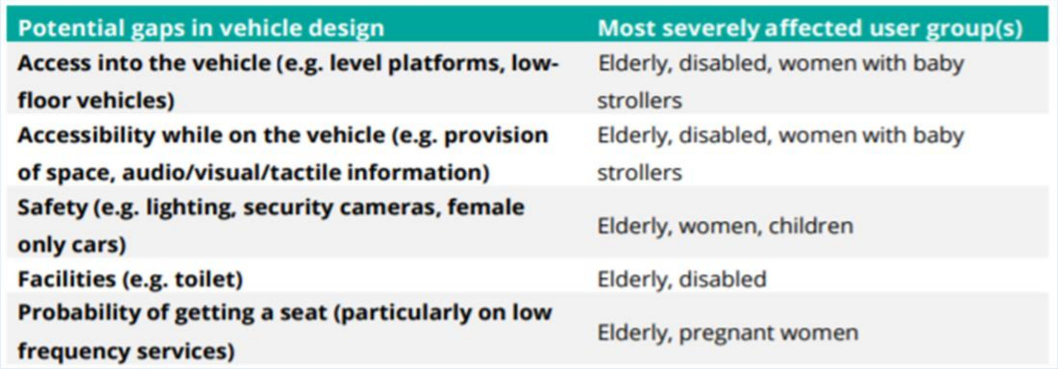
While the user principles/needs frame the requirements on the demand side, the mobility gaps highlight what is needed on the supply side to better address these user needs. Again, based on the findings from WP1 and in particular the case study review work of WP3 (see Deliverable 3.4 - *Typology and description of underlying principles and generalisable lessons),* a set of 8 key Inclusivity Goals, presented below, have been identified that relate to vulnerable users' needs and address identified mobility gaps. The mapping of user principles to inclusivity goals is also included in the boxes below.

Inclusivity Goal 1: Ensure vehicle design accommodates vulnerable user's needs:

Conventional public transport is designed for the mainstream market, resulting in many inadequacies for vulnerable user groups. One of these relates to vehicle design. Vehicles need to be designed, built and operated so that they are easy to use for all. This goal removes physical accessibility barriers but also improves safety and comfort when travelling on the vehicle.

User Principles Covered: ♿ **ACCESSIBLE** ⚠ **SAFE**

Mobility Gaps Addressed: 🚌 **VEHICLE DESIGN**



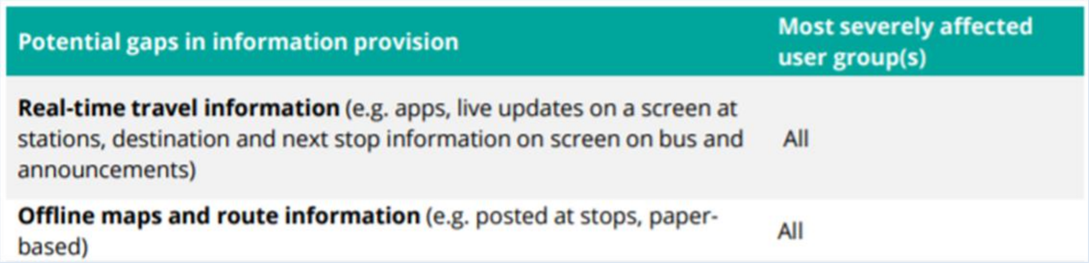
Potential gaps in vehicle design	Most severely affected user group(s)
Access into the vehicle (e.g. level platforms, low-floor vehicles)	Elderly, disabled, women with baby strollers
Accessibility while on the vehicle (e.g. provision of space, audio/visual/tactile information)	Elderly, disabled, women with baby strollers
Safety (e.g. lighting, security cameras, female only cars)	Elderly, women, children
Facilities (e.g. toilet)	Elderly, disabled
Probability of getting a seat (particularly on low frequency services)	Elderly, pregnant women

Inclusivity Goal 2: Provide information that is tailored to vulnerable user needs

Information is often provided in ways that are not understandable to some vulnerable users or in formats that are not suitable or useable. Ensuring that transport operators provide information in formats that all passengers can easily access and understand, both before and during a journey, is key. Technology solutions need to be tailored to the capabilities of vulnerable users.

User Principles Covered: ♿ **ACCESSIBLE** **CONVENIENT** **EMPOWERING**

Mobility Gaps Addressed: ℹ **INFORMATION PROVISION**



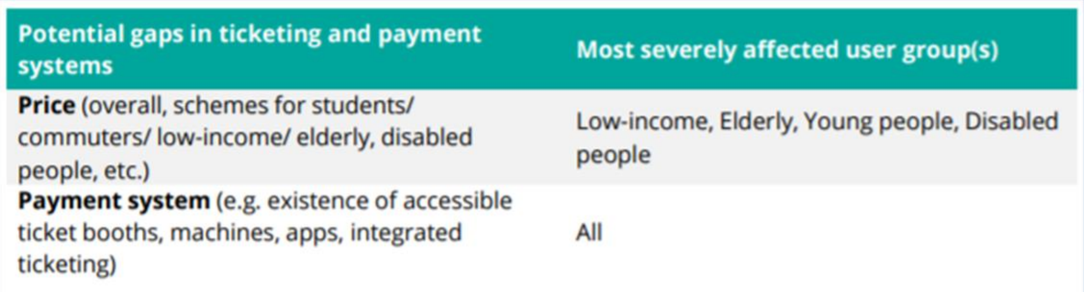
Potential gaps in information provision	Most severely affected user group(s)
Real-time travel information (e.g. apps, live updates on a screen at stations, destination and next stop information on screen on bus and announcements)	All
Offline maps and route information (e.g. posted at stops, paper-based)	All

Inclusivity Goal 3: Reduce financial barriers for vulnerable users to travel

Cost of travel can be a significant barrier to use of services. This is especially the case in rural areas where distances are longer and costs higher, and for use of services offered by purely market-based companies who do not offer discounted fares for vulnerable segments of the population. Reducing financial barriers is not simply about providing bus fare discounts for certain user categories, it is also about re-thinking payment systems and subsidy models in use in order that affordable transport can be offered to vulnerable users for a wider range of transport services.

User Principles Covered: **AFFORDABLE**

Mobility Gaps Addressed: **TICKETING and PAYMENT**



Potential gaps in ticketing and payment systems	Most severely affected user group(s)
Price (overall, schemes for students/ commuters/ low-income/ elderly, disabled people, etc.)	Low-income, Elderly, Young people, Disabled people
Payment system (e.g. existence of accessible ticket booths, machines, apps, integrated ticketing)	All

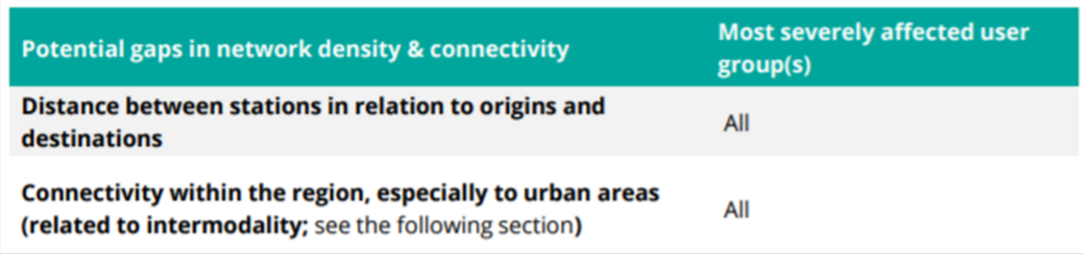
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

Inclusivity Goal 4: Provide services that increase coverage / reduce travel time

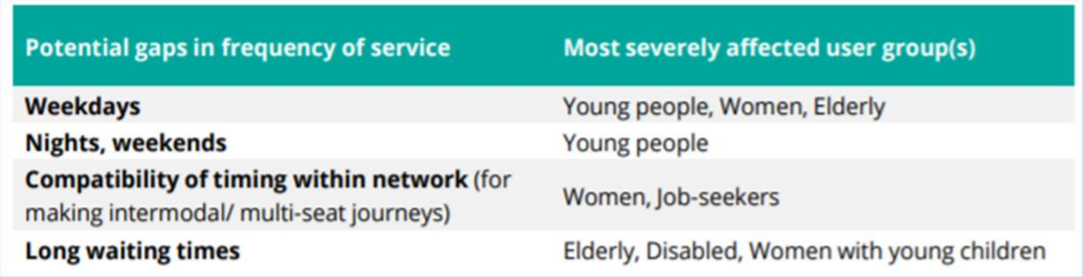
In order that vulnerable users can utilise a transport service, it has to firstly exist in the locations and at the times needed. Coverage in rural and peri-urban areas is a significant barrier to using public transport, but this can also be a problem during weekends and evenings/early morning in some urban areas. After this, the services need to go to the destinations desired in a timely fashion; infrequent services and long waiting times can make use of public transport unattractive to many vulnerable user groups, especially where physically standing at bus stops poses a difficulty or where perceived lack of safety at bus stops is an issue for some vulnerable users.

User Principles Covered: **CONVENIENT** **EFFICIENT**

Mobility Gaps Addressed: **NETWORK CONNECTIVITY** **RELIABILITY**



Potential gaps in network density & connectivity	Most severely affected user group(s)
Distance between stations in relation to origins and destinations	All
Connectivity within the region, especially to urban areas (related to intermodality; see the following section**)**	All



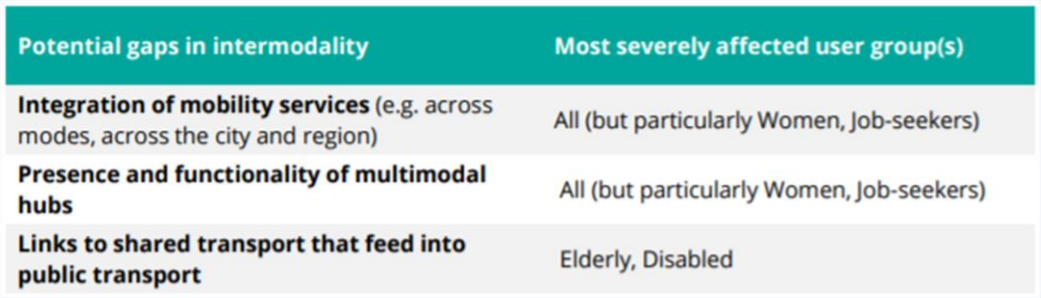
Potential gaps in frequency of service	Most severely affected user group(s)
Weekdays	Young people, Women, Elderly
Nights, weekends	Young people
Compatibility of timing within network (for making intermodal/ multi-seat journeys)	Women, Job-seekers
Long waiting times	Elderly, Disabled, Women with young children

Inclusivity Goal 5: Provide services that increase inter-modality or choice

This business goal is about providing a greater variety of services and ensuring that these are accessible to all and integrated to the existing service network. This links to the previous goal since increasing inter-modality also increases connectivity and hence coverage. It also offers more choice in the routes and services available. Services should aim to be inclusive and not restrict use to one group or another. This can expand choice and equity of provision for vulnerable users.

User Principles Covered: **CONVENIENT** **EFFICIENT** **GENDER EQUITABLE**

Mobility Gaps Addressed: **INTERMODAL**



Potential gaps in intermodality	Most severely affected user group(s)
Integration of mobility services (e.g. across modes, across the city and region)	All (but particularly Women, Job-seekers)
Presence and functionality of multimodal hubs	All (but particularly Women, Job-seekers)
Links to shared transport that feed into public transport	Elderly, Disabled

Inclusivity Goal 6: Provide support to increase confidence to travel

To ensure that all transport services are useable by a larger number of vulnerable users, especially those with mental, cognitive or sensory impairments. Technologies can potentially offer specialist information and assistance services to vulnerable users with complex needs, but often requires human assistance either virtually through the technology, or in the form of personal assistants accompanying travellers or by providing travel training.

User Principles Covered: **EMPOWERING** **EMPATHETIC** **SAFE**

Inclusivity Goal 7: Make staff / planners / providers more aware and responsive to the needs and capabilities of vulnerable users

Ensuring that transport staff (frontline and managerial) understand the needs of disabled people with physical, mental, cognitive or sensory impairments, and can provide better assistance. This also relates to staff making individuals who may feel uncertain or unsafe to feel welcome and accepted on public transport.

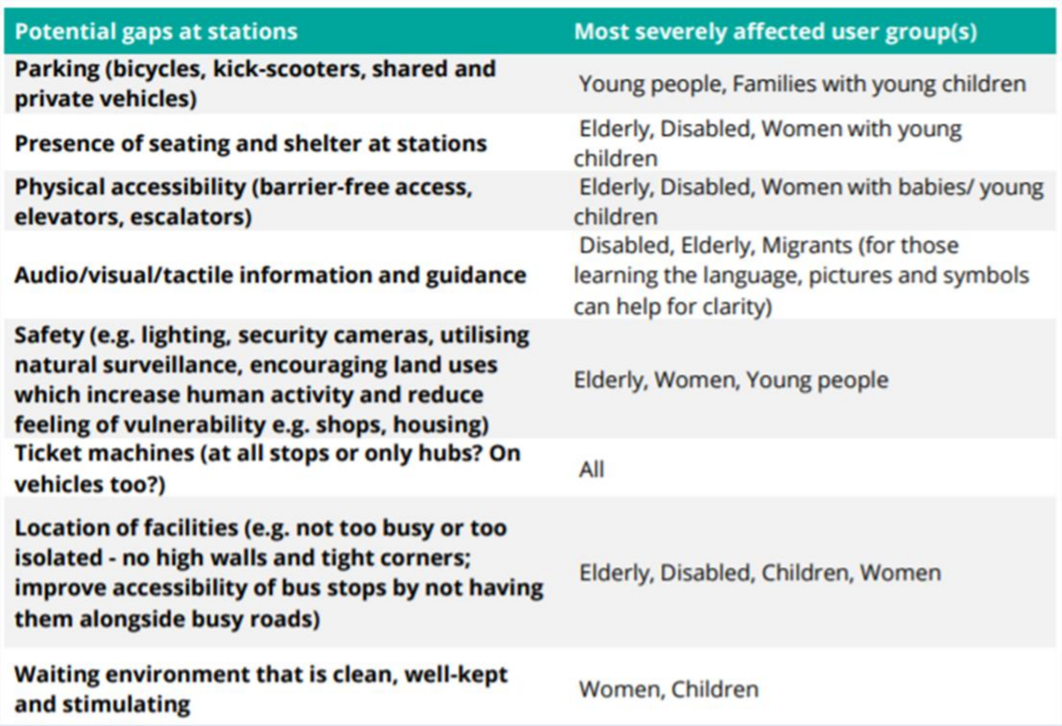
User Principles Covered: **EMPATHETIC** **SAFE**

Inclusivity Goal 8: Ensure station design accommodates vulnerable user's needs:

The design and location of public transport stations are of significant main importance to ensure that they are usable for people who are vulnerable to exclusion from the transport system. Lighting, security cameras, and the presence of public transport staff can contribute to a sense of safety. Barrier-free access (e.g. ramps, escalators, elevators) and audio/visual/tactile information and ticket machines contribute to stations' accessibility. Stations should also be conveniently placed within walking distance of users prone to mobility exclusion, e.g. schools, nursing homes, hospitals, major centres of employment. The presence of bike parking and "pedestrian parking" (i.e. seating) further contributes to users' ability to use a station.

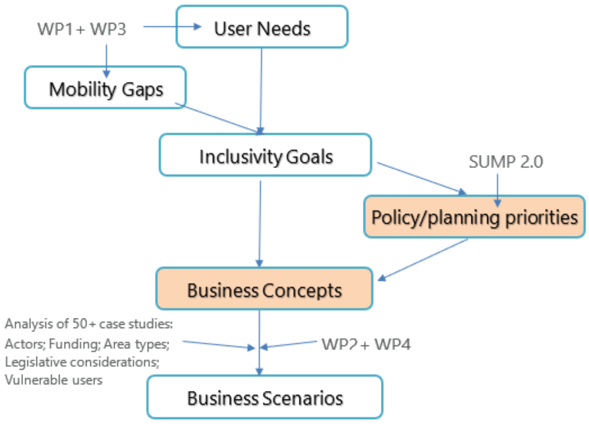
User Principles Covered: **ACCESSIBLE** **SAFE** **CONVENIENT**

Mobility Gaps Addressed: **STATIONS**



Potential gaps at stations	Most severely affected user group(s)
Parking (bicycles, kick-scooters, shared and private vehicles)	Young people, Families with young children
Presence of seating and shelter at stations	Elderly, Disabled, Women with young children
Physical accessibility (barrier-free access, elevators, escalators)	Elderly, Disabled, Women with babies/ young children
Audio/visual/tactile information and guidance	Disabled, Elderly, Migrants (for those learning the language, pictures and symbols can help for clarity)
Safety (e.g. lighting, security cameras, utilising natural surveillance, encouraging land uses which increase human activity and reduce feeling of vulnerability e.g. shops, housing)	Elderly, Women, Young people
Ticket machines (at all stops or only hubs? On vehicles too?)	All
Location of facilities (e.g. not too busy or too isolated - no high walls and tight corners; improve accessibility of bus stops by not having them alongside busy roads)	Elderly, Disabled, Children, Women
Waiting environment that is clean, well-kept and stimulating	Women, Children

4.3 How do we deliver what is needed?



The previous section identified the requirements on the demand side based on vulnerable user priorities and what is needed on the supply side based on known mobility gaps to establish a set of seven inclusivity goals. To be able to deliver services that address the inclusivity goals requires compatibility with the policy priorities of the cities and regions in which vulnerable users live. For mobility related policy, these priorities will be shaped over the next decade by the second edition of the Sustainable Urban Mobility Plan (SUMP 2.0) Guidelines[4], released in October 2019. This document provides the main planning guidance which will dictate where investment of public funds and staff resources will be prioritised over the next decade. All cities and municipal authorities are required to adhere to this guidance.

The SUMP guidance has the core goal to improve accessibility and quality of life by achieving a shift towards sustainable mobility. It places particular emphasis on the involvement of citizens and stakeholders, the coordination of policies between sectors and broad cooperation across different layers of government and with private actors. The concept also emphasises the need to cover all aspects of mobility modes and services in an integrated manner. The primary SUMP objectives which have direct relevance to planning and delivery of inclusive mobility include:

- Enhancing accessibility and quality of life, including social equity, health and environmental quality, and economic viability
- Integrated development of all transport modes and shift towards sustainable mobility
- Combination of infrastructure, market, regulation, information and promotion
- Interdisciplinary planning
- Planning with the involvement of stakeholders and citizens using a transparent and participatory approach
- Optimise efficiency and cost effectiveness;

---

[4] http://www.rupprecht-consult.eu/uploads/tx_rupprecht/SUMP_Guidelines_2019_mediumres.pdf

More specifically it promotes the need for:

- More **integration in planning**: Cooperation to ensure the consistency and complementarity with policies and plans in sectors related to transport (e.g. land use and spatial planning, social services, health, energy, education, enforcement and policing). Social services, health and education sectors have particular relevance in the planning of inclusive mobility solutions;
- More **integration and choice in delivery**: Developing all transport modes in an integrated manner to improve quality, choice, safety, accessibility, and cost effectiveness of the overall mobility system - includes active mobility (walking and cycling); inter-modality and door-to-door mobility;
- Better **understanding and support**: Actively involving citizens and other stakeholders making public acceptance and support more likely. There is also the need for increased professional support through training, and professionals who are able to convey the needs of vulnerable users to all actors.

Filtering the above objectives with vulnerable users in mind, we derive the following key priorities for public sector promotion, support and investment (illustrated in Figure 4Figure 44):

- Enhancing **accessibility and quality of life** through delivery of both transport and support services that all people can access and utilise, ensuring ability to **travel independently**
- Enhancing **social equity** through **more choice** of services that are usable by vulnerable users and that provide connection to destinations vulnerable users desire access to.
- Increasing **economic viability** and expanding the range of sustainable travel options by supporting **more sharing** of resource both amongst end users and through interdisciplinary sharing between public authorities in different sectors.
- **Optimise efficiency and cost effectiveness** by **improving integration** in planning, financing and delivery of services leading to more **socially equitable** mobility options for vulnerable users.

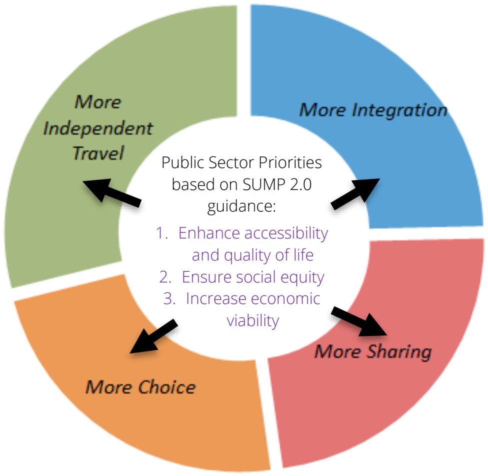

More Independent Travel
More Integration
Public Sector Priorities based on SUMP 2.0 guidance:
1. Enhance accessibility and quality of life
2. Ensure social equity
3. Increase economic viability
More Sharing
More Choice

Figure 4 Key priorities for public sector promotion, support and investment for inclusive mobility

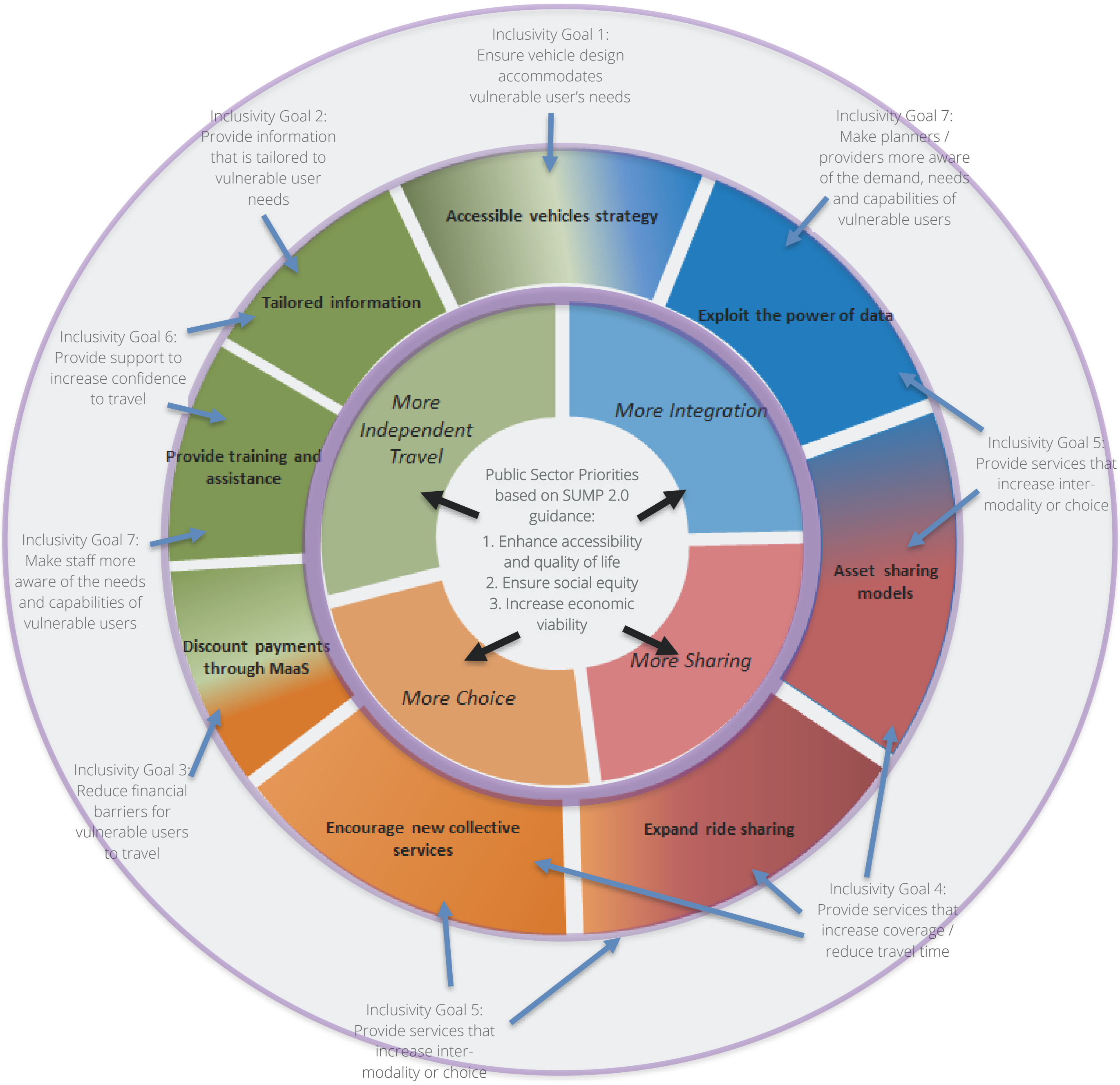
Figure 5 presents the public-sector policy and planning priorities for the next 10 years as stipulated in SUMP2.0 guidance (the inner ring) along with the seven[5] inclusivity goals based on vulnerable user needs and existing gaps in mobility service (the outer ring). The middle ring identifies 8 business concepts that provide the link between policy priorities and vulnerable user needs. The 'more integration' and 'more sharing' goals are most relevant to ensuring social equity and increasing economic viability from the supply side and are depicted on the right-hand side of the diagram (Figure 4). The 'more choice' and 'more independent travel' are most relevant to enhancing accessibility and quality of life on the demand side, depicted on the left-hand side of the diagram.

---

[5] Note that the inclusivity goal related to stations, although of significant importance for vulnerable users accessing services at these points, are typically the sole responsibility of the public authority and not private or community sector service providers and are financed through separate mechanisms. Requirements for station/stop infrastructure should be explored at the co-participation planning stage with the needs of users and capabilities/requirements of providers exchanged with the public-sector planners and funders. As a result, they are not included in business scenario development and assessment work.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

Figure 5 Illustration of the three rings representing public sector priorities, business concepts, and inclusivity goals


Inclusivity Goal 1: Ensure vehicle design accommodates vulnerable user's needs
Inclusivity Goal 2: Provide information that is tailored to vulnerable user needs
Inclusivity Goal 7: Make planners / providers more aware of the demand, needs and capabilities of vulnerable users
Inclusivity Goal 6: Provide support to increase confidence to travel
Inclusivity Goal 5: Provide services that increase inter-modality or choice
Inclusivity Goal 7: Make staff more aware of the needs and capabilities of vulnerable users
Inclusivity Goal 3: Reduce financial barriers for vulnerable users to travel
Inclusivity Goal 4: Provide services that increase coverage / reduce travel time
Inclusivity Goal 5: Provide services that increase inter-modality or choice
Accessible vehicles strategy
Tailored information
Exploit the power of data
Provide training and assistance
Asset sharing models
Discount payments through MaaS
Encourage new collective services
Expand ride sharing
More Independent Travel
More Integration
More Sharing
More Choice
Public Sector Priorities based on SUMP 2.0 guidance:
1. Enhance accessibility and quality of life
2. Ensure social equity
3. Increase economic viability

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

Table 1 List of the 8 Business Concepts and the Inclusivity Goals addressed by each

Business concept	Business case	Inclusivity Goal
BC1: Accessible Vehicles Strategy Conventional PT vehicles to be inclusive for all	Increase patronage Reduce need for specialist transport provision/budgets	Goal 1: Ensure vehicle design accommodates vulnerable user's needs
BC2: Exploit the Power of Crowdsourced Data Data capture using technology can help better understand user needs leading to better, more integrated, planning decisions	Interdisciplinary cross sector funding Cost effective funding decisions	Goal 7: Make planners / providers more aware of the demands, needs and capabilities of vulnerable users Goal 5: Provide services that increase inter-modality or choice
BC3: Asset sharing models Increase transport options to users in an economically viable manner	Foster cooperation between sectors – reduce sector specific dedicated services Cost effective delivery	Goal 5: Provide services that increase inter-modality or choice Goal 4: Provide services that increase coverage / reduce travel time
BC4: Expand Ride-Sharing Utilise ride-sharing options to plug gaps in core service at low cost	Increase coverage at low cost Increase integration	Goal 4: Provide services that increase coverage / reduce travel time Goal 5: Provide services that increase inter-modality or choice
BC5: Encourage new collective services Lower cost services that better meet vulnerable user demands	Potential to open-up new market segments Niche solutions More cost-efficient supply	Goal 4: Provide services that increase coverage / reduce travel time Goal 5: Provide services that increase inter-modality or choice
BC6: Discount payments through MaaS Providing financial support to users should not only remove affordability barriers for users but also stimulate new or enhanced service provision	Motivate commercial mobility providers to cater for vulnerable users Mechanism for other sector funding	Goal 3: Reduce financial barriers for vulnerable users to travel
BC7: Provide Training and Assistance Human intervention to support independent travel by vulnerable users	Increase patronage Reduce need for specialist transport provision/budgets	Goal 6: Provide support to increase confidence to travel Goal 7: Make staff more aware of the needs and capabilities of vulnerable users
BC8: Tailored Information Technology and other information solutions to support independent travel by vulnerable users	Increase patronage Reduce need for specialist transport provision/budgets Facilitates inter-modality	Goal 2: Provide information that is tailored to vulnerable user needs Goal 6: Provide support to increase confidence to travel

5 Scenarios and Business Model descriptions

For each business concept identified in Section 4, a set of scenarios was developed describing variations in the conditions and manner in which solutions can be delivered to particular vulnerable user groups. Each scenario was then used as the basis for developing a set of business models (BMs). To do this, generic BMs were designed following the Business Model Canvas methodology and adapted for the BMs addressing Inclusive Mobility Solutions. **Errore. L'origine riferimento non è stata trovata.** illustrates the steps in this process which are then reported in the remainder of this section.

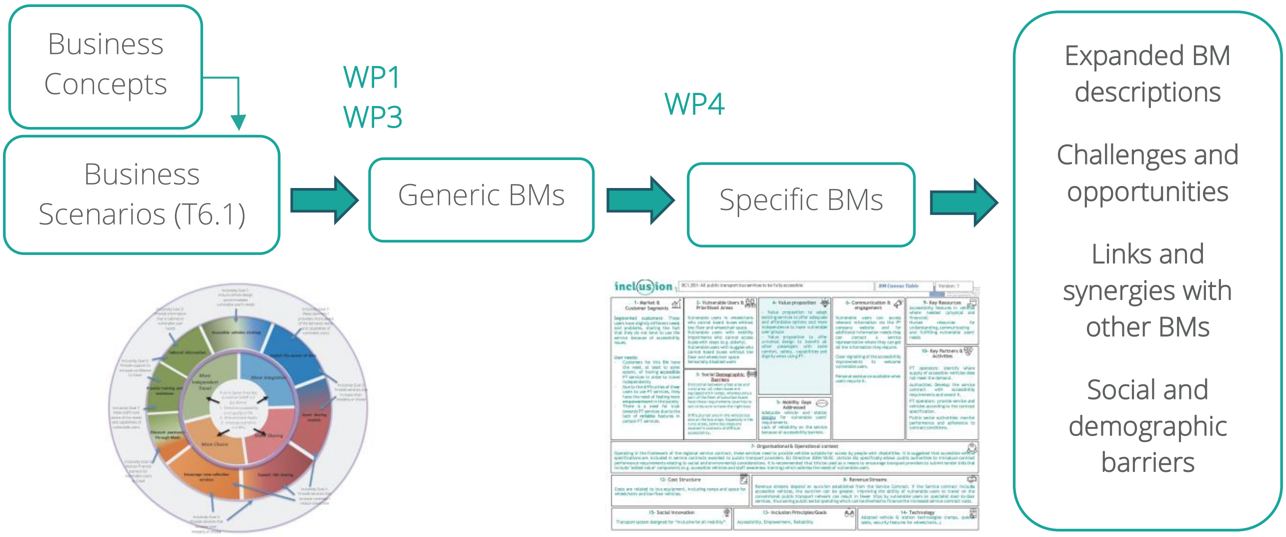

Business Concepts
Business Scenarios (T6.1)
WP1
WP3
Generic BMs
WP4
Specific BMs
Expanded BM descriptions
Challenges and opportunities
Links and synergies with other BMs
Social and demographic barriers

Figure 6 Illustrating the steps developing business concepts to business scenarios to business models

Following description of the business scenarios, based on literature review, work package 3 case study good practice and INCLUSION work package 4 demonstration experience, a set of generic business models related to the scenario descriptions were identified. An online workshop was then organised with the INCLUSION partners to develop specific BMs based on their expertise (input from PLs, WP2 and WP3). Once the specific BMs were completed, a deep analysis was carried out to expand the BM descriptions, explain the challenges and opportunities of the actors involved, emphasise the synergies with the other INCLUSION BMs and, finally, carry out an analysis of the social and demographic barriers associated with each BM.

5.1 Scenarios development

The most appropriate approach for delivering the business concepts identified in Section 4 will be situation specific depending on the area and provider types, the capacity or capability of those providers, the funding options and associated funding conditions related to different types of provider, and other organisational and legislative frameworks that apply according to the types of target user. These different approaches and their characteristics are described through a number of potential scenarios associated with each business concept. A summary of each business concept and the list of associated scenarios is provided in Table 2: Summary of business concepts and list of business scenarios associated with eachTable 2 and illustrated in Figure 7.

Following this is an introduction to the scenario (more detailed scenario descriptions are provided in Appendix A[6]) followed by an example of the scenario illustrated through a Business Model Canvas based on a successful solution delivered in WP4 of the INCLUSION project or on good practice case studies featured in WP3 of the project. This is followed by an expanded explanation for certain key aspects featured in the BM canvas.

Challenges and opportunities that the Business Model presents are identified. This can be with regard to delivery or transferability and can relate to organisational, operational, technical, financial or societal issues. Within this, possible variations in BM features that might present challenges or lead to opportunities for the given scenario are highlighted.

Next, an indication is given of other scenarios with which there is synergy (i.e. where other scenario solutions enhance or reinforce the effectiveness of the featured scenario) or a dependency (i.e. where other scenario solutions are required to be in place in order for the featured scenario to become possible).

Finally, the barriers to the introduction or use of the proposed business model solution, resulting from social and demographic factors, are identified (the list of Social and Demographic factors considered in this assessment are included in Appendix B). These have implications for transferability and are analysed further in the next Deliverable D6.2 *Recommendations on the transferability of the proposed business models*, due at the end of the project in Sept 2020 (M36).

Table 2: Summary of business concepts and list of business scenarios associated with each

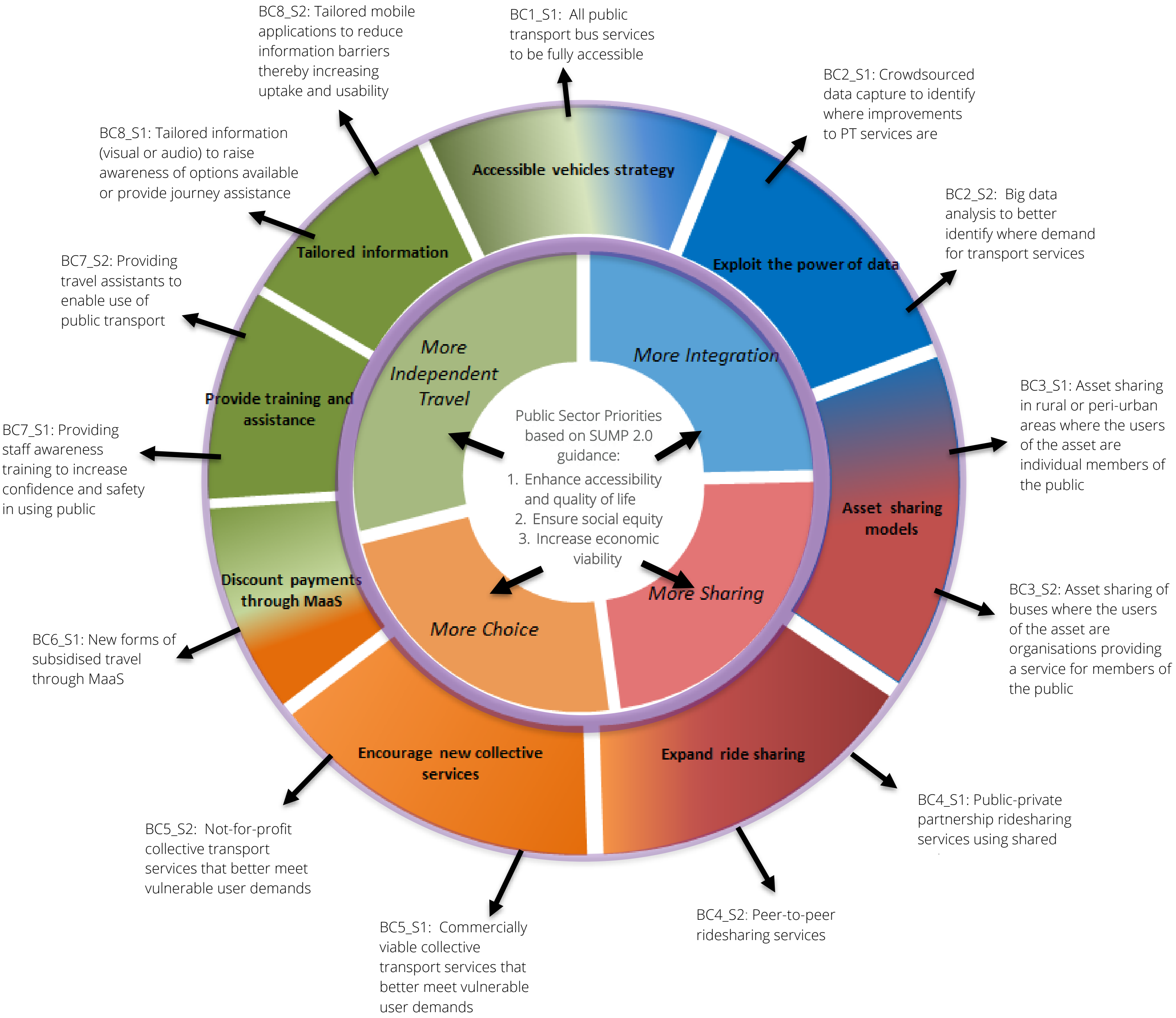
Business concept	Business Scenario	Summary
BC1: Accessible Vehicles Strategy Conventional PT vehicles to be inclusive for all	BC1_S1: All public transport bus services to be fully accessible	Removing accessibility barriers that prevent vulnerable users from utilising conventional Public Transport services by ensuring these operate with fully accessible vehicles. This will ensure that wheelchair users and those requiring low floor access to vehicles can access the conventional public transport network rather than rely on limited and expensive to provide specialist client transport services for health or social service clients. Audio and tactile features should also be introduced to vehicles for the visually impaired. Other vulnerable users to benefit are families with buggies. It is anticipated that this will increase patronage on conventional PT services and reduce need for specialist transport provision/budgets.

---

[6] This contains description of each of the scenarios indicating the type of area where the scenario is applicable along with the mechanism for delivering the scenario, including who is involved, how it can be financed, which target groups it is appropriate for and whether any key legislation needs to be adhered to.

BC2: Exploit the Power of Crowdsourced Data Data capture using technology to help better understand user needs leading to better, more integrated planning decisions	BC2_S1: Crowdsourced data capture to identify where improvements to PT services are needed BC2_S2: Big data analysis to better identify where demand for transport services exists	The emergence and widespread uptake and use of mobile technologies and social media platforms establishes an environment where individuals are exchanging information on all sorts of subjects. This business concept looks to develop tools whereby information on vulnerable users' mobility demands and needs can be exchanged, captured and analysed. This information is then utilised by transport planners and providers to deliver more efficient and effective services and more integrated planning decisions. Two different scenarios emerge for this concept: 1. Using mobile apps to collect crowdsourced data from vulnerable users to identify where improvements to PT services are needed. 2. Analysis of social media data to better identify where vulnerable user demand for transport services exists
BC3: Asset sharing models Increase transport options to users in an economically viable manner	BC3_S1: Asset sharing in rural or peri-urban areas where the users of the asset are individual members of the public BC3_S2: Asset sharing of buses where the users of the asset are organisations providing a service for members of the public	Asset sharing is when vehicles (scooters/bikes/e-bikes/mopeds/cars) are collectively owned (by the municipality, local company or community group) and they are made available for shared use by either individuals or local groups. Asset sharing models can provide more travel choices to users without the need for private ownership and can foster cooperation between sectors and hence reduce sector specific dedicated services resulting in more cost-effective delivery. The three main scenarios related to asset sharing can be defined according to the users of the asset, type of asset and the type of area.
BC4: Expand Ride-Sharing Utilise ride-sharing options to plug gaps in core service at low cost	BC4_S1: Public-private partnership ridesharing services using shared taxis BC4_S2: Peer-to-peer ridesharing services	Ride sharing options allow aggregation of the mobility demand for sharing a ride in the same vehicle. This can be done through: 1. Public-private partnership ridesharing services using shared taxis with professional drivers; 2. Peer-to-peer ridesharing services such as carpooling (where private individuals share the journey they are already making in their own car with other people going in the same direction at the same time) or volunteer lift-giving schemes (where drivers, usually with their own vehicle, offer lifts to certain users for free or for a small reimbursement). These types of solutions can increase coverage for non-essential trips at a low cost and also increase integration to the core transport network.
BC5: Encourage new collective services Lower cost services that better meet vulnerable user demands	BC5_S1: Commercially viable collective transport services that better meet vulnerable user demands BC5_S2: Not-for-profit collective transport services that better	New collective transport services are services scheduled to pick up and drop off people in accordance with the actual needs of the passengers based on demand. They need to be booked in advance of travel either through telephone booking or using mobile app technology. Software algorithms aggregate bookings to generate a schedule of pick-ups and drop-offs either door-to-door or at designated locations. The services can better accommodate needs of some vulnerable users by offering door-to-door pick-up and drop-off or by providing niche services where timings and routes are tailored to the demands of certain vulnerable user groups. As a result, they have potential to open up

	meet vulnerable user demands in rural areas	new market segments. They can be considered as flexible services that span the wide space between taxis and conventional public transport and are often a more cost-efficient form of supply in environments with niche/specific or low levels of demand.
BC6: Discount payments through MaaS Providing financial support to users	BC6_S1: New forms of subsidised travel through MaaS systems	Alternative ways of funding discounts for vulnerable users are needed which allow the discounted travel to be extended to a wider range of services, thus providing users with choices on the services they can afford to use. This requires inclusion of new collective flexible services provided by both private sector and community organisations, asset sharing hire services and possibly also volunteer and peer-to-peer services to be included in discounted travel schemes. An approach for achieving this is through use of a MaaS type system that offers a subscription payment model for use of all the transport options in an area. This has the potential to not only provide more affordable choices to vulnerable users supporting more independent travel, but also motivate commercial mobility providers to cater for vulnerable users. The MaaS technology platform offers a mechanism by which other sectors (from health, education, social care sectors) can provide funding for discounted travel by their vulnerable client groups.
BC7: Provide Training and Assistance Human intervention to support independent travel by vulnerable users	BC7_S1: Providing staff awareness training to increase confidence and safety in using public transport services BC7_S2: Providing travel assistants to enable use of public transport services	To increase uptake by some vulnerable users of public transport services requires addressing confidence and information barriers through human interventions ensuring that staff and volunteers who are in contact with vulnerable users have a means of recognising them, have a good understanding of their additional needs, and have knowledge of how to best deliver service to them. This includes greater recognition that less visible disabilities such as autism, dementia or anxiety can be just as much of a barrier to travel as a visible disability. The types of solution this can relate to include delivery of training to staff and/or to volunteers on interacting with users who have complex needs, introduction of some mechanism for identifying yourself as a user with complex needs, and empowering vulnerable users to travel independently by providing them with travel assistants to help them and teach them how to use the transport services in a safe manner and with confidence. This is anticipated to not only increase patronage but also reduce the need for sperate specialist transport provision/budgets.
BC8: Tailored Information Technology and other information solutions to support independent travel by vulnerable users	BC8_S1: Tailored information (visual or audio) to raise awareness of options available or provide journey assistance BC8_S2: Tailored mobile applications to reduce information barriers thereby increasing uptake and usability	Tailored information in the form of printed materials that are easy to understand by vulnerable users is important to raise awareness of travel options available to vulnerable users with specific requirements and who do not have access to information via mobile apps. This also includes information made available at stops/stations and in-vehicles. Additionally, tailored audio and tactile (e.g. braille) information can provide valuable assistance to vulnerable users with reading or sight impairments. Information solutions in the form of mobile applications can reduce information barriers, thereby increasing uptake and usability. Technology can also be applied to improve the quality of information that is made available to vulnerable users on the travel and mobility choices that are available to them, with the information tailored to their capabilities. Using technology to provide information tailored to their needs can empower vulnerable users to help them to travel independently in a safe manner and with confidence. This has the potential to reduce the need for separate specialist transport provision/budgets and also facilitates more intermodal journeys.


Accessible vehicles strategy
Exploit the power of data
Asset sharing models
Expand ride sharing
Encourage new collective services
Discount payments through MaaS
Provide training and assistance
Tailored information
More Independent Travel
More Integration
More Sharing
More Choice
Public Sector Priorities based on SUMP 2.0 guidance:
1. Enhance accessibility and quality of life
2. Ensure social equity
3. Increase economic viability

BC1_S1: All public transport bus services to be fully accessible

BC2_S1: Crowdsourced data capture to identify where improvements to PT services are

BC2_S2: Big data analysis to better identify where demand for transport services

BC3_S1: Asset sharing in rural or peri-urban areas where the users of the asset are individual members of the public

BC3_S2: Asset sharing of buses where the users of the asset are organisations providing a service for members of the public

BC4_S1: Public-private partnership ridesharing services using shared

BC4_S2: Peer-to-peer ridesharing services

BC5_S1: Commercially viable collective transport services that better meet vulnerable user demands

BC5_S2: Not-for-profit collective transport services that better meet vulnerable user demands

BC6_S1: New forms of subsidised travel through MaaS

BC7_S1: Providing staff awareness training to increase confidence and safety in using public

BC7_S2: Providing travel assistants to enable use of public transport

BC8_S1: Tailored information (visual or audio) to raise awareness of options available or provide journey assistance

BC8_S2: Tailored mobile applications to reduce information barriers thereby increasing uptake and usability

Figure 7 Illustration of the business concepts and associated business scenarios

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

5.2 Business Concept 1(BC1) - Accessible Vehicles Strategy

This Business Case pertains to removing accessibility barriers that prevent vulnerable users utilising conventional Public Transport services by ensuring these operate with fully accessible vehicles. This will ensure that wheelchair users and those requiring low floor access to vehicles can access the conventional public transport network rather than rely on limited and expensive to provide specialist client transport services for health or social service clients. Other vulnerable users to benefit are families with buggies.

5.2.1 Example Business Model solution for BC1_BS1: All public transport bus services to be fully accessible

Within INCLUSION, there are many case studies that cover this mobility gap and consequently it is of significant importance among the scope of the project. The Florence Pilot Lab (PL) is addressing this lack of accessibility and therefore it is especially meaningful to study the application of this Business Concept in the Florence context. The Florence INCLUSION Pilot Lab, coordinated by BUSITALIA, is included in the area covered by Metropolitan Florence Authority and consists of two separate sub-areas:

- Pilot Area 1 is included in the metropolitan area and consists of a peri-urban area located in a hilly area with stable employment and population. The target groups of this area are low-income families and immigrants who use public transport mainly for commuting or to go to social facilities.
- Pilot Area 2 is located in San Piero a Sieve, located in the centre of the Mugello area, on the northern boundaries of the metropolitan conurbation, which is an accessible small town also located in a hilly area with stable population and mixed economy. The target group for this area are the rural residents around the town who want to reach the railway station of San Piero a Sieve, which connects with Florence city centre and plays a role of fundamental importance for the mobility of the whole Mugello area. Only few services reach the railway station.

Conventional services are provided by BUSITALIA and ATAF (controlled company of BUSITALIA) within the service contract subsidised by the Regional Government (for the metropolitan area) and the Metropolitan Authority. Hence, the services offered by BUSITALIA and ATAF aim to improve the inclusivity of transport in these areas. Their experience with bus services helped build the following Business Model addressing the concept of "All public transport bus services to be fully accessible".

BC1_BS1: All public transport bus services to be fully accessible

BM Canvas Table

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

1- Market & Customer Segments

Segmented customers: These users have slightly different needs and problems, sharing the fact that they do not tend to use the service because of accessibility issues.

User needs:

- Customers for this BM have the need, at least to some extent, of having **accessible** PT services in order to travel independently
- Due to the difficulties of these users to use PT services, they have the need of feeling more **empowerment** in the society
- There is a need for trust towards PT services due to the lack of **reliable** features in certain PT services.

2- Vulnerable Users & Prioritised Areas

Vulnerable users in wheelchairs who cannot board buses without low floor and wheelchair space.
Vulnerable users with mobility impairments who cannot access buses with steps (e.g. elderly).
Vulnerable users with buggies who cannot board buses without low floor and wheelchair space.
Sensorially disabled users

3- Social Demographic Barriers

Distinction between urban area and rural area: all urban buses are equipped with ramps, whereas only a part of the fleet of suburban buses have these requirements (user has to call to be sure to have the right bus)

Difficulty not only in the vehicle but also at the bus stops. Especially in the rural areas, some bus stops are located in contexts of difficult accessibility.

4- Value proposition

- to adapt existing services to offer adequate and affordable options and more independence to more vulnerable user groups
- to offer universal design to benefit all other passengers with same comfort, safety, capabilities and dignity when using PT.

5- Mobility Gaps Addressed

Adequate vehicle and station design for vulnerable users' requirements.
Lack of reliability on the service because of accessibility barriers.

6- Communication & engagement

Vulnerable users can access relevant information via the PT company website and for additional information needs they can contact a service representative where they can get all the information they require.

Clear signalling of the accessibility improvements to welcome vulnerable users.

Personal assistance available when users require it.

9- Key Resources

Accessibility features in vehicles where needed (physical and financial)
Human resources for understanding, communicating
and fulfilling vulnerable users' needs

10- Key Partners & Activities

PT operators: Identify where supply of accessible vehicles does not meet the demand.

Authorities: Develop the service contract with accessibility requirements and award it.

PT operators: provide service and vehicles according to the contract specification.

Public-sector authorities: monitor performance and adherence to contract conditions.

7- Organisational & Operational context

Operating in the framework of the regional service contract, these services need to provide vehicles suitable for access by people with disabilities. It is suggested that accessible vehicle specifications are included in service contracts awarded to public transport providers. EU Directive 2004/18/EC (Article 26) specifically allows public authorities to introduce contract performance requirements relating to social and environmental considerations. It is recommended that this be used as a means to encourage transport providers to submit tender bids that include 'added value' components (e.g. accessible vehicles and staff awareness training) which address the needs of vulnerable users.

12- Cost Structure

Costs are related to bus equipment, including ramps and space for wheelchairs and low floor vehicles.

8- Revenue Streams

Revenue streams depend on euro/km established from the Service Contract. If the Service contract includes accessible vehicles, the euro/km can be greater. Improving the ability of vulnerable users to travel on the conventional public transport network can result in fewer trips by vulnerable users on specialist door-to-door services, thus saving public sector spending which can be diverted to finance the increased service contract costs.

15- Social Innovation

Transport system designed for "inclusive for all mobility"

13- Inclusion Principles/Goals

Accessibility, Empowerment, Reliability

14- Technology

Adapted vehicle & station technologies (ramps, special seats, security features for wheelchairs…)

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

Expanded description of key BM features

- Lack of accessible PT services

This BM represents the delivery mechanism to ensure that accessible vehicle specifications are included in service contracts awarded to private sector providers in regulated environments. If these specifications are not complied with, vulnerable users are not encouraged to use these services and do not feel included in the PT network. To address this matter, equality legislation requires all bus, rail and taxi vehicles available to the public to be accessible to disabled persons with a range of impairments by 2020. For this BM example, operating in the framework of a Regional Service Contract must guarantee some forms of accessibility, not only in terms of vehicles but also the accessibility of bus stops, which are more difficult to reach because of territorial limits. This is an important consideration, since if the Service Contract Framework does not include forms of accessibility, companies with accessible vehicles may be disadvantaged.

- Organisational & Operational context

PT services provided by the private sector in non-commercial environments are established with no on-road competition (there is competition at the tender stage). Therefore, there is a need to ensure vulnerable user requirements are incorporated within these tender specifications. On the other hand, for deregulated environments, commercially viable services operated by the private sector do not involve service contracts and the public sector can only work with the private sector to encourage them to adapt services for vulnerable user's needs. Involving private sector providers in engagement with users can aid in this process. However, the public-sector influence is limited to providing guidance on good practice and on reasonable adjustments for vulnerable users in addition to monitoring that legislation is adhered to.

Challenges and opportunities:

Actor	Challenges	Opportunities
Public sector	Necessity to continuously research about the vulnerable user needs and how they evolve. Service contracts can last many years (7-10 years in some cases) and so introducing new accessible vehicle requirements to service contracts can only take force at contract renewal and so changes can take a long time to become implemented.	Adapting legislation and service contract requirements according to the evolution of vulnerable users' needs to create a big impact in accessible transport service providers.
Private sector transport provider	Need for investment to have accessible vehicles in fleets. Continuous change of legislation may lead to new vehicle adaptations.	Improved competitiveness in providing accessible transport services. Addition of social component to services that enhances the value of the company.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

Users	Vulnerable users' adaptation from specialised transport services to using conventional accessible PT services.	Feel more included in the society by using conventional PT services.

Link and synergies with other Business Scenarios:

- BC3_S2: Asset sharing of buses where the users of the asset are organisations providing a service for members of the public

As service contracts in rural areas only apply to a small number of services providing a very limited coverage, other approaches to ensuring accessible vehicles are used for other forms of public transport are also required. This is the case of asset sharing of buses where the users of the asset are organisations providing a service for members of the public. The synergy between all PT bus services being fully accessible and the asset sharing model for use by a local community should complement each other and create a fully accessible network of services in rural and peri-urban areas where demand exists.

- BC7_S1: Providing staff awareness training to increase confidence and safety in using public transport services

Including accessible vehicle specifications in PT services is a major component when picturing "inclusive for all" mobility, as it encourages vulnerable users to use this service and hence feel more included in the society. To complement the accessibility of the vehicles, it is essential to provide staff awareness training to increase user confidence and safety in using PT services, which will also increase the confidence of vulnerable users. These two concepts are strategically linked and should be considered hand in hand when designing accessible mobility solutions to ensure all vulnerable user mobility needs are met, thus increasing their empowerment in society.

- BC7_S2: Providing travel assistants to enable use of public transport services

The inclusion of accessible vehicle specifications in PT services together with heightened awareness training of staff addresses many vulnerable users' needs when using these services. However, for vulnerable users with more complex sensory disabilities and cognitive/mental health impairments these concepts can only go part of the way to giving them the confidence and capability to travel independently. Therefore, the concept of providing travel assistants to enable use of public transport services should be introduced to provide extra support to those with more complex needs.

Social and Demographic Barriers:

The table below describes the key barriers per each target users considering social and demographic factors:

Target users	Social Factors	Significant barriers
Users in wheelchairs (disabled) Users with mobility impairments (elderly, disabled)	Lack of trust/confidence	Users in wheelchairs and with mobility impairments can experience many social barriers. Although this particular PT service may be designed to cater their needs, it is likely that these users may not have full confidence in using all services in their end-to-end journey, including return services or interchange infrastructure, due to the complex needs and capabilities of each individual user.
	Willingness to change habits Aversion to uncertainty	Users who typically travel by private door-to-door transport services may experience a barrier when planning to switch to using accessible PT services and the related uncertainty that this may give rise to.
	Fear of personal insecurity Lack of empathy Attitudes and cultural acceptance Lack of social interaction	The complex needs and capabilities of the vulnerable users may be sometimes hard to understand by other users. This creates a barrier when using collective transport services, since vulnerable users may feel insecure or that people with whom they interact are not empathetic.
Users with buggies (young children)	Willingness to change habits Fear of personal insecurity Lack of empathy	Families who are travelling with baby buggies may experience a potential barrier when they plan to travel by accessible PT services, especially if they usually travel by private vehicle. The fear of insecurity of the children and the possible lack of empathy of other travellers are potential causes for this barrier.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

5.3 Business Concept 2(BC2) - Exploit the Power of Crowdsourced Data

The emergence and widespread uptake and use of mobile technologies and social media platforms establishes an environment where individuals are exchanging information on all sorts of subjects. This business concept looks to develop tools whereby information on vulnerable users' mobility demands and needs can be exchanged, captured and analysed. This information is then utilised by transport planners and providers to deliver more efficient and effective services and more integrated planning decisions.

Two different scenarios emerge for this concept:

1. Using mobile apps to collect crowdsourced data from vulnerable users to identify where improvements to PT services are needed.
2. Analysis of social media data to better identify where vulnerable user demand for transport services exists.

5.3.1 Example Business Model solution for BC2_Scenario1: Crowdsourced data capture to identify where improvements to PT services are needed

This specific Business Model has been designed based on the Budapest Transport Centre (BKK) experience in Budapest. BKK, owned by the Municipality of Budapest, prepares and implements Budapest's transport strategy. This includes enforcement of aspects of sustainability and equal opportunities in the operation and development of transport: integration and supervision management of the Budapest transport sectors, in particular public and road transport; validation of aspects of pedestrian and bicycle transport; and coordination of district municipal, utility and other investments in road and public transport.

The gaps to be addressed in the pilot were related to the partial accessibility of the public transport system in Budapest. This pilot focused on social groups that have reduced mobility and do not have equal opportunities to access and use public transport. The actions implemented by BKK have been to (i) provide overall knowledge and training of public transport employees who are in daily direct contact with the clients, about the transport related needs of people who are reduced in their mobility; and (ii) to develop an online, public platform for reporting problems, barriers and needs related to the accessibility of public transport in Budapest, with the aim of identifying and understanding the mobility needs and accessibility conditions of the target groups, and to strengthen the involvement of citizens.

BKK has developed this Business Model following the delivery of the on-line crowdsourcing platform for reporting problems. It is focused on the development of a web-site and app called: Járókelő.hu. This app can collect insights from any user but is most useful in helping capture vulnerable user experiences and issues. The users can report their needs (e.g. lack of wheelchair spaces, driver attitudes and awareness levels, bus cleanliness, etc.) or share information amongst other users through their smartphone. All information captured by the App is sent back to BKK for subsequent action.

inclusion

BC2_BS1: Crowdsourced data capture to identify where improvements to PT services are needed

BM Canvas Table

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

1- Market & Customer Segments

Mass Market: This BM is focused on the mass market since it is available to all users and not just vulnerable users. The App is designed in an inclusive way to cater for all vulnerable users' needs, regardless of the target user group.

User needs:

- Vulnerable users that experience problems and difficulties when using conventional PT services and can voice and share these in order to feel **empowerment** and **empathy** within society, building trust towards PT services.
- Vulnerable users usually experience more barriers to travel than other users, and so there is additional need to create a **convenient means** for communicating these issues.

2- Vulnerable Users & Prioritised Areas

Vulnerable users such as those with temporary or permanent disabilities /impairments (people with mobility impairments, elderly, cognitive and sensorial disabilities, families with young children, visitors etc.) who can provide information to transport authorities about issues such as lack of wheelchair spaces, driver attitudes and awareness levels, bus cleanliness, accessibility issues at stops and stations, difficulties purchasing tickets, etc. Everybody is a potential user.

3- Social Demographic Barriers

Not all vulnerable users are able or comfortable with using mobile apps.

Transparency is very important to achieve a sentiment of trust.

4- Value proposition

- Value proposition to use crowdsourced information from bus passengers using smartphone apps to inform bus providers and/or public sector transport authorities of issues faced by passengers when using their services (more service planning, service delivery and improve customer relationship management).
- Transport authorities better understand user needs and issues and can prioritise maintenance and improvements.
- Value proposition to share information amongst other users to allow passengers to help each other (improve passenger experience)

5- Mobility Gaps Addressed

Vulnerable members of PT with Lack of information (frustration)
Better understand the habits, preferences and needs of passengers.
Improve access and safety concerns.
Remove barriers and inconveniences to travel.

6- Communication & engagement

Engage with the private sector to enhance their travel information apps to capture user needs, and to share these needs with public sector transport authorities who need to commit to invest time and budget to make necessary improvements.

Develop public campaigns and advertising at stations, stops, PT vehicles

Involve NGOs stakeholders during the app development process and monitor the different announcements.

Website version is important, many users look at their announcements via web browser on their personal computer or mobile device.

9- Key Resources

Crowdsourced data collection platforms.
Non-personal data collected from transport systems.
Already available solutions.

10- Key Activities

Crowdsourcing information to identify vulnerable users' needs and using this information for every day's planning. Building database and categorize the data. Design workshops involving stakeholders to understand and validate their needs

11- Key Partners

- Journey planners and travel information apps (crowdsourced data collection can be integrated there)
- Public sector transport authorities.
- PT providers
- Other stakeholder such as NGOs, local organisations, etc.

7- Organisational & Operational context

Delivery of the solution: Predominantly through private sector technology companies and, in some cases, public-private partnerships provide a suitable mechanism to deliver these crowdsourcing app technologies where the public sector pays the private sector technology company to implement their app for citizens in their city, with the public-sector benefit coming from the data generated which helps inform planning decisions that can improve future service provision for vulnerable users.
If Public Transport services are better (with good journey planners, problem report systems) more people will use it. It helps to reach sustainable urban environment, targets of a City or Region Mobility Plan (SUMP)

12- Cost Structure

Crowdsourcing app development and maintenance
Data analysis costs
Marketing to end users
Significant costs incurred by transport authorities or providers to improve infrastructure or adjust service provision in response to user feedback.

8- Revenue Streams

To improve the network service and travellers experience. This fact can push citizens to use more PT and, consequently, to have more revenues from the PT tickets purchases.

The information captured can inform more effective planning decisions in other sectors such as roads and infrastructure and so interdisciplinary cross-sector funding could be attracted for the commissioning of such services.

15- Social Innovation

Users can inform about possible infrastructure and services improvements according to their needs.

13- Inclusion Principles/Goals

Empowering, Accessible, Convenient, Empathetic

14- Technology

Technology solutions that make travel easier for certain vulnerable users

Expanded description of key BM features

- Key partners and engagement

The information captured through crowdsourcing apps can also inform more effective planning decisions in other sectors such as roads and infrastructure, and so interdisciplinary cross-sector funding could be attracted for the commissioning of such services. The information from crowdsourcing apps helps to identify priorities for allocating limited budgets to make improvements as well as identifying quick and inexpensive fixes. As a result, in most cases it is likely that public private partnerships provide a suitable mechanism to deliver these crowdsourcing app technologies where the public sector pays the private sector technology company to implement their app to citizens in their city, with the public sector benefit coming from the data generated, which helps inform planning decisions that improve future service provision for vulnerable users. Other stakeholders such as NGOs or local organisations will have two roles: (i) participate during the design phase of these apps to ensure that the apps will be accessible for all the vulnerable users; (ii) incentivise and help vulnerable travellers explaining to them how to use these apps. These two actions will guarantee the sentiment of trust among the users.

Challenges and opportunities:

Actor	Challenges	Opportunities
PT Operator	Development of a solution that may not be usable for certain vulnerable user groups (e.g. digitally excluded). Obtaining crowdsourced data that needs to be transformed into action. This is not always possible due to budget constraints.	Direct channel of information with vulnerable users to identify their mobility needs.
Technology providers	Collection of massive amounts of data that need to be processed and prioritised.	Enlarge the market segment of data collection techniques by their application in transportation studies.
Community organisations	Capture the needs of users who are unwilling to use these platforms thereby ensuring their needs are also taken into account.	Direct channel with PT operator to highlight the mobility needs from users that they represent.
Users	Vulnerable users need to adapt to new technologies for sharing their needs.	All vulnerable users' needs will be considered when improving PT services, enhancing empowerment.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

Link and synergies with other Business Scenarios:

- BC8_S2: Tailored mobile applications to reduce information barriers thereby increasing uptake and usability

The crowdsourced data capture to identify where improvements to PT services are needed requires the development of an app that is specially designed with attention to the needs of vulnerable user groups. BC8S2 targets the tailored mobile applications to reduce information barriers, thereby increasing uptake and usability. For this Business Model, the inclusive design is critical as BKK aims to ease the process of gathering vulnerable users' insights through the app and guarantee transparency on the information management to transmit a sentiment of trust with these users.

Social and Demographic Barriers:

Target users	Social Factors	Significant barriers
Users with cognitive impairments (elderly, disabled)	Ability to use technology	Lack of digital knowledge to understand how the app works.
	Ability to understand information Ability to communicate	Cognitive impairments lead to not understanding what information is being provided as well as not being able to clearly communicate their needs.
Non-residents (migrants, tourists)	Ability to understand information Ability to communicate	Having the App only in local languages creates a barrier for non-native speakers when they use the App.
All users	Lack of trust/confidence	A potential barrier is created if the users of the App do not trust the service enough to provide their personal data or information.
	Lack of empathy	The users may not feel confident in the service if the feedback they are providing is not taken into account and a solution is not provided. Especially if the authorities do not reply to their feedback.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

5.3.2 Example Business Model solution for BC2_Scenario 2: Big data analysis to better identify where demand for transport services exists

This business model describes development of ICT tools that allow improved estimation of unpredictable transport demands, such as demands to non-regular events or tourist sites. The development of this business model is based the INLCUSION Pilot Lab measures introduced in the peri-urban and rural areas of the Barcelona Region. It is centred on analysis of Twitter data to estimate PT demand for a music festival on the outskirts of Barcelona. BusUp (a PT service provider) and the event organizer (Canet Rock) benefit from this by gaining a better understanding of the mobility demand to the event (in terms of geographical location) so as to be able to offer more tailored bus routes to increase the overall transport accessibility of the event. The demand analysis has been undertaken by Mosaic Factor Ltd., a technology company specialising in Big Data and Artificial Intelligence for mobility and logistics.

BC2_BS2: Big data analysis to better identify where demand for transport services exists

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

1- Market & Customer Segments

Mass market: This service is focused on all potential attendees of an event or attraction. Concretely, this BM, applied to a music festival, considers especially young people and women who do not have a feasible alternative option (no car or drivers' license) and live in areas with limited PT services wishing to attend cultural, leisure or sports event in areas also poorly served by PT.

User needs:

- The users of this service have need for an **accessible** and **affordable** transport service alternative compared to expensive and private services.
- The fact that these users might not feel included when designing transport services without their needs being taken into account creates the need of boosting their **empathy** and **empowerment** feelings in society.

2- Vulnerable Users & Prioritised Areas

Occasional group of travellers (particularly young people, students and women) moving as individuals or small groups, travelling to common destinations such as music festivals.

Rural and peri-urban areas without easy PT connection to traveller destinations.

3- Social Demographic Barriers

Areas where there is limited PT (inflexible, infrequent during night-time or with bad public transport connectivity).

Not all people use online social media platforms and demographic disparities may introduce unintentional bias into planning and operational decisions.

4- Value proposition

Value proposition to identify potential demand (numbers and location) for improved design of commercial collective on-demand transport services.

Better comprehension of unpredictable travel interests, desires and needs.

Identification and aggregation of demand to large scale events.

5- Mobility Gaps Addressed

When there is limited PT, target users are restricted to either taking their own car (if it is possible and assuming safety risks) or not going to the festival.

6- Communication & engagement

Communication

Event/attraction organisers webpage
Social networks advertisement
On-demand bus service provider website
Direct e-mail to the attendees

9- Key Resources

Social media data (Twitter data in the Barcelona example) and complementary data such as demographic data, transport connectivity data, etc.
IT system to develop data analytics

Bus/coach providers to contract the work to

10- Key Activities

Identify where demand exists and design new collective services according to this.

To contract the new collective services to local bus/coach provided

11- Key Partners

Private sector technology providers developing data analytics
On-demand transport provider
Local coach/bus companies
Festival organiser

7- Organisational & Operational context

Private sector technology providers develop digital solutions, based on analysing large quantities of readily available data from digital social media, play a part in the process of identifying the potential for, and design of, commercial collective transport services. E.g. identification of travel interests, desires and needs by analysing available non-structured Twitter data and the Twitter relations among users; this analysis will be complemented with other datasets such as demographic or transport connectivity data.

12- Cost Structure

Data collection cost, data analytics tools and digital infrastructure cost
Contract costs to bus/coach operators.
Marketing and communications to users.

8- Revenue Streams

- If commercially viable: Private sector bus operators commission use of data analytics tools to inform the design of the bus service to serve the areas/routes with highest demand identified through social media. Revenues in this case are generated entirely from passenger fares.

- If not commercially viable: Public-private partnership funding may be suitable for commissioning the use of the data analytics tools and contracting services where there is an identified social value in providing the service

15- Social Innovation

Potential demand identification through social media analysis

13- Inclusion Principles/Goals

Accessibility, Affordability, Empathy, Empowering

14- Technology

Data analytics to identify potential demand

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

Expanded description of key BM features:

- Mobility Gaps

Transit authorities prioritise infrastructure investment in urban centres, which are more densely populated and amenable to public transportation with frequent, regular stops. There is a mounting demand for transport services to, from and around peri-urban areas, however, the mobility services offered in these areas suffer from several weaknesses. Public transport services are typically operated on a radial routes structure linking peripheries and the metropolitan centres. These services are inflexible and often infrequent, in particular during the night, and do not meet the needs of citizens in the outskirts / peripheral areas of cities and their neighbouring towns. Therefore, it can be extremely difficult for peri-urban and rural dwellers to access attractions/events located outside the urban centres, especially for evening activities. The car becomes the only option, but for young people and other vulnerable users this is very often not an option. Analysis of social media data can establish locations where clusters of demand can support collective bus services that can overcome these mobility gaps.

- Organisational & Operational Context

The transferability of this approach to other scenarios needs to be considered carefully. Three characteristics have been identified as factors in contributing to its successful applications: (i) gaps in knowledge of demand: one-off or annual events where attendees are changing/not known in advance are especially suitable; (ii) social media active target groups; and (iii) shortage of suitable exiting transport options for the target groups.

Challenges and opportunities:

Actor	Challenges	Opportunities
Technology providers	Data policies uncertainty when analysing social media. Use of the most adequate mining techniques to be able to interpret this non-structured information. Quantity and quality of data is often not optimal for the development of the solution. (e.g. lack of geolocation).	Enlarge the market segment of social media data analysis techniques by their application in transportation studies. Ability to identify potential demand for transport services.
On-demand PT Operator	Provide non-commercially viable services where there is low demand, or the total demand is partially unknown.	Design of services that meet vulnerable users' needs can be aided using this technology. Commercially viable services can be established even in lower density areas.
Users	Not having access to Social Media may lead to not being represented when studying different transport options to attend the event.	Previously unknown demands taken into account when planning on-demand routes.

		More young people can access leisure or socio-cultural events without reliance on parents driving them. Promotes independent and inclusive travel opportunities.

Link and synergies with other Business Scenarios:

- BC5_S1: Commercially viable collective transport services that better meet vulnerable user demands

By developing social media analysis to identify potential demand from users who want to attend a socio-cultural event, the success rate of the proposed routes in terms of publication and confirmation can be increased, resulting in increasing number of tickets sold, and more targeted stops and direct routes. This will allow the service operator to reach more municipalities, thus allowing more vulnerable user groups to access destinations using this service who would otherwise not have been able to attend.

Social and Demographic Barriers:

Target users	Social Factors	Significant barriers
Users who live in remote areas without a good PT connection Users who do not own a car	Willingness to change habits Willingness to share	A barrier appears when these users typically travel by car or by conventional PT services and they are not willing to switch to demand-based transport services.
All users (particularly young people and women)	Lack of social networks Lack of ICT infrastructure Ability to use technology	For the case of users without social networks, without proper ICT infrastructure or unable to use new technologies, there is a barrier related to not being able to identify such demand through social networks.

5.4 Business Concept 3 (BC3) - Asset sharing models

Asset sharing is when vehicles (scooters/bikes/e-bikes/mopeds/cars) are collectively owned (by the municipality, local company or community group) and are made available for shared use by either individuals or local groups. Asset sharing models can provide more travel choices to users without the need for private ownership and can foster cooperation between sectors and hence reduce sector specific dedicated services, resulting in more cost-effective delivery.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

Two main scenarios related to asset sharing can be defined according to the users of the asset, type of asset and the type of area.

1. Asset sharing where the users of the asset are individual members of the public
2. Asset sharing of buses where the users of the asset are organisations providing a service for members of the public

5.4.1 Example Business Model solution for BC3_Scenario 1: Asset sharing in rural or peri-urban areas where the users of the asset are individual members of the public

The specific Business Model related to this concept has been designed based on the HITRANS (Regional Transport Authority for the North of Scotland) experience in the INCLUSION Pilot Lab in the Cairngorms National Park (CNP), a large, hilly and diverse area that presents numerous public transport challenges: i) Low density and dispersed population results in sparse PT service coverage, ii) Infrequent services and longer journeys, iii) An aging resident population in the area and iv) A large number of tourists in the summer and in the short ski season.

In peri-urban and rural areas the demand from individuals for collective asset sharing services is not sufficient for commercially viable operation from private sector providers. As a result, financial support is required in some form or other to establish collective asset sharing services. This financial support offers the leverage to ensure asset sharing services are designed and delivered with certain vulnerable user needs in mind.

The following business model is based on the approach established within the INCLUSION project for the delivery of an e-bike sharing scheme in the Cairngorm National Park.

BC3_S1: Asset sharing in rural or peri-urban areas where the users of the asset are individual members of the public – VEHICLE SHARING

BM Canvas Table

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

1- Market & Customer Segments

Mass Market: Since this BM is addressed to the whole population of rural and peri-urban areas, the customer segments are focused on one large group of customers with broadly similar needs and problems (that are related to convenient and accessible transport modes).

User needs:

- Target customers for this BM find some trips infeasible if they do not have access to conventional transport modes, creating the need to improve their **accessibility** to certain places.
- Therefore, with the implementation of asset sharing schemes, their need for **convenient** transport modes can be fulfilled for some trips.
- The lack of transport options for the users to perform certain trips creates the need to improve their **empowerment**.

2- Vulnerable Users & Prioritised Areas

Young people, students and tourists who need a short-term hire for a certain activity.

Active elderly for social and leisure/fitness purposes (in the case of e-bikes).

Residents suffering from fuel poverty due to high rural fuel costs.

People who are unemployed who need long term hire to access job opportunities or training.

3- Social Demographic Barriers

Complexity of travel options.
High car ownership and low public transport use.
Difficulties for visitors to use public transport for travel to and in the region.
Population variation and isolation.

4- Value proposition

Short term hire: Provide more affordable & accessible alternative travel around rural areas by offering a shared mobility service.

- To improve the experience of more sustainable travel options that may not be considered.
- To provide a profit-making service to tourists in order to cross-subsidise use by locals

Long term hire: Offers the possibility to have a flexible transport mode for a temporary period.

- To access specific training, or to help unemployed locals access job opportunities with the ultimate aim of purchasing their own transport once they can afford it.
- To provide active transport to aid recuperation from injury or illness (in case of e-bikes).

5- Mobility Gaps Addressed

Improvement of accessibility
More active travel options

6- Communication & engagement

Advertising to let vulnerable users know about existence of these services.

TV advertising
Radio advertising
Newspaper advertising
Local community centres and hubs

Marketing to visitors / tourists where applicable.

Utilise promotion at public transport interchanges.

Build partnerships with local businesses to promote the use of the shared asset amongst their staff / clients.

9- Key Resources

Fleet of shared vehicles (e.g. e-bikes, mopeds, cars)

Premises to offer vehicle hire services

Local businesses that can provide in-house maintenance.

10- Key Activities

Maintenance and management of services (e.g. through partnership with local businesses).

Partnership building for local referrals

Identify where the infrastructure allows to implement these services

11- Key Partners

Public authorities

Private sector partners or community organisations / transport providers

Social enterprise companies.

7- Organisational & Operational context

Delivery through Public-Private Partnership arrangement: Public sector to purchase assets; private partner with premises and employ existing office/admin to host and operate the service. This form of partnership is effective where staff input is limited to managing the service and no driver costs are incurred. Private sector partner is a local business, preferably with in-house maintenance capability, and has strong presence in the local community and can act as the 'local champion' for the service. This could also be done by social enterprise companies in place of private sector partner in some circumstances.
Both public and private sector partners work with employment, health and social care sectors to identify vulnerable users who would benefit most from a longer-term hire (particularly in non-tourist season).

12- Cost Structure

Asset purchase (from public sector)
Operating costs (from user revenues)
Maintenance and management (from user revenues and possibly partnership funding)
Marketing

8- Revenue Streams

Revenue from users' payments (premium charges for tourist use)
Private sector partners receive maintenance and management revenue from the public entity and indirect sales of merchandise to e-bike scheme users. Sponsorships from local businesses
l

15- Social Innovation

Referrals from local community businesses and service providers (e.g. health services) for staff/client use of shared asset.

13- Inclusion Principles/Goals

Accessible, Convenient, Empowering

14- Technology

Booking technology for hiring asset. Some partnerships allow In-shop booking without technology.

Expanded description of key BM features:

- Organisational & Operational context

In urban areas, asset sharing schemes are predominantly operated by the private sector on a commercial basis due to high demand. However, rural and peri-urban areas do not show sufficient demand for commercially viable operation from private sector providers. Hence, financial support is required in some form or other to establish collective asset sharing services. The approach described in this business model is through public private partnership where the public sector purchases the shared assets and partners with private sector or social enterprise companies that own suitable premises and staff to host and operate the service. Where public private partnership funding is used to pay for the asset (e.g. bikes or e-bikes) and for maintenance of these, the private sector provider cannot make direct profit from the operation of the service but can profit from indirect sales of merchandise to the bike-share users. This condition is due to state-aid rules which places limitations on the operators and operation of these services when public sector funding is used to finance part of the service delivery. In the case of bikes or e-bikes, the partnership with private sector organisations is suitable where the assets being supplied are hired from commercial bike shops.

For assets that require more set-up and on-going involvement (e.g. higher maintenance) only larger scale schemes where management and maintenance overheads can be spread across a critical mass of users can operate without additional subsidy. This requires a more dedicated form of provision and in such cases social enterprise companies focused on delivering moped or car-share brokerage schemes on a not-for-profit basis are more suitable. The key to these social enterprise schemes is that the hire is for longer periods of time (several weeks or months) and the user is charged (and can afford) the full costs of use, including maintenance and depreciation costs. These longer-term hire services are typically designed to help job seekers access to employment not serviced by public transport and are most suited to younger persons, including women, requiring independent means of travel. In addition to accessing jobs, once hired these services provide transport for use at times when needed, eliminating waiting time and offering direct travel to other destinations.

- Vulnerable users with disabilities

Bike and e-bike schemes are only suitable for physically able vulnerable users, although e-bikes have begun to become very popular among the active old population. In the Cairngorms National Park, the local bike shops have arrangements with local health practitioners who refer patients who would benefit from use of the e-bike (e.g. those with hip, knee and respiratory conditions) many of whom are able older people. In addition, the transport authority is working to extend the e-bike scheme to older and less able users through introduction of e-trikes, in partnership with both the local bike shops and local care homes. However, for some disabilities, bikes or e-bikes will not provide a suitable option and in such cases other asset sharing schemes such as car clubs with adapted vehicles (e.g. hand control driving devices) may provide a better solution.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

Challenges and opportunities:

Actor	Challenges	Opportunities
Public Authorities	Choose correctly which types of asset to purchase that meet the needs from each area. Difficulty of deploying such a service in rural areas without a commercial environment.	Fill the mobility gaps that are left by limited conventional PT services in rural and peri-urban areas. Provide sustainable and active transport modes to rural and peri-urban dwellers and consequently reduce car ownership.
Private sector service providers	Adaptation of facilities to provide maintenance and management of the services. Carry out operation of the service (i.e. booking, asset control).	Increase in the number and type of people using bikes, and therefore buying merchandise. Many people who try e-bikes through shared hire scheme go on to purchase an e-bike.
Users	Change of behaviour by adapting to new mobility schemes that give less weight to private cars and enhance collective and sustainable transport options. Confidence in ability to use bike or e-bike (especially on road) for older persons or those with some physical disability.	More transport options that empower vulnerable users when traveling in rural and peri-urban areas. Sustainable transport options that help boosting active lifestyles. Health related benefits (for bike + e-bike services).

Link and synergies with other Business Scenarios:

- BC6_S1: New form of subsidised travel through MaaS systems

BC6_S1 concept stands for MaaS systems to be used by vulnerable users with personalised mobility budgets, placing the choice of transport mode and operator into the hands of the user. Such system is very adequate to offer vulnerable users all their possible mobility options and works more effectively with many different transport options included in the system. Therefore, the inclusion of the e-bike sharing service into the system would be a very suitable component of a MaaS service in rural or peri-urban areas where available transport options are more limited.

Social and Demographic Barriers:

Target users	Social Factors	Significant barriers
Young people, students and tourists who need a short-term hire	Willingness to change habits Willingness to share Lack of trust/confidence	Users that typically travel by conventional PT services or who use cars in rural areas might find a barrier when considering using new shared asset services with uncertain availability. Not being the owners of the transport mode that they are using might create some lack of trust or confidence.
Users that do not own a car	Willingness to change habits	
Active elderly users	Lack of confidence Ability to use technology	There may be a lack of confidence among non-cyclists that they can control an e-bike or that they are physically able to ride an e-bike. In certain cases, the technology used for the booking and payment of these assets, as well as the asset itself, create a significant barrier.

5.4.2 Example Business Model solution for BC3_Scenario 2: Asset sharing of buses where the users of the asset are organisations providing a service for members of the public

In rural areas, due to low demand, there is limited conventional public transport service provision and a lack of commercial services, resulting in a disjointed array of non-commercial community bus services operating. These tend to emerge to serve specific purposes where a gap in the conventional network is evident. This piece-meal approach results in poorly planned and poorly integrated services that are often restricted to particular trip purposes and are not designed with vulnerable users' needs in mind. Quite often they are introduced with very limited or no funding using available vehicles which are often not accessible. A different model of service delivery should be considered in rural areas.

Where it is not commercially viable or 'reasonable' for private sector providers to adapt vehicles to meet equality legislation and where community organisations cannot afford to purchase accessible vehicles, the public sector should consider providing grant funding to purchase or lease a 'pool' of high specification accessible vehicles of suitable sizes for the areas they serve to ensure the needs of vulnerable users are met. These should be provided under an asset sharing model for use by local community organisations.

This Business Model has been developed based on three examples featured in the WP3 case study review work. These are listed in the table below.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

INCLUSION examples	Comment	User Types	Area Types
4.8 Wensbus ("Wish bus") Limburg	Volunteer car or minibus (8 seat) service using a mix of volunteer cars or community owned vehicles; Grant funding + user fares supports operations; Grant funding also available for vehicle purchase; Replaces service contract routes	Elderly; People without driver's license	Rural
4.7 Mobuur neighbourhood service	Volunteer car service; Grant funding + member fees support operations; Vehicles purchased and leased by public sector	Elderly; Disabled; People without driver's license	Peri-urban
5.1 AVIRA wheelchair-accessible car sharing	Organisations with wheelchair-accessible cars share these with those seeking them; Utilises volunteer drivers; Uses matching software to link passengers with drivers and accessible vehicles; Grant funding to social enterprise organisation pays for scheme set-up/management.	Physically disabled;	Peri-urban Rural

BC3_S2: Asset sharing of buses where the users of the asset are organizations providing a service for members of the public

BM Canvas Table

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

1- Market & Customer Segments

Segmented customers: This service provides transport for users who require accessible vehicles, and in some cases door-to-door provision in order that they can travel.

User needs:

- Customers addressed in this BM have the need of more **accessible**, **affordable** and **safe** transport services that allow them to perform trips that are difficult to do when they cannot use other transport modes.
- The fact that these customers find these mobility gaps with the current available transport services create the need for improving their **empowerment** feeling.

2- Vulnerable Users & Prioritised Areas

Wheelchair users who cannot board buses without low floor access and wheelchair spaces;

Users with mobility impairments who cannot access buses with steps or cars with low seats;

Vulnerable users with buggies who cannot board buses without low floor and space for buggies.

Rural Areas

3- Social Demographic Barriers

Public sector clients unwilling to share trips with other users.
Public sector partners unwilling or unable to share or divert budgets for transporting clients.
Conflicting demands for use of shared vehicle.

4- Value proposition

To increase independence for wheelchair users/ mobility impaired/ visually impaired persons

To reduce expenditure on specialist door-to-door provision by social care, health, and education sectors for their client trips

Maximise the use of the 'pooled' accessible vehicles by making them available for use by any local organisation if needed

5- Mobility Gaps Addressed

Lack of accessible vehicles in rural areas
Provides accessible vehicles for use in door-to-door public transport and in integrating public sector client needs
Accessible vehicles for use by local clubs, charities, community groups

6- Communication & engagement

Must involve all public-sector partners and local organisations at planning stage to ensure correct vehicle specification and avoid conflicting demands in use of 'pool' vehicles. May require agreements in adjusting activity times for clients/passengers.

Communicate requirements to local organisations in booking procedures and use of the vehicles (e.g. driver requirements).

Need to communicate to vulnerable users any changes in routine for their trips – e.g. timings or if they now might be sharing with others.

9- Key Resources

The 'pool' of accessible vehicles

Staff time/resource for managing the hires, maintaining the cleanliness and roadworthiness of vehicles as well as providing safe vehicle parking space.

10- Key Activities

Plan what vehicles are needed

Purchase or lease of suitable vehicles

Hosting and managing the vehicle pool

11- Key Partners

Public sector transport authorities (supply the vehicles).

Community transport organisations (users + potential host for the vehicles)

Public sector client service providers in health, social services, education (possible users and commissioners)

Local clubs, societies, charities, local social enterprises etc. (potential users)

7- Organisational & Operational context

Public sector purchases a pool of variable-sized accessible vehicles for the local community to use on an asset sharing basis. Needed where there are no existing public-transport (PT) services or where flexible PT services are being considered to replace existing non-accessible, infrequent PT services. Joint planning between all stakeholders on the needs their clients/users is required to both ensure vehicle suitability, and to calculate the vehicle numbers required. Minor adjustments to timings of client activities can increase vehicle use and cost-efficiency. Organisations using the 'pool' vehicles must do so on an NFP basis and where there is no commercial competition for the trips. A local organisation is required to host the accessible vehicle 'pool' and manage hiring by local organisations. Community transport groups or local social enterprises are well placed to fulfil this role.

12- Cost Structure

Vehicle purchase or lease costs met by public sector Transport Authority with co-financing from public sector partners in health, social services or education if the 'pool' vehicles reduce budgets required for specialist transport provision to their clients.

Hosting and management costs of vehicle 'pool'. Could be delivered via public -community partnership agreement.

8- Revenue Streams

Vehicles hired out to local organisations to use on an NFP basis. Organisations pay a variable hire fee depending on the hiring organisation and the hire purpose (i.e. use fees charged to their passengers/clients). Public sector partners in health, social services, or education could receive free hire if co-funding vehicle purchase/lease. Organisations hosting the vehicle pool could receive free or reduced hire use in return for lower hosting/management costs. Also consider sponsorship potential by local businesses.

15- Social Innovation

NFP organisations (community transport groups, charities, social enterprise companies) have use of accessible vehicles as/when needed.
Volunteer drivers can be used depending on vehicle and service type

13- Inclusion Principles/Goals

Accessibility, Safety, Affordability, Empowerment

14- Technology

Low level technology for booking system to hire vehicles and/or to allocate clients to services using the vehicles.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

Expanded description of key BM features:

- Organisational and operational context

The organisational scheme of this BM is to use public sector funding to purchase a pool of variable-sized accessible vehicles for the local community to use on an asset sharing basis. This could be implemented in areas where there is low demand and it is not commercially viable for private sector providers to adapt vehicles to meet equality legislation. The variable-sized accessible vehicles could range in size from 8 seaters (the preferred choice for some of the pool of accessible vehicles as they do not require special license to drive) up to 16 seat minibuses.

Due to 'state aid' rules[7], where public-sector grant funding is used for vehicle purchase, then those vehicles can only be used to operate non-commercial services and where there is no other competition in the area to provide the service to target users. This restricts their use by private sector providers and limits their use to community sector, charities and social enterprise organisations. A local organisation such as a community transport group or another NFP organisation is required to host the accessible vehicle 'pool' and manage hiring by local organisations.

- Vulnerable users and Prioritised areas

This business model opens up the opportunity for not-for-profit organisations such as community transport groups, charities and social enterprise companies to utilise accessible vehicles as and when they need them for their clients. E.g. the use of smaller accessible vehicles by volunteers for one-off trips where volunteer car schemes require an accessible vehicle to meet needs of physically disabled persons who cannot use a standard private car; or the use of larger accessible vehicles for social service client group travel such as lunch clubs. The vehicles would also be suitable for meeting many health and education sector client travel needs.

Challenges and opportunities:

Actor	Challenges	Opportunities
Public Authorities	Study the potential demand for this service to purchase or lease an adequate fleet of vehicles	Providing alternative collective transport to fill the mobility gaps created by the limited conventional PT services.
Local Community (community transport groups, charities and social enterprise companies)	For larger vehicles (>8 seats), drivers need a minibus license. This may present a barrier for volunteer drivers. Should ensure some smaller vehicles (<9 seats) are included in the vehicle pool. Establish an operation scheme that coordinates all the	To use vehicles from a public 'pool' to be able to run the service with low costs. Allows use of accessible vehicles by volunteer drivers when private car is not suitable due to access needs or group size.

---

[7] https://www.gov.uk/guidance/state-aid
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/582049/state-aid-self-assessment.pdf

	organisations that want to use the vehicles	
Other public-sector partners (e.g. health, social, education)	Requirements and likely demands to be discussed at the planning stages of the services. This can lead to availability limitations since the vehicles can be in-use by other partners at the times needed.	Availability of shared fully accessible vehicles that can be used by other public sector partners for transporting their clients as and when needed. Opportunity to outsource door-to-door accessible transport services to meet their clients' needs at lower cost and without the need to maintain a vehicle. Acquisition cost split into different public sector partners that allows a larger and more diverse fleet of vehicles.
Users	Adaptation to new forms of using the service Safety issues linked with the use of volunteer drivers	Lower cost for door-to-door accessible transport services More availability of transport for those requiring accessible vehicles.

Link and synergies with other Business Scenarios:

- BC5_S2: Not-for-profit collective transport services that better meet vulnerable user demands in rural areas

The link with this Business Scenario is the importance for reducing social exclusion in rural areas by providing further mobility opportunities and consequently improving access to and from sparse and remote villages. Both scenarios consider the use of a public 'pool' of accessible vehicles, creating a significant synergy. Depending on the nature of the situation, one scenario is more adequate to meet the vulnerable users' demands. Hence, studying the demand of both scenarios is essential to create a network of services that do not overlap, but instead complement each other. The participation of volunteers is determinant for having an in-depth understanding of rural population and for reducing the operational costs but vetting and training should be ensured to avoid safety issues.

- BC1_S1: All public transport bus services to be fully accessible

BC1S1 is a linked scenario to this one since "All public transport bus services to be fully accessible" is about removing accessibility barriers that prevent vulnerable users from utilising conventional Public Transport services by ensuring these operate with fully accessible vehicles. In rural areas, the asset sharing of accessible buses facilitates this goal especially where limited PT service contracts exist.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

Social and Demographic Barriers:

Target users	Social Factors	Significant barriers
Users in wheelchairs (disabled)	Lack of trust/confidence	Users in wheelchairs and with mobility impairments can find it daunting to use PT services, with uncertainty around accessible vehicle availability for the entirety of their journey.
Users with mobility impairments (elderly, disabled)	Fear of personal insecurity Attitudes and cultural acceptance Lack of social interaction	The complex needs and capabilities of these users may be sometimes hard to understand by other users, which creates a barrier when using collective transport services, since the target users may feel insecure.
	Willingness to change habits Aversion to uncertainty Willingness to share	Users that typically travel by private door-to-door transport services may find a barrier when planning to switch to travelling by bus and dealing with the related uncertainty.
Other users	Willingness to change habits	

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

5.5 Business Concept 4 (BC4) - Expand Ride-Sharing

Ride sharing options allow aggregation of the mobility demand for sharing a ride in the same vehicle. This can be done through:

1. public-private partnership ridesharing services using shared taxis with professional drivers;
2. peer-to-peer ridesharing services such as carpooling (where private individuals share the journey they are already making in their own car with other people going in the same direction at the same time) or volunteer lift giving schemes (where drivers, usually with their own vehicle, offer lifts to certain users for free or for a small reimbursement).

These types of solution can increase coverage for non-essential trips at a low cost and also increase integration into the core transport network.

5.5.1 Example Business Model solution for BC4_Scenario 1: Public-private partnership ridesharing services using shared taxis

This BM scenario involves establishing public-private partnerships with ridesharing providers able to secure services offering first and last mile connections at affordable fares to support integration with the mainline public transport network.

This particular Business Model has been designed based on the expertise of Verkehrsverbund Rhein-Sieg (VRS) transport association. VRS is the public transport association covering the area of Cologne/Bonn Region and North Rhine-Westphalia. VRS is responsible for ticket standardisation and pricing (VRS tariff), timetable coordination and joining information and services provided by the transport companies in the VRS network.

Based on the VRS expertise related to 'joining information and services provided by the transport companies in the VRS network', the following BM has been developed addressing public-private partnership ridesharing services using shared taxis.

The mobility gaps and needs addressed by VRS within the INCLUSION pilot are linked with offering cheaper prices for public transport services, better connections to public transport in the new development area of Hennef Im Siegbogen, located in the eastern part of Hennef, Rhein Sieg district. The target vulnerable users are families with young children, childless singles and families as well as seniors living or moving around this area.

BC4_S1: Public-private partnership ridesharing services using shared taxis

BM Canvas Table

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

1- Market & Customer Segments

Multi-sided platforms: This BM serves two interdependent Customer Segments. On one hand, the users that have difficulty in reaching PT stops due to mobility impairments, long distances to stops, safety concerns - i.e. those who would benefit from a door-to-stop connection forms one customer segment. On the other hand, citizens in areas with poor public transport coverage and complex trip requirements and who require a professional door-to-door service and would benefit from direct transport service but can't afford standard taxi.

User needs:

- There is a need for vulnerable users to have more **convenient** and **affordable** transport services when the PT options are too complex.
- The need for a more empathetic transport network for users that do not have access to expensive private services. Besides, women feeling uncomfortable with current services have the need for a more gender equitable environment.

2- Vulnerable Users & Prioritised Areas

Families with (young) children.

Children who aren't able to do their daily mobility by their own and need help, for example because of many PT connections or long distances to their destinations; peri-urban areas where distances to PT stops are too far to walk for many residents.

Females using late night/early morning services in deprived urban areas.

3- Social Demographic Barriers

Rural areas where first and last mile length for connecting journeys have high costs and there is a limited supply of private sector providers, the implementation of this service is less suitable.
Partnership agreements with private sector could stipulate the need for female drivers on certain services.
Subsidiaries are needed.

4- Value proposition

Affordable connections to PT network for users.

Source of additional and stable revenue for taxi providers

Additional passengers for PT services and taxis.

Lower cost PT solution in low density areas.

Reduce CO2 emissions due to a total reduction in the kilometres travelled by reducing parallel routes.

5- Mobility Gaps Addressed

Improvement of network density and frequency by offering first-last mile connection through ridesharing local taxi service.

6- Communication & engagement

Communication between different public departments.

Communication to the private partners.

Real time information on connecting PT services integrated with shared mobility booking technology.

9- Key Resources

Local taxi fleets who can combine their offers with other services.
Organisation platform combining the services and the booking.

10- Key Activities

Link information from first-last mile connection services with conventional PT journey planners.
Combining services like delivery service for medicine, pick-up service for school kids, and PT (perhaps delivering also postal services)

11- Key Partners

- Taxi fleets who can combine their offers with other services
- Public entities
- Ride sharing transport providers
- Public transport journey planners

7- Organisational & Operational context

In peri-urban areas different (half) public services are co-existing. This means delivery service for medicine, postal delivery services, PT, transport of pupils in special schools, taxi services…the idea is to combine these services in one central service platform and use the cars in an effective way.
Public/private partnerships where the public sector ensures that the private sector delivers non-commercial service enhancements that enable extension to a wider range of vulnerable groups at affordable prices.
In cases where no competition exists and demand for the service is not commercially viable as a standalone service, partnerships with selected private sector enterprises can dramatically reduce cost of operation.
For example, partnership payments to private sector taxi companies can be designed to secure services offering first and last mile connections to support integration with the mainline public transport network.

12- Cost Structure

Platform maintenance
Operational costs
Subsidies

8- Revenue Streams

Revenues from fares supplemented by public sector partnership payments. The private provider such as a taxi company can plan for reliable income in addition to the "normal" business.

15- Social Innovation

Different public services available in one single platform

13- Inclusion Principles/Goals

Convenient, gender equitable, affordable, empathetic

14- Technology

Booking and organisation platform; online connection to drivers; cars/bus need special equipment.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

Expanded description of key BM features:

- Vulnerable Users & Prioritised Areas

In deprived urban and peri-urban areas, where it is often too far to walk to public transport stops or where there are perceived safety issues walking or waiting in certain areas or at certain times of day, first-last mile connections using ridesharing taxis is a valuable service for certain vulnerable users.

- Cost structure and revenue streams

Under the umbrella of partnership subsidies, ridesharing taxi services for first-last mile connections will manage to offer affordable prices (similar to PT) to ensure inclusivity of vulnerable users. The objective is not to create competition with regular taxis but rather offer them an additional revenue source. This partnership arrangement can be used to ensure that private sector providers tailor their services for vulnerable user groups or to extend commercial services into non-commercially viable prioritised areas in the most cost-effective manner. Ridesharing taxi services are also able to offer combined delivery packages such as service for medicine, pick-up service for school children, and PT (perhaps delivering also postal services).

Challenges and opportunities:

Actor	Challenges	Opportunities
Public Authorities	Negotiate with ridesharing taxi service providers that operate on a commercial basis and select the ones that meet the most vulnerable users' needs. Issues around state aid funding where services could be commercially viable.	Complement the PT network by providing adequate first and last mile options using ridesharing taxi services. Using taxi companies in the local areas would reduce the investment needs away from new fleets and limit it to the booking and integration systems. Services delivered through partnership are often planned with public bodies in other sectors such as health, education or employment, with cross-sector funding made available to target the priorities of these sectors and/or address shortcomings in providing access to services provided by these sectors. E.g. subsidised shared taxi services to hospitals or to out of town employment sites from deprived urban areas.
Ridesharing taxi service providers	Change the operation scheme from commercial door-to-door services to public-private partnerships to deliver first and last mile connection services.	Increase viability and market segment for the local taxi providers.

Users	Adaptation to new forms of PT service connections.	Ability to reach more destinations using PT services instead of expensive door-to-door transport services.

Link and synergies with other Business Scenarios:

- BC6_S1: New forms of subsidised travel through MaaS systems

The link with this Business Scenario is the new ways of subsidised travel options available in a MaaS platform to allow vulnerable users to choose freely the transport service that best meets their needs anywhere and at any time. These subsidies will enable booking of first-last mile connections to PT through ridesharing taxi services available in the MaaS platform.

Social and Demographic Barriers:

Target users	Social Factors	Significant barriers
Users who live in remote areas and who do not own a car	Willingness to change habits	Users who tend to travel by conventional PT services may find the idea of using taxis to reach remote destinations unnecessary and expensive.
	Ability to pay	In rural areas, first and last mile connections may still be a long distance and using taxis, even on a shared basis, could be expensive.
	Willingness to share	Users who tend to travel by taxi may find the idea of using ridesharing services to reach remote destinations uncomfortable and unsafe.
Females using late night/early morning services	Willingness to share Fear of personal insecurity	

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

5.5.2 Example Business Model solution for BC4_Scenario 2: Peer-to-peer ridesharing services

In rural areas, peer-to-peer volunteer lift giving services where individuals use their own private vehicle have the potential to fill some of the gaps in the public transport network, delivering non-essential transport for social, shopping and leisure purposes without public sector funding. This expands the range of transport services available for non-essential travel. These services can be small in scale, with only a few volunteers requiring little coordination and management, up to large scale schemes, with hundreds of volunteers that require substantial time input in management and coordination or rides and in attracting and retaining volunteers. Usually, larger scale schemes are managed by community transport groups using a paid manager supported by volunteer staff.

Within the INCLUSION project the Flanders Pilot Lab involved providing enhancements to an established ridesharing service. The Flanders area of Belgium provides a mixture of urban, peri-urban and rural geographies, but public transport does not offer any door-to-door solution creating difficulties for many older persons to access the network. To overcome this gap in provision, TAXISTOP, a social enterprise company (and INCLUSION project partner), offers a door-to-door ridesharing service for 35,000 elderly persons in Flanders through their Less Mobile Stations (LMS) provision using volunteer drivers. In 80% of the Flemish municipalities, there is a partnership between the municipality and Taxistop to organise this service. Taxistop offers training, insurance and software, whilst the municipalities conduct the recruitment and acceptance of members and volunteers, and the local dispatching. The journeys are offered using 2,500 voluntary drivers in their private cars. Around 400,000 rides are provided per year. The business model that follows is developed by TAXISTOP based on their knowledge and experience delivering the LMS services.

BC4_S2: Peer-to-peer ridesharing services

BM Canvas Table

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

1- Market & Customer Segments

Segmented customers: Peer-to-peer ridesharing services are targeted to serve users that have slightly different needs and capabilities, sharing the fact that they cannot use conventional public transport services, either because they are not door to door or because they simply do not exist!

Users:

- Target users for this service need door-to-door services in order to travel to certain destinations.
- Transport services for vulnerable users need to be **affordable** and **convenient** compared to expensive private door-to-door transport services.
- The lack of public transport options creates the need for more community-led **empathetic** and **empowering** transport schemes.

2- Vulnerable Users & Prioritised Areas

Different categories of vulnerable user (rural dwellers, elderly, physically disabled, sensory disabled, low income, people without car license, women) in rural and peri-urban areas with limited conventional PT service provision and lack of commercial service providers.

3- Social Demographic Barriers

- Women using the service to be able to choose women drivers.

- Peer-to-peer services often exclude physically disabled and those requiring an accessible vehicle (volunteers may not feel comfortable transporting users with additional needs that they are not familiar with or do not understand).

- Social exclusion

4- Value proposition

Users get affordable transport in places where no alternative exists and companionship

Volunteers get feelings of satisfaction, pride and identity

Freedom to go to a certain activity or to visit family and friends

5- Mobility Gaps Addressed

Plugs gaps in public transport for those without access to own car. Not suited for essential trips as services cannot be guaranteed.

6- Communication & engagement

Promote the service among places with people in need of this service (nursing homes, hospitals, local communities etc.), as well as local businesses.

Encourage volunteer participation by organising social events

9- Key Resources

Volunteers

Management and coordination team for large volunteer schemes

10- Key Activities

Awareness training on vulnerable users' needs for volunteer drivers

Trained volunteers to have access to a pool of accessible vehicles

Community driven activities

11- Key Partners

Community organisations

Local charity

Social enterprise company

Volunteer staff

7- Organisational & Operational context

Volunteer schemes run by the community sector with role in management, coordination and attracting & retaining volunteers. Public sector grant funding to be provided to community sector to provide volunteer training and to meet management costs. Larger schemes coordinated by social enterprise companies with paid staff.

These services are most useful for non-essential transport such as social, shopping and leisure purposes in rural and peri-urban areas.

12- Cost Structure

Management and marketing
Volunteer driver scheme payments to drivers to cover petrol and wear and tear.
Staff time to recruit volunteers

8- Revenue Streams

Volunteer driver ridesharing: Revenues from users' payments. Users typically pay a low reimbursement per km to drivers to use these services. Contributions to volunteer drivers is limited by legislation to ensure that private car insurance policies remain valid.
If shortfall in operating costs, this can be funded (or part funded) through public sector grants, if there is no competition
Sponsorship or donations from local businesses.

15- Social Innovation

Providing an affordable option for non-essential trips to all vulnerable users | Use of volunteers on such schemes | Boosting the community feeling between elderly people and volunteers

13- Inclusion Principles/Goals

Accessibility, Affordability, Empowerment, Empathy, Convenience

14- Technology

Technology to match those offering lifts to those seeking lifts

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

Expanded description of key BM features:

- Technology to match offering lifts to those seeking lifts

Peer-to-peer ridesharing services are very suitable to be offered through a Mobile App in order to match lifts with users seeking them. In this way lift matching can be carried out in real time. While technology-based booking can significantly reduce the staff resources and costs associated with managing the service, and is popular with younger users, it may also create a barrier to use of the service for some vulnerable users not able to use or not comfortable with using smart phone apps. As a result, especially for volunteer car services, manual telephone booking and matching is retained for those that require it.

In the case of volunteers, it can be noted that their availability should be taken into account when offering lifts and consequently to match them with vulnerable users seeking a lift. Mobile app booking technologies that add gamification features that reward and incentivise volunteering could help recruit more volunteers and keep the ones that participate motivated with the service. Incentives can also be used to reward volunteering when demand for trips is highest or to provide trips that have higher social value (e.g. hospital trips).

- Social innovation

These schemes are a good example of social innovation, since they provide a solution for non-essential trips to a wide range of vulnerable users who need it. Concretely, the use of volunteers in these kinds of services boosts the community feeling between vulnerable persons and volunteers, which helps reduce social exclusion.

Challenges and opportunities:

Actor	Challenges	Opportunities
Community transport organisations	Management and coordination of rides. Attracting, retaining and coordinating volunteers, ensuring rigorous vetting and training.	To provide a door-to-door transport service that meet vulnerable users' demands and are affordable for them.
Volunteers	Being empathetic and understanding of vulnerable users' needs and capabilities. Ensuring safety and trust when providing ridesharing services. Lack of accessible vehicles that some vulnerable users need. Encouraging volunteers to widen the range of users they are willing to help.	Ensuring inclusive mobility for all. Allow volunteer drivers access to shared accessible vehicle pool (BC3_S2) Strengthened social cohesion Incentives can be used to encourage volunteers to agree to transport different types of users or at times of day most demanded.
Users	Reliability (availability when needed) of services using volunteers.	Ability to reach more destinations using ridesharing services instead of expensive door-to-door transport services. Social companionship with volunteers

Link and synergies with other Business Scenarios:

- BC5_S2: Not-for-profit collective transport services that better meet vulnerable user demands in rural areas

Not-for-profit collective transport services that better meet vulnerable user demands are very convenient to fill the gaps met by the limited PT coverage in rural areas. These collective transport services cover routes that are necessary for a large number of users but where the PT network does not reach, whereas peer-to-peer ridesharing services provide an individualised service to complement the rest of the services.

- BC3_S2: Asset sharing of buses where the users of the asset are organisations providing a service for members of the public

Similarly, asset sharing of buses where the users of the asset are organisations providing a service for members of the public is very convenient when there is limited conventional PT service provision and community organisations use buses from a 'pool' of high specification vehicles when they need it for their clients. Again, when user demands and needs are very specific, volunteer drivers may request access to the shared vehicle pool for ride-sharing trips that require use of an accessible vehicle. Suitable driving licenses need to be held by the volunteer drivers and vehicle insurance including use by volunteer drivers is required.

Social and Demographic Barriers:

Target users	Social Factors	Significant barriers
Users who live in remote areas and do not own a car	Willingness to change habits	Users who tend to travel by conventional PT services may not be interested in the idea of using peer-to-peer ridesharing services to reach remote destinations because of the requirement to fit with the availability of the driver. Travelling by PT services usually has a formal schedule.
	Aversion to uncertainty Fear of personal insecurity	Travellers may not trust the reliability of this service if the driver is not professional. For the same reason, they may not feel safe when using the service.
	Willingness to share	Users who tend to travel by taxi may find the idea of using peer-to-peer ridesharing services to reach remote destinations uncomfortable and unsafe.
Females using late night/early morning services	Willingness to share Fear of personal insecurity	

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

5.6 Business Concept 5 (BC5) – Encourage new collective transport services

New collective transport services are services scheduled to pick up and drop off people in accordance with the actual needs of the passengers based on demand. They need to be booked in advance of travel either through telephone booking or using mobile app technology. Software algorithms aggregate bookings to generate a schedule of pick-ups and drop-offs either door-to-door or at designated locations. The services can better accommodate needs of some vulnerable users by offering door-to-door pick-up and drop-off or by providing niche services where timings and routes are tailored to the demands of certain vulnerable user groups. They can be considered as flexible services that span the wide space between taxis and conventional public transport.

Two distinct scenarios can be developed related to this business concept:

1. Commercially viable collective transport services
2. Not-for-profit collective transport in rural areas

5.6.1 Example Business Model solution for BC5_Scenario 1: Commercially viable collective transport services that better meet vulnerable user demands

New collective transport services can be offered by private sector providers in urban areas as commercial services where demand is high – mainly serving commuter demand. There are other commercially viable examples of these services operating to serve a specific niche market where demand is high and/or where high fares can be charged (e.g. airport shuttle services). Few of these commercially viable urban examples have been developed with vulnerable users in mind. However, it is even more rare to find commercially viable collective transport services in peri-urban and rural areas for vulnerable users. An approach for increasing the demand for new collective services from vulnerable users is to better identify where the demand exists and to design the new collective service according to this. This maximises passenger numbers and hence revenue generation.

This particular Business Model has been designed based on BusUp's expertise and experience within the INCLUSION Piot Lab for Barcelona. BusUp is a private on-demand service provider. Within the Inclusion project, BusUp developed commercial collective transport services from peri-urban and rural areas to a large music festival Canet Rock (http://canetrock.cat/) located in the village of Canet de Mar, 45km north from Barcelona. The event attracts more than 20,000 attendees every year. Public transport is essentially limited from the peri-urban areas or non-existent from most rural areas, so the car is perceived as being the only option, despite private car use being more expensive.

Utilising predicted demand for the event derived from Social Media data analysis (see business model for BC2_S2) collective bus service routes were designed that could be commercially viable at affordable prices for the festival attendees (particularly young people and females). BusUp service's added value is to provide a faster and easier transport alternative, compared to other public transport alternatives, and a cheaper, safer and more sustainable alternative than car to attend the event.

BC5_S1: Commercially viable collective transport services that better meet vulnerable user demands

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

1- Market & Customer Segments

Multi-sided market: The users identified for this BM share the need to use transport services to attend an event, but where location of specific user demand is uncertain and dispersed. Tailored collective bus services offer a means of serving this demand in a viable way. Digital data analysis techniques to estimate user demand is crucial for this to be feasible. This analysis can have a focus on or give more weight to vulnerable users. On the other hand, it also needs bus/coach providers to contract the work to.

User needs:

- Users with poor PT connection to attend events and with no car option have the need for more **convenient** and **empowering** transport options.
- Women that feel uncomfortable by travelling in other transport modes that may make them feel unsafe or that are not driven by professional drivers have the need for more gender equitable options.

2- Vulnerable Users & Prioritised Areas

Vulnerable users:

- Vulnerable users that are looking for safer and more convenient collective transport options and are prepared to pay premium fares (women travelling at night)
- Vulnerable users that are willing to travel to common destinations with affordable prices (young people accessing concerts/large events)
- Users with disabilities (cognitive and sensory)

Prioritised areas:

In peri-urban areas (where there is more potential demand, but it is not sufficiently concentrated or regular to justify fixed route services).

3- Social Demographic Barriers

Rural areas are less able to be commercially viable for private operator services.

4- Value proposition

Direct on-demand bus routes to leisure and/or cultural events and attractions.

Added value:

Save time (versus PT) and costs (versus car) and have access to a safer and more sustainable mode of transport

5- Mobility Gaps Addressed

- Limited access to PT
- Direct routes to the event
- Official and safe mode of transport

Affordable

6- Communication & engagement

Communication:

Personal assistance for vulnerable users that have specific needs

Communities and organisations that engage with the vulnerable user groups and can promote the service

Event organisers to raise awareness and promote the bus service amongst potential attendees

Attraction managers to promote the bus service

Channels:

Mobile Apps
Websites
Social Networks

9- Key Resources

- Technical: Booking platform &
- Demand Aggregation Algorithms
- Physical: Fleet Availability
- Human: Drivers

10- Key Activities

- Communication
- Customer Care
- Operations

11- Key Partners

- Client (event organiser)
- Bus operator
- Tech company

7- Organisational & Operational context

Digital data mining (from social media activity or mobile phones activity) can highlight pockets of demand from certain user groups to access particular locations. This is used to establish collective bus service routes that suggest there is sufficient demand to be commercially viable. Private sector providers offer new on-demand collective bus services on these routes.

Bookings are made online via bus company web-site or app.

Routes are only confirmed, when booking reach a minimum of 70% of bus capacity.

12- Cost Structure

Between 60-80% of the costs are subcontracting of bus operators
Marketing
Technology development

8- Revenue Streams

Ticket sales to passengers

15- Social Innovation

Better transport organisation, more efficient service provision, more tailored end-user services

13- Inclusion Principles/Goals

Convenient, Empowering, Gender equality

14- Technology

Identification of potential demand of the service through social media and data mining

Expanded description of key BM features:

- Vulnerable users and prioritised areas

Commercially viable collective bus services require the identification of a specific niche market where demand is high and/or where high fares can be charged. Using digital data mining of information mined from Social Networks or mobile phone data can provide better comprehension of unserved high demand situations or to identify specific vulnerable groups that are likely to be willing to pay a premium price for a tailored service for certain trips. These could be young people travelling from rural and peri-urban areas to large scale events, females looking for women only door-to-door bus services late at night, or migrant workers from deprived urban areas accessing employment sites outside the city.

Three characteristics of this type of service that are important factors in contributing to its successful application:

1. Gaps in knowledge of demand due to irregular or rapidly changing demand
2. Social Media active target groups
3. Shortage of suitable existing transport options for the target groups

Note that in the Barcelona pilot lab example the demographic profile of the collective bus users was 84% women and 78% were under 24 years of age. A large proportion of this young demographic of the target users are social media active and the use of mobile or on-line technology posed few barriers in booking the bus service.

- Cost structure and revenue streams

For the Barcelona pilot lab example, between 60-80% of the costs are related to subcontracting the bus operators. These service contracts are confirmed only if they reach a minimum 70% of capacity (of the bus size selected); if this is not the case, the route will be cancelled between 8 and 15 days prior to the festival. This policy reduces the financial risk to the bus operator. Another cost is the marketing to reach these vulnerable users and raise their awareness that BusUp services exists; the marketing strategy is focused on social networks and promoting the bus service through the event organizer media channels. Finally, the last cost is related to technology development, in this case (link with BC2S2), to identify potential demand through social media analysis. Regarding the revenue streams, the only incomes are the users' ticket sales. The ticket prices for passengers vary depending on the driving time and distance with the BusUp services on average costing passengers 0.17€/km, compared to an average cost by car of 0.35 €/km. So, unless sharing lifts, the cost of travelling by car is around double that of using the BusUp bus service.

Challenges and opportunities:

Actor	Challenges	Opportunities
On-demand PT Operator	Provide commercially viable services where there is low demand, or the total demand is partially unknown.	Provide services that meet vulnerable users' needs that can be identified using social media or mobile phone data analysis technology.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

	Expand the market segment on the service by offering the service for different events.	Promote more sustainable transport services for attending events
Technology providers	Need for understanding mobility problems and trends in order to have a bigger impact in the model development. Digitalise all the processes involved in the service	Enlarge the market segment of social media data analysis techniques by their application in transportation studies. Routes optimisation based on confirmed bus stops.
Event organisers	Give enough information about all the different transport modes to attend the event and emphasise the most sustainable ones.	Provide accessible transport services to vulnerable users that otherwise would not have an option to attend the event.
Users	Switch from traditional transportation modes to others that are more innovative and sustainable. Uncertainty if booked trip is cancelled due to insufficient passengers	Affordable and reliable transport option to attend an event that otherwise would be difficult to reach. Safer travel option tailored to vulnerable user needs

Link and synergies with other Business Scenarios:

- BC2_S2: Big data analysis to better identify where demand for transport services exists

Using social media data to identify unmet needs and demands of people that want to attend to the music festival would capture the interest to predict potential demand and offer the most appropriate bus stops for BusUp service. This measure would increase the bus occupancy rate, the number of direct routes to the festival and the number of tickets sold.

Social and Demographic Barriers:

Target users	Social Factors	Significant barriers
Users who live in remote areas without a good PT connection Users who do not own a car	Willingness to change habits Willingness to share Aversion to uncertainty	Users travelling to common destinations who usually travel by conventional PT services or using a private vehicle may be reluctant to travel by a collective service which is dependent on sufficient demand to operate.
	Lack of trust / confidence	The risk of bus route cancellation at short notice may deter some potential users.
	Lack of social networks	People who are not active on social media might not be aware of the existence of these services and the marketing promotions.

5.6.2 Example Business Model solution for BC5_Scenario 2: Not-for-profit collective transport services that better meet vulnerable user demands in rural areas

The majority of collective services provided in peri-urban or rural areas are to replace poorly used conventional public transport services, or to provide a service where no other public transport exists. Commonly these collective services form a disjointed array of demand responsive bus services. These are sometimes provided under service contract by private sector providers but are more often provided at lower cost by not-for-profit community sector providers and driven by volunteers to serve specific purposes where a gap in the conventional network is evident. As a result, they are often not designed with vulnerable users' needs in mind, do not operate with accessible vehicles and very often are restricted to particular trip purpose, time of day or destination. Vehicles can vary in size according to the demand being served but typically are small minibuses or large people carriers. To better meet the needs of more vulnerable users in rural and peri-urban areas, it is recommended that these collective transport services are made open to all and operate using accessible vehicles.

This Business Model has been developed based on four examples featured in the WP3 case study review work. These are listed in the table below.

INCLUSION examples	Comment	User Types	Area Types
4.2 De Bij Bus	Community bus; Volunteer driver; 8 Seats; 88% (funding from private sponsors, donations and member fees (remainder is grant funding which covers vehicle depreciation)	Elderly; Disabled; Rural; Young persons with mild cognitive impairment	Peri-urban
4.1 Bürgerbuses in NR	Community bus; Volunteer driver; 8 Seats Grant funded	Elderly; Disabled; Rural	Rural Peri-urban
4.8 Wensbus ("Wish bus") Limburg	Volunteer car or minibus (8 seat) service using mix of volunteer cars or community owned vehicles; Grant funding + user fares supports operations; Grant funding also available for vehicle purchase; Replaces service contract routes	Elderly; People without driver's license	Rural
5.6 Haltetaxi Zeeland	Grant funded feeder ridesharing service using minibus operated by taxi association; Pickups from bus stops; Bus fare for users; Assistance cards carried by users; Replaces withdrawn service contract routes	All	Peri-urban

inclusion

BC5_BS2: Not-for-profit collective transport services that better meet vulnerable user demands in rural areas

BM Canvas Table

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

1- Market & Customer Segments

Segmented customers: Not-for-profit collective transport services in rural areas address the transport needs of a range of different target user groups.

The participation of volunteers is beneficial for 1) having an in-depth understanding of the actual needs of rural population and 2) reducing the operational costs

User needs:

- Customers addressed in this BM have the need for an **affordable** and **convenient** transport option that allows them to avoid the use of expensive door-to-door transport services.
- The mobility gap created by conventional PT services in rural areas for vulnerable users shows the need for more **accessible** and **empowering** transport schemes.

-

2- Vulnerable Users & Prioritised Areas

The service can primarily address the needs of people at risk of isolation and social exclusion in remote and rural areas.

Target user groups can be expanded to include people in rural areas without a car and vulnerable users such as the elderly or people with reduced mobility who find it difficult to walk to bus stops.

3- Social Demographic Barriers

Especially for services grouping different rural areas/counties, it is important (but not always easy) to have a number of voluntary sector representatives from each area. This aspect is important as each volunteer can highlight the specific mobility and social needs of target rural people.

4- Value proposition

Reduction of social exclusion in rural areas by providing further mobility opportunities and consequently improving access to and from sparse and remote villages.

Fill the gap in service provision which usually comprises few transport services operated based on the resources available.

Low cost door-to-door option for less mobile persons

5- Mobility Gaps Addressed

Mobility needs of people living in rural and remote areas where the mobility choices/options are limited and/or there is low provision of public transport services

6- Communication & engagement

Vulnerable users can be made aware about the service via the development of focus groups and local promotional campaign.

The competent authority, such as transport agency or county council, has to set up an open dialogue among stakeholders in order to avoid competition or confrontation between the non-profit organisation and the local bus operators and at the same time for improving the integrations between different services.

Communication with the local 'Champions' or ambassadors and local politicians, for raising awareness about the service and getting national and local government to give higher priority and support.

9- Key Resources

Driver trainers. Selected drivers. Local Ambassadors for the recruitment of the drivers and the promotion of the service. Staff of Transport Operator working on Service Control for service planning, integration and monitoring

10- Key Activities

Service planning (co-creation design with target segment can help). Definition of service level agreement and performance indicators. Set of monitoring procedures. Service promotion

11- Key Partners

Public sector for the provision of part of the resources.

Local Communities and working group for getting national and local government to give higher priority and support to developing rural mobility services.

7- Organisational & Operational context

The services have to be carried out by organisation with a license supplied by the national regulation. Then, the service could be operated under the umbrella of a Transport Company of which the community organizations should act as "sub-contractor". A call centre has to be provided for registration and booking. Services can be operated with mini-bus fully accessible vehicles, and drivers can be trained for helping passengers drop on/off operations. To the extent possible, services are scheduled to connect with other scheduled bus routes.

12- Cost Structure

Major costs are due to the purchase of the vehicles and the costs for the operation of the service (mainly cost of the drivers where paid drivers are used, fuel and maintenance). Other costs are due to the purchase and/or maintenance of the ITS software (if implemented).

8- Revenue Streams

Passenger fare revenues

Public financial support (State level, transport sector and Health sector)

Local contributions (advertainments, sponsorships)

15- Social Innovation

Not-for-profit organisation with local voluntary-sector board, deeply-rooted in the local community.

13- Inclusion Principles/Goals

Affordable, accessible, empowering, convenient

14- Technology

ITS software for booking, trip management and service optimisation. An app can be used for communicating information from the centre to the drivers.

Expanded description of key BM features:

- Communication and engagement

Not-for-profit collective transport services are aimed to fill the gaps created by poor conventional PT transport in rural and peri-urban areas. For instance, it can be anticipated that this service will cover some demand otherwise met by volunteer or peer-to-peer car service or other flexible PT services. Therefore, the competent authority, such as a transport agency or county council, needs to take into account all the stakeholders that could possibly provide these services in any way, in order to avoid competition or confrontation between the non-for-profit organisations and the local bus operators.

Raising awareness about this service in a clear manner is essential for the correct understanding of the functioning of this service and the proper communication among all connected transport services that in the end work to complement each other and create a fully accessible transport network that meets all vulnerable users' needs.

- Organisational and operational context

Although these services are sometimes provided under service contract by private sector providers, they are more often provided at a lower cost by not-for-profit community sector providers with a license provided by the national regulation. Fare revenues typically only cover a fraction of the operating costs in rural areas (usually less than 25%) when paid drivers are used and so public-sector funding is required for the shortfall. Public-community partnerships exist where the community organisation supplies the driver and operation of the service, and the public sector provides the vehicle, the funding for driver training, salary and running costs. Sponsorship from local businesses that may benefit from the existence of the new service can also provide a revenue stream.

For these services to be suitable for vulnerable users with mobility impairments or in wheelchairs accessible vehicles should be used; however, this incurs significant additional cost. Public sector grant funding is needed to purchase (or lease) these more expensive vehicles. Establishing a shared 'pool' of accessible vehicles in the community should be considered to ensure the public sector gets maximum use and value for money from its vehicle purchase (see BC3S2).

- Trip management and service optimisation

In order to provide a flexible and demand responsive collective service, it should be designed with updated ITS software for dynamic route optimization and with an adequate trip booking management. This being the case of a demand responsive collective service, the management and operation of the service should be designed accordingly and considering all the potential gaps in the service. Booking using mobile app technology has reduced the cost burden associated with this type of services and it should be considered with the implementation of the service; however, some vulnerable user groups (such as the elderly) may also require a staffed telephone booking service.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

Challenges and opportunities:

Actor	Challenges	Opportunities
Public Authorities	Study the potential demand for this service to purchase an adequate fleet of vehicles. Specify minimum operating times and areas covered by the service while keeping flexibility in terms of specific stops and pick-ups. Financing of accessible vehicle purchase.	Providing an alternative collective transport to fill the mobility gaps created by the limited conventional PT services. Opportunity to save money by replacing inflexible and infrequent fixed route bus services with low passenger numbers with services that better meet user demands. Flexible transport service that better meets vulnerable users' needs (e.g., door to door) and increase PT service scope. Provides connections to conventional PT network.
Community sector transport providers	Adaptations to deliver flexible collective services that do not follow traditional PT schemes (e.g. flexible specific stops and pick-ups) Attracting volunteer drivers. Paid drivers can improve reliability and stability of the service but incurs significant cost.	Providing a service that better meets and adapts to vulnerable users' demands. Local champions for the service are well placed to raise awareness and promote it to difficult to reach groups in the community.
Other public-sector partners (e.g. health, social, education)	Reallocation of client transport budgets to help finance the collective transport service.	Opportunity to provide door-to-door accessible transport services to meet clients' needs, removing need for separate expensive dedicated client transport often using taxis.
Users	Adaptation to new forms of flexible collective transport services (e.g. booking, flexible stops etc.).	Reduction in the need for car ownership by having this accessible, affordable and flexible option. Greater independence and freedom for vulnerable and isolated citizens.

Link and synergies with other Business Scenarios:

- BC3_S2: Asset sharing of buses where the users of the asset are organisations providing a service for members of the public

The synergy with this Business Concept is obvious since one requires the use of an accessible vehicle while the other establishes a shared 'pool' of accessible vehicles for use within the community. As public sector finance is required for the purchase of the accessible vehicles in both cases it is practical for vehicles to be supplied to a shared 'pool' so that they can be used by other organisations in the community (community transport groups, charities and social enterprise companies as well as public sector partner use for their clients) when not in use on the collective transport service.

- BC7_S1: Providing staff awareness training to increase confidence and safety in using public transport services

As mentioned in the Business Concept description, the public sector should provide the funding for driver training in addition to the vehicles. This training is linked directly with non-for-profit collective transport services for vulnerable users to be confident that their needs are fully understood and hence to ensure the safety, functionality and reliability of the service.

Social and Demographic Barriers:

Target users	Social Factors	Significant barriers
Users in wheelchairs (disabled) Users with mobility impairments (elderly, disabled)	Lack of trust/confidence Lack of empathy	Users in wheelchairs and with mobility impairments may find a lack of empathy from staff and cultural attitudes of other passengers a barrier to using public transport services.
	Fear of personal insecurity Lack of social interaction Attitudes and cultural acceptance	The complex needs and capabilities of these users may sometimes be hard to understand by other users. This creates a barrier when using collective transport services, since the target users may feel insecure.
Elderly Cognitive impairments	Ability to understand information Ability to communicate Ability to use technology	On-demand collective bus services do not operate to a fixed route or timetable and so information on their operation can be confusing, especially to elderly users. Use requires pre-booking which may present a barrier for some elderly or disabled persons.
	Willingness to change habits Attitudes and cultural acceptance Aversion to uncertainty	Users who typically travel by private door-to-door transport services may experience a barrier when planning to switch to travelling by bus and the related uncertainty.
Users at risk of isolation and social exclusion	Willingness to change habits	

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

5.7 Business Concept 6 (BC6) - Discount payments through MaaS

The current approach to reduce financial barriers for travel by vulnerable users is to offer free or discounted travel to eligible users in certain vulnerable user groups, and then provide the transport provider with reimbursement payments from the public sector to compensate them for reduced fare revenues. This approach has typically been delivered in urban areas through discount travel schemes for conventional bus and taxi use. This type of funding can be applied to both deregulated commercial services as well as in regulated environments where net cost contracts are awarded by the public-sector transport authority to the private sector transport provider. It may also be appropriate in regulated environments where gross cost service contracts are awarded by the transport authority to a private sector provider, but the discount travel scheme is funded by a different public-sector partner (e.g. social care who reimburse free travel for their clients). In such cases, reimbursement payments would be between the public-sector partners rather than to the private sector operator. However, a requirement for this approach to be effective and suitable is that the transport services are accessible, attractive and convenient for the vulnerable users.

The more limited numbers of accessible buses and taxis combined with the sparsity of the public transport network in peri-urban and rural areas has resulted in more limited choice of affordable travel options in these areas. Furthermore, discounted travel is not available to utilise the growing number of non-conventional transport services that are becoming more prevalent in urban, peri-urban and rural areas.

Alternative ways of funding discounts for vulnerable users are needed which allow the discounted travel to be extended to a wider range of services, allowing users choice on the services they can afford to use. This requires inclusion of new collective flexible services provided by both private sector and community organisations, asset sharing hire services and possibly also volunteer and peer-to-peer services to be included in discounted travel schemes. An approach for achieving this is through use of a MaaS-type system that offers a subscription payment model for use of all the transport options in an area. This has the potential to not only provide more affordable choices to vulnerable users, thus supporting more independent travel, but also motivate commercial mobility providers to cater for vulnerable users. The MaaS technology platform offers a mechanism by which other-sectors (from health, education, social care sectors) can provide funding for discounted travel by their vulnerable client groups.

5.7.1 Example Business Model solution for BC6_S1: New forms of subsidised travel through MaaS systems

The concept of a personal mobility budget provided through a MaaS App has been deployed in the INCLUSION Pilot Lab in Flanders, where the MaaS Olympus App has been developed for migrant job seekers with a small mobility budget included. Migrant job seekers often live in deprived urban areas but face many barriers accessing jobs including language, cost, and lack of knowledge about PT possibilities. The PL has investigated whether the Olympus App can offer a feasible solution when applying for a job with companies located in areas that are difficult to reach and the jobseeker has no car of his/her own. Based on the INCLUSION PL experiences, the following business model has been developed.

BC6_BS1: New forms of subsidised travel through MaaS systems

BM Canvas Table

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

1- Market & Customer Segments

Multi-sided platform: The implementation of subsidised travel through MaaS systems serves two interdependent Customer Segments. Concretely, this BM needs a large base of vulnerable users that receive their personalised mobility budget through this App and also a large base of transport services that will be available in the MaaS App.

User needs:

- Customers that receive public funding for travelling need a more **empowering** system that allows them to choose their transport services freely.
- There is also a need for **accessible** and **affordable** services to be at hand.

2- Vulnerable Users & Prioritised Areas

Any vulnerable person with a statutory entitlement to transport provision could be a candidate to receive personalised mobility budgets in place of a dedicated service: e.g. for certain trips for elderly, disabled, children.

Others may receive personal mobility budgets funded via employers: e.g. Job seekers, Migrants, Low-income users.

3- Social Demographic Barriers

Digitally excluded users not being confident or not being able to use these technologies.

Issues around affordability of services for those not eligible for travel budgets.

4- Value proposition

Vulnerable users are free to individually choose the transport service that best meets their needs anywhere and at any time. Each eligible user has a personalised mobility budget to spend in the MaaS platform.

Provides motivation for wider range of mobility providers to receive bookings for 'client' transport – increased competition

5- Mobility Gaps Addressed

Increased affordability and choice for eligible users.

Improvement of network accessible and connectivity and enhancement of intermodal options

6- Communication & engagement

Communication

Advertise the App around associations and entities that help vulnerable users to encourage them to use the App.

Engagement

Provide App tutorials and trainings for vulnerable users that have difficulties understanding this technology.

Incentive for transport providers to offer services which better cater for vulnerable user needs

9- Key Resources

MaaS system that integrates data on availability, timings, routes and cost of use for all transport services.

Individualised budget strategy

10- Key Activities

MaaS App development and API integration with all the transport services

11- Key Partners

Private sector tech companies
Transport service providers
Public sector entities
Employers

7- Organisational & Operational context

MaaS platform development could attract venture capital investment and be developed by private sector tech companies. Delivery could also be commercially viable with the private sector organisation receiving a cut of the monthly subscription payments. However, in areas where demand is not high enough (e.g. rural areas) it is likely that deployment would require additional investment from the public sector to develop the platform but also to ensure a choice of transport provision in the area since the MaaS concept requires all transport options be integrated in a single MaaS platform. → Public-private partnership funding and agreements.

The MaaS system provides a mechanism for other public-sector partners to subsidise transport for their clients to access services that meet their objectives (e.g. education authorities, employment agencies). Qualifying users are credited with their personalised mobility budget by their public-sector provider and can top up their budgets using their own income.

12- Cost Structure

MaaS Platform development and maintenance.
Additional investment in transport supply options in low density areas where commercial providers are absent.
Finance from public sector for personal mobility budgets.

8- Revenue Streams

Venture capital investment for platform development
Cut of the monthly subscription payments for use of MaaS platform
Public sector investment (for non-commercial scenarios)

15- Social Innovation

Technology inclusive for vulnerable users that gives them freedom of choice

13- Inclusion Principles/Goals

Empowerment, Accessibility, Affordability

14- Technology

MaaS platform technology

Expanded description of key BM features:

- Value proposition: 'Person centred' funding approach

Traditional discount schemes do not allow users to choose the transport option that best suits them, leading to unwillingness to use the transport or a feeling of obligation to use a particular transport mode. The subsidised travel through MaaS, granting a personal mobility budget to qualifying vulnerable users based on their personal circumstances, allows vulnerable users themselves to use, choose and pay for the services. Qualifying users are credited with their personalised mobility budget by their public-sector provider and can top up their budgets using their own income.

- Organisational & Operational Context: Other public-sector partners to fund their clients

This form of subsidised travel allows other public-sector partners to directly fund their clients through personalised budgets. Instead of centralising the service provision, the clients can decide how to spend their budget between the different public services that they need giving vulnerable people greater influence over their own lives. Therefore, contracts need to be established between these service providers and the public authority.

In order to adapt to the needs from different vulnerable user groups, it is necessary that the MaaS system shows tailored information on types of vehicle and driver profiles, thereby giving the users the option to pick the service that they feel more comfortable with.

The MaaS platform involves data sharing between public sector and private sector partners. The General Data Protection Regulation (*679/2016/EU*) (GDPR) must be adhered to when sharing and processing data relating to an individual's personal information, trips and financial information when monitoring and managing user's subscriptions and accounts.

Challenges and opportunities:

Actor	Challenges	Opportunities
Technology providers	Development, update and maintenance of the MaaS App in line with innovation and technology updates. Integration of many transport services with different operation and management schemes in the MaaS App. Provide payment functions that allow vulnerable users from different public sector clients to spend their personalised mobility budget in the transport mode that they prefer.	Create a fully integrated system with all the transport services available and a booking and payment system that allow users to have all the options in one go. Use the data collected from the App to continuously improve the service tailored to the user and provide mobility-related information to the public sector focused on user insights. Attract a new market of users (vulnerable users) and the share of subscriptions/booking payments this generates

PT service providers	Transition from traditional discount travel schemes to innovative subsidised payments through a MaaS App. Loss of service-based funding (service contracts) to be replaced by payments per trip (made by eligible users). Uncertainty of revenue.	Provide better PT connections through the MaaS App and the integration of other transport services. Use multimodal data collection from the App to improve the PT services taking into account information from the users.
Private transport service providers	Adapt the service offering to the user from traditional schemes to integration in a MaaS App. The integration in a MaaS App leads to sharing the platform with potential transport service competitors.	Enlarge the market share by the integration of the service with potential competitors. Collaboration with other transport services by sharing users' data to have a deeper user understanding. More opportunities for service providers not traditionally funded through service contracts. Direct payments to users give those users more empowerment and individual choice to demand transport. The private sector is therefore motivated to enhance promotion and marketing of service to vulnerable users.
Users	Digitally excluded are unable to use the service or receive the personalised budget in this platform. Users may spend their allocated budget too quickly or may not make best value choices. Some vulnerable users may have a lack of trust or difficulties when using the App	Have all the transport services easily available in one App anytime and everywhere. Freedom of choice of transport mode thanks to the personalised mobility budget. Some vulnerable users will be unable to manage their personal budgets and make informed choices. This offers an opportunity for community sector organisations to act as a broker between vulnerable users and providers.

Link and synergies with other Business Scenarios:

To maximise choice, especially in rural areas these need to not only include the conventional public transport services and taxis, but also flexible collective public bus services. The following scenarios should be integrated in the MaaS service, since they are services that cater to meet vulnerable users' needs and are consequently linked with new forms of subsidised travel through MaaS systems:

- BC5_S1: Commercially viable collective transport services that better meet vulnerable user demands
- BC5_S2: Not-for-profit collective transport services that better meet vulnerable user demands in rural areas
- BC4_S1: Public-private partnership ridesharing services using shared taxis
- BC4_S2: Peer-to-peer ridesharing services
- BC3_S1: Asset sharing in rural or peri-urban areas where the users of the asset are individual members of the public
- BC8_S1: Tailored mobile applications to reduce information barriers thereby increasing uptake and usability

  MaaS systems should provide easy and understandable information that meets vulnerable users' needs. Therefore, tailored mobile applications to reduce information barriers thereby increasing uptake and usability is a scenario that can complement very well a MaaS scheme with subsidised travel, creating a full structure of transportation service with purchase and information features.

Social and Demographic Barriers:

Target users	Social Factors	Significant barriers
Users with cognitive impairments (disabled or elderly)	Ability to use technology. Ability to understand information. Ability to pay	These users might find it difficult to use Apps to spend their personalised mobility budget, due to their potential lack of understanding of the technology, the information provided, and the innovative payment methods.
	Willingness to change habits	Users who typically receive traditional discount payments for transport services might not be comfortable with the idea of using discount payments though MaaS Apps.
Job seekers, Migrants, Low-income users, Children etc.	Lack of ICT infrastructure	Users without access to smartphones or mobile Internet plans might find it difficult to use these services

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

5.8 Business Concept 7 (BC7) - Provide Training and Assistance

To increase uptake of PT services there is a need to address confidence and information barriers through human dimension solutions. The user needs related to the human dimensions include the need for service provision to be empowering, empathetic, gender equitable, and safe. Solutions which address these needs involve ensuring that staff and volunteers who are in contact with vulnerable users have a means of recognising them, have a good understanding of their additional needs, and have knowledge of how to best deliver service to them. This includes greater recognition that less visible disabilities such as autism, dementia or anxiety can be just as much of a barrier to travel as a visible disability. The types of solution this can relate to include delivery of training to staff and/or to volunteers on interacting with users who have complex needs, introduction of some mechanism for identifying yourself as a user with complex needs, and travel support or accompanying services offered by providers using staff or volunteers. There are therefore two main types of human intervention to support independent travel by vulnerable users:

1. providing training to ensure public transport staff are aware of the needs and capabilities of different vulnerable users and can then provide appropriate support where necessary

2. empowering vulnerable users to travel independently by providing them with travel assistants to help them and teach them how to use the transport services in a safe manner and with confidence

5.8.1 Example Business Model solution for BC7_Scenario 1: providing staff awareness training to increase confidence and safety in using public transport services

The Budapest PL in INCLUSION is focused on different target groups with reduced mobility, such as blind and visually impaired, disabled, travellers with luggage or baby buggies, tourists and foreigners staying in Budapest long term. Since these social groups do not have equal opportunity to access and use public transport, Budapesti Közlekedési Központ (BKK), which is the transport operator in the city of Budapest, is providing overall knowledge and training to public transport employees who are in daily direct contact with the clients, about the transport related needs of people who are reduced in their mobility. Hence, the Business Model related to this scenario has been developed considering the experience of BKK in this scenario.

inclusion

BC7_BS1: Providing staff awareness training to increase confidence and safety in using public transport services

BM Canvas Table

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

1- Market & Customer Segments

Mass Market: Although there is a group of segmented customers with different needs to be understood by staff, the awareness training addresses the needs for all the PT service users. Particular focus is given to users with more complex needs and who may require additional assistance from staff.

User needs:

- Confidence barriers that prevent vulnerable users utilising PT services create the need for increasing **accessibility, empathy** and **safety.**

2- Vulnerable Users & Prioritised Areas

Public transport users with special needs (blind and visually impaired, disabled people, deaf and hard-of-hearing people, travellers with luggage or baby buggy).

3- Social Demographic Barriers

Improved staff awareness and better attitudes from staff lead to increased confidence to travel for vulnerable users.

4- Value proposition

Public transport service with better trained employees are more appropriate, more responsive for people with special needs.
Employees are able to understand the needs of users and they know how to help them.
Passengers find travelling by PT easier, more enjoyable, more dignified and less daunting.

5- Mobility Gaps Addressed

Reliability, Security and Safety concerns found by vulnerable users that use conventional PT services.

6- Communication & engagement

Direct contact with associations of people with special needs. They are able to help the public transport authority to reach and make contact with vulnerable people in order to understand their needs and design content for the training sessions.

Staff awareness training further helps ensure staff gain knowledge about the appropriate actions to take when serving a vulnerable user, (e.g. giving extra time for boarding or securing wheelchairs/sitting).

9- Key Resources

Staff that fully understands vulnerable users' needs to provide training.

Design of suitable training materials.

10- Key Activities

Provide training to all staff who have contact with vulnerable users.
Involving Associations of vulnerable groups for developing and upgrading training materials.

11- Key Partners

PT Operator
Associations of vulnerable users, Non-government organisations

7- Organisational & Operational context

Involving Associations of vulnerable groups for developing and upgrading training materials. Training the staff. Regular update of training materials and re-educate the staff. Awareness training should be provided to all staff who come into contact with vulnerable users during their journey, from ticket sales staff, to drivers, inspectors and customer service staff. Sensitive PT staff ensures better service and that is one of the keys to encouraging persons with special needs to use the service.

12- Cost Structure

Staff training
Producing training materials

8- Revenue Streams

The training needs to be public authority funded, or included as a requirement in service contracts, in which case it is funded by the PT provider within the contract costs for the service provision.

15- Social Innovation

Addressing vulnerable users' needs in staff training ensures an inclusive and efficient service provision.

13- Inclusion Principles/Goals

Empathy, Accessibility, Safety

14- Technology

Training platforms

Expanded description of key BM features:

- Vulnerable Users

Better staff awareness and improved attitudes towards vulnerable users help remove confidence barriers that prevent vulnerable users utilising conventional Public Transport services. Better trained staff can also lead to improved safety and feelings of security while travelling, which is of particular relevance to women and elderly passengers. Staff awareness training further helps ensure staff know the appropriate actions to take when serving a vulnerable user, such as giving extra time for boarding including securing wheelchairs/sitting and alighting for vulnerable passengers in wheelchairs or with mobility difficulties. This improved level of service may also remove the need for certain specialist client transport services for health or social service clients. Introducing travel assistance cards can help vulnerable users identify themselves to staff, who then are able to act and assist in an appropriate manner.

- Communication & engagement

A proper communication and engagement strategy is essential for the development and continuous improvement of this BM. The appropriate actions to take when serving vulnerable users depend on the needs and capabilities of the user when using PT services. In order to have a clear picture of these needs, it is important to directly communicate with associations of people with special needs who can help PT authorities to reach and make contact with vulnerable people and design a strategy that caters their needs.

Challenges and opportunities:

Actor	Challenges	Opportunities
PT Authorities and Operators	Understanding the more complex vulnerable users' capabilities and needs. Delivery trainings that encompass all the needs from the different vulnerable user groups.	Providing safer PT services for vulnerable users with special needs Enhance the feeling of empowerment and empathy towards vulnerable users that want to use PT.
Users	Users should trust PT services and staff in order to have reliability on the service (e.g. trust that someone will help them boarding, give them extra time, securing wheelchairs etc.)	Feel more included in the society since PT staff understands how to assist them when travelling. Feeling of safety increased since the risk of incidents is reduced by having proper assistance.

Link and synergies with other Business Scenarios:

- BC1_S1: All public transport bus services to be fully accessible

All public transport bus services to be fully accessible is a concept aligned with the equality legislation that requires all bus, rail and taxi vehicles available to the public to be accessible to disabled persons with a range of impairments by 2020. This requirement is crucial to promote

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

inclusivity for all public transport modes, but it should be accompanied by adequate staff awareness training to increase confidence and safety in using public transport services.

- BC5_S2: Non-for-profit collective transport services that better meet vulnerable user demands in rural areas

Non-for-profit collective transport services in rural areas are delivered in order to fill the gaps left by limited conventional PT services in these areas. Therefore, these services are meant to be very useful to many vulnerable users who need a flexible and accessible transport mode. Likewise, these services should provide awareness training to staff in order to ensure a quality service.

Social and Demographic Barriers:

Target users	Social Factors	Significant barriers
Users in wheelchairs (disabled) Users with mobility impairments (elderly, disabled)	Lack of empathy Lack of trust/confidence Attitudes and cultural acceptance	Although this service is designed to cater for the needs of users with disabilities (physical and cognitive), it is likely that some will still find a significant barrier when using accessible PT services with trained staff due to the potential issue of other passengers not understanding their often complex, needs and capabilities.
Users with cognitive impairments Visually impaired users	Ability to communicate	Cognitive and visual impairments lead to a barrier in communication with the trained staff and the difficulty of staff recognising particular conditions.
Tourists or migrants	Ability to communicate Ability to understand information Attitudes and cultural acceptance	Users who do not speak the local language might experience a barrier if the trained staff are not able to communicate with them. Previous negative experiences may make marginalised users reluctant to use public transport or ask staff for help.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

5.8.2 Example Business Model solution for BC7_Scenario 2: Providing travel assistants to enable use of public transport services

For vulnerable users with more complex sensory disabilities and cognitive/mental health impairments, heightened awareness of user needs by staff can only go part of the way to giving these users confidence and capability to travel independently. Those with more complex needs require some form of personal assistance. This Business Model has been developed based on three examples featured in the WP3 case study review work. These are listed in the table below.

INCLUSION examples	Comment	User Types	Area Types
6.4 Travel Buddy	Independent travel training and travel support to adults with a physical disability or mental health difficulty; Support provided by other adults with disabilities – fully trained and paid	Physically Disabled Sensory disabled Cognitive disability/mental health	Urban
6.2 Donostia - public transport for over 60s	Over 60's given training on how to use PT services; Workshops funded by public sector and delivered by community or private sector organisations	Elderly	Urban
6.3 Manchester - travel training	One-to-one teaching/mentoring of safe independent PT use to young persons with special education needs and disabilities; Uses paid training staff; Focus on social value generated; Long term reduction in costly specialist door-to-door travel	Young persons with mild cognitive impairment	Urban Peri-urban

BC7_BS2: Providing travel assistants to enable use of public transport services

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

1- Market & Customer Segments

Segmented customers: Travel assistants provision addresses customers with more complex sensory disabilities and cognitive /mental health impairments, or for persons needing extra support and guidance. Users have different needs and problems but with the common element of having difficulties using PT services independently.

User needs:

- Customers addressed in this BM have the need for more **accessible** and **safe** PT services in order to feel confident in using them.
- Customers do not feel comfortable in using PT services without assistants, creating the need for more **empathetic, empowering** solutions.

2- Vulnerable Users & Prioritised Areas

To be eligible for the service, users need to have a disability (learning disability, autism, physical disability, mental health difficulty, sensory impairment or a long-term health condition).
Be willing and able to travel using public transport.
Be physically able to walk short distances.

3- Social Demographic Barriers

Lack of empathy/awareness of vulnerable users' needs and abilities (drivers or passengers not comfortable in their company)
Potentially, there may not be a suitable travel buddy for everyone who needs one, due to the nature and variety of disabilities. This is a bigger challenge in rural areas.

4- Value proposition

To increase independent travel and confidence in using public transport for those with physical or mental health difficulties;

Widen friendship connections and social support network;

To reduce expenditure on specialist door-to-door provision by social care, health, or education sectors for their client trips

Creates employment as Buddies for individuals with physical or mental health difficulties

5- Mobility Gaps Addressed

Enables individuals who might otherwise find it too difficult to travel on public transport and access much-needed services to gain confidence in doing so, through having the empathy and assistance of fully-trained individuals who might have experienced similar challenges themselves.

People with disabilities who may have a strong aversion to travelling independently on PT may still rely on a dedicated service.

6- Communication & engagement

Communication would be by telephone and face to face.

Provision of information (for example: wayfinding, route planning and real-time travel information) would be provided and used with the travel buddies initially. This could take the form of digital content or paper copies, depending on the level of confidence of each user with technology.

9- Key Resources

The primary resource is people – i.e. those who become travel buddies.
Other resources are the provision of information (e.g. wayfinding, route planning and real-time travel info).
Budget resources needed for initial + ongoing training of travel buddies.

10- Key Activities

- Travel buddy recruitment
- Travel buddy training
- Marketing of the scheme to users/user representatives

11- Key Partners

Public sector partners in social services, charities or volunteer organisations who work with vulnerable users targeted for this scheme.
Public transport providers.
Public or private sector or community organisations that provide 'buddy' training

7- Organisational & Operational context

A formal organised communication network needs to be established which includes safety/security background checks on the travel buddies. Using paid staff as travel buddies helps ensure a professional service, however volunteers can be used where there is likely to be a shortage of suitable paid buddies (most likely in rural areas). If volunteers are used, then the vetting and training must be rigorous and close oversight provided by client services or vulnerable user representatives.
Sufficient provision of public transport and of walking routes are required to enable individuals to travel by these modes on a regular and/or frequent basis.

12- Cost Structure

Travel buddy recruitment, training and security checks; Salary payments for travel buddies.

Marketing and information for users (posters, leaflets, online advertisements, digital wayfinding, route planning, and real-time travel information content)

8- Revenue Streams

No revenues raised directly from users as no charge made to users for the service.

Budgetary constraints from local authorities makes funding the service difficult on a large scale.

May reduce need for expensive dedicated door to door transport for health or social services clients – possibility for public sector budget transfer to pay for travel buddies.

15- Social Innovation

Persons from a vulnerable group are employed to help others from the same group – learning from shared experience.

13- Inclusion Principles/Goals

Accessible, empowering, empathetic, safe, gender equitable.

14- Technology

Optional provision of digital information (e.g. wayfinding, route planning and real-time travel information).

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

Expanded description of key BM features:

- Organisational & Operational context

It is essential to establish a formal organised communication network which includes safety/security background checks on the travel buddies. Providing training and using paid staff to the travel buddies ensure a professional service. This is a strong characteristic of the service, since it is very important to ensure reliability of this service by the users to travel independently and access healthcare, work, employment and leisure opportunities. The support is usually offered by trained assistants. However, in some cases such as the Travel Buddy Service in Hounslow, the support is offered by travel buddies who are adults with disabilities that have experienced similar challenges themselves.

Challenges and opportunities:

Actor	Challenges	Opportunities
Public Transport providers	Understanding the more complex vulnerable users' capabilities and needs in order to provide adequate assistants that meet these needs. Ensuring other physical barriers to travel are removed through use of suitable accessible vehicles.	Improve PT accessibility and inclusivity by providing adequate assistants to help vulnerable users travel independently and with confidence. Understanding of user needs through direct telephone and face-to-face communication. Reduce expenditure on specialist door-to-door transport provision
Assistants (social services, charities or volunteer organisations)	Diverse needs and capabilities to be understood and the respective action to help in a more adequate manner. Attracting appropriate staff/ volunteers and conducting thorough vetting	Boost social community feeling by helping the ones with more difficulties. Enlarge buddies for vulnerable users' market segment. In addition to providing travel assistants to accompany vulnerable users while using PT, travel training can be provided on how to use PT services and on the use of technologies that aid the use of PT services.
Users	Users' empowerment to use PT independently.	Social inclusion in transport services for vulnerable users that need more independence and freedom. Possibility to use services more affordable than expensive-to-procure door-to-door services.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

Link and synergies with other Business Scenarios:

- BC8_S1: Tailored mobile applications to reduce information barriers thereby increasing uptake and usability

The information provided by tailored mobile applications is certainly a complement to the provision of travel assistants. Mobile Apps that are built on existing journey planning apps and travel information tools to ensure content provided is useful and understandable for vulnerable users can assist many travellers with particular situations in which they need help. Besides, virtual travel assistants are also an option for vulnerable users with more complex needs. However, users with more complex needs that are not confident travelling on conventional PT services are a customer segment that can be motivated to use PT services if they are provided with assistants that act on a professional scheme and understand their needs.

- BC1_S1: All public transport services to be fully accessible

Equality legislation requires all bus, rail and taxi vehicles available to the public to be accessible to disabled persons with a range of impairments by 2020. This legislation is fully in line with the provision of travel assistants to enable the use of PT services and it is necessary for the assistance service to work in a proper manner. Particularly, the provision of travel assistants has the objective of providing guidance which enables the individual to gain confidence in independently using the service on future occasions. This confidence gain is not possible if the vehicles are not adapted to vulnerable user needs.

- BC5_S2: Not-for-profit collective transport services that better meet vulnerable user demands in rural areas

Given the appropriate training on how to assist vulnerable users, drivers of door-to-door collective transport services in rural and peri-urban can often remove the need for dedicated travel assistants as the flexible door-to-door nature of these services means the driver can also act as the travel assistant. This is only possible for trips where connections to or from other services are not necessary.

Social and Demographic Barriers:

Target users	Social Factors	Significant barriers
Users in wheelchairs (disabled) Users with mobility impairments (elderly, disabled)	Lack of trust/confidence	Although this service is designed to cater for the needs of users with disabilities (physical and cognitive), it is likely that they find a significant barrier when using accessible PT services with travel assistants, due to the potential lack of trust/confidence in the service because of their complex needs and capabilities and previous negative experiences.
	Lack of empathy	If the travel assistant does not experience the same difficulties as the passenger, then there may be a lack of understanding of certain specific needs.

Users with cognitive impairments Visually impaired users	Ability to communicate Ability to understand information Feeling of personal insecurity	Cognitive and visual impairments lead to a barrier in communication with the travel assistant and the difficulty of understanding the information. It is especially important that passengers with cognitive and visual impairments can fully trust the travel assistant. Thorough vetting is necessary.

5.9 Business Concept 8 (BC8) - Tailored Information

Tailored information in the form of printed materials that are easy to understand by vulnerable users is important to raise awareness of travel options available to vulnerable users with specific requirements and who do not have access to information via mobile apps. This also includes information made available at stops/stations and in-vehicles. Additionally, tailored audio information at stops/stations and in vehicles can provide valuable assistance to vulnerable users with reading or sight impairments.

Technology solutions in the form of mobile applications can reduce information barriers, thereby increasing uptake and usability. Technology can also be applied to improve the quality of information that is made available to vulnerable users on the travel and mobility choices that are available to them, with the information tailored to their capabilities. Using technology to provide information tailored to their needs can empower vulnerable users to help them to travel independently in a safe manner and with confidence.

5.9.1 Example Business Model solution for BC8_Scenario 1: Tailored information (visual or audio) to raise awareness of options available or provide journey assistance

This BM involves provision of easy to understand information in the form of printed leaflets, maps, or signage at stops/stations and on-vehicles. It also includes providing audio messages at stops/stations and in vehicles to assist those with reading or sight impairments. Audio messages in multiple languages can also assist those that are not native language speakers. In most cases these are relatively simple and inexpensive interventions to produce but require detailed knowledge of vulnerable user requirements and the best way to communicate messages to the target groups. This Business Model has been developed based on an example featured in the WP3 case study review work, listed in the table below.

INCLUSION examples	Comment	User Types	Area Types
7.11 Showing the way in Toulouse using pictograms	Low cost system of signage using pictures at stations; symbols give a visual representation of a concept linked to the name of the station; accompanying journey planning app incorporating the pictures	Cognitive disability Migrants Children	Urban

BC8_BS1: Tailored information (visual or audio) to raise awareness of options available or provide journey assistance

BM Canvas Table

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

1- Market & Customer Segments

Mass Market: Although there is a group of segmented customers with certain more heightened needs, the provision of clear and easy to understand information benefits all PT service users.

User needs:

- Confidence and knowledge barriers created by the lack of tailored information that prevent vulnerable users utilising PT services create the need for increasing **accessibility, empowerment** and **empathy.**

2- Vulnerable Users & Prioritised Areas

Disabled persons
Elderly
People with reading difficulties
Migrants / Non-native language speakers / Children

3- Social Demographic Barriers

No local networks available.
There is little support by the networks.

4- Value proposition

Makes it easier to use PT services reducing confidence barriers.

Raises awareness of services that are vulnerable user compatible.

Universal design principles ensure information is suitable for all.

5- Mobility Gaps Addressed

Become aware of the service and understand how to use it.

6- Communication & engagement

Requires cooperation and consultation between multiple modes, providers, public sector actors and vulnerable user groups to ensure consistent and appropriate information is delivered to vulnerable users.

Leaflets about the service sent to different public locations, homes for the elderly and customer offices of transport provider.

Audio messages at stops/stations and in vehicles to assist those with reading or sight impairments. Audio messages in multiple languages can also assist those that are not native language speakers.

Workshops with vulnerable user groups to understand how to explain information and how to use services to different user groups.

9- Key Resources

Public sector fund and co-design workshops.

Create, print, and distribute leaflets and other materials.

10- Key Activities

Contact to networks.

Presentations and practical use of the service at customer workshops.

11- Key Partners

Transport provider.

Local networks for elderly or disabled persons.

7- Organisational & Operational context

Private sector transport providers should ensure that information about their services is produced in formats that are understandable by all users and should contain information necessary for users with specific needs to be able to make use of the service. Where information relates to signage at stops or stations where the transport authority has responsibility, then funding the improved or additional information that is needed should come from the public sector. Use of pictures or icons wherever possible instead of text. The public sector should also fund the co-design workshops that are necessary to fully understand the needs of different vulnerable users in order that the most suitable information provision can be produced.

12- Cost Structure

Leaflets.
Presenter at local homes for the elderly.
Efforts to contact networks.

8- Revenue Streams

Revenues by people using the service (depending on the public service contract and the local fares).

Public sector funding for co-design workshops and stop/station audio/visual information.

15- Social Innovation

More informed and tailored end user services.

13- Inclusion Principles/Goals

Accessibility, Empowerment, Empathy

14- Technology

Personal information.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

Expanded description of key BM features:

- Organisational & Operational context

Providing tailored information for vulnerable users requires cooperation and consultation between multiple modes, providers, public sector actors and vulnerable user groups to ensure consistent and appropriate delivery of information. This is often the main barrier to providing such information and the lack of legislation relating to this area results in often limited and piece-meal efforts to enhance or improve on standard information developed for the wider public. Under equality legislation, transport providers have a duty to make reasonable adjustments to the way vehicles are operated so that disabled people can use services; however, there is nothing specific to providing information in the legislation. Some EU states are in the process of conducting consultations on provision of accessible information for bus and/or public transport services (e.g.: https://www.gov.uk/government/consultations/bus-services-act-2017-accessible-information).

Challenges and opportunities:

Actor	Challenges	Opportunities
Transport providers and authorities	Find the adequate information and channel of communication to feasibly transmit the necessary information in the most efficient manner. Lack of cooperation and consultation between multiple modes, providers, public sector actors and vulnerable user groups to ensure consistent and appropriate information is delivered to vulnerable users	More inclusive transport thanks to the tailored information addressed to vulnerable users. Reduce expenditure on specialist door-to-door transport provision
Users	Lack of clear instructions about the provision of different information items available.	Allows vulnerable users to understand the PT services available to them and provides knowledge on how to use the services through use of tailored information and personalised workshops to communicate the information

Link and synergies with other Business Scenarios:

- BC7_S2: Providing travel assistants to enable use of public transport services

The potential synergy is the aim to increase independent travel and confidence to use public transport for vulnerable users in both BMs. In this case, using easy-to-understand tailored information available, and in BC7_S2, using travel assistants. Travel assistants will benefit from having tailored information available to help explain to the vulnerable users how to use the services without support in the future.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

- BC2_S1: Crowdsourced data capture to identify where improvements to PT services are needed

By capturing different users' needs through crowdsourced data, more tailored information can be developed and included in different PT services. Also, crowdsourced apps can be used as an information channel to help better understand local offers. Through these apps, customers could also ask questions if they don't understand some points.

- BC8_S2_ Tailored mobile applications to reduce information barriers thereby increasing uptake and usability

The common objectives with BC8_S2 is to provide useful and understandable tailored contents that makes vulnerable users feel more empowered. New technology-based solutions using mobile apps offer a more responsive and adaptive platform for providing tailored information for different vulnerable users' needs.

Social and Demographic Barriers:

Target users	Social Factors	Significant barriers
Users in wheelchairs (disabled) Users with mobility impairments (elderly, disabled)	Lack of empathy	In the case of the information provided not meeting the user needs and capabilities, the consequent lack of empathy is a potential barrier for users with disabilities.
Users with cognitive impairments Visually impaired and deaf users Migrants and tourists	Ability to understand information	The channel of communication used for disseminating information might not be suitable for some vulnerable users with specific difficulties.

5.9.2 Example Business Model solution for BC8_Scenario 2: Tailored mobile applications to reduce information barriers thereby increasing uptake and usability

The Florence INCLUSION Pilot Lab is included in the area covered by Metropolitan Florence Authority and it aims to improve PT services provided by BUSITALIA and ATAF (controlled company of BUSITALIA) within the service contract subsidised by the Regional Government (for the metropolitan area) and the Metropolitan Authority. Hence, the services offered by BUSITALIA and ATAF aim to improve the inclusivity of transport in these areas. One of their actions is to improve the Florence ATAF 2.0 Travel Information App with its enhancements to make it easier for vulnerable user groups to understand and use (e.g. migrants being the main target group in the pilot demonstration). The business model that follows has been developed by experience with the Florence pilot lab and a number of case studies featured in WP3 as listed in the table below.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

INCLUSION examples	Comment	User Types	Area Types
7.1 Aira app	Wearable smart glasses providing guidance and remote assistance (connecting to human agent) to blind persons; Venture capital funding; Monthly subscription fees for users sufficient for commercial operation	Sensory disabled;	Urban
7.4 Be My Eyes app	Free to use app that connects blind users to a network of sighted volunteers; uses video conferencing technology; uses gamification rewards to volunteers; developed with crowdfunding and donations	Sensory disabled	Urban Deprived urban Peri-urban Rural
7.13 Wher app	City map app allowing women and LGBTQ+ users to review and share travel options and their safety; Developed through sponsorship; Long term funding through private sector sponsors and user subscriptions; uses open and crowdsourced data	Women	Urban
7.3 Barrier-free digital journey planner in Berlin	Public sector funded. Also requires suitable data maintenance programme involving PT operators + city authorities to feed the planner	Physically Disabled; Elderly	Urban
7.2 APP&Town Compagnon	Multimodal journey planner customised to each user's capabilities; Supported by tutor; Requires well developed PT network. Funded through public private partnership	Mild cognitive impairment; Physically disabled; Sensory disabled	Urban
7.9 Route4U	Route guidance App for wheelchair, pram and bikes; Development funding by private sector investments; Utilises crowdsourced information on barriers/obstacles; Partner with cities. Public private partnership covers operational costs	Physically disabled; Families with young children	Urban

inclusion

BC8_BS2: Tailored mobile applications to reduce information barriers thereby increasing uptake and usability

BM Canvas

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

1- Market & Customer Segments

Segmented customers: Both enhanced information in apps and virtual travel assistants address users with slightly different needs and capabilities, but always with the similarity of having particular needs when using PT services.

User needs:

- The lack of reliability towards PT services targeted by this BM shows the need for more **empowering** and **empathetic** solutions to increase trust in PT.
- Users with more complex needs have the need for more specific information, which can be offered by virtual travel assistants.

2- Vulnerable Users & Prioritised Areas

Technology providing tailored information can benefit all vulnerable user groups but in particular: sensory disabled; elderly; physically disabled, migrants; women.

3- Social Demographic Barriers

Lack of knowledge about the existence of specific applications
Digital exclusion (not owning a mobile phone with internet access)

Difficulty in understanding how to use the provided technology and/or the information reported in the app

Intolerance of extra time or effort required to accommodate certain types of vulnerable users (extra effort to communicate with non-native language speakers)

4- Value proposition

Useful and understandable contents that makes the vulnerable users feel more secure and encouraged to use the transport service

Better communication of the data to vulnerable users, for example by more understandable information concerning general transport conditions, travel tickets, information about POIs, location of bus stops, reliable real-time information, etc.

5- Mobility Gaps Addressed

More understandable information provision (simpler vocabulary and symbols) concerning: i) the terms and conditions of transport services (how and where to purchase tickets, rules about subscriptions, conditions for fines, maps of bus stops, etc) and ii) the behaviour to be adopted on the buses. More reliable services.

6- Communication & engagement

Co-participatory process characterised by a strong user-centred approach involving experts and technicians from the transport company and the vulnerable users' communities' representatives to collect information on how to improve information included in the mobile support APP, especially for the transport and mobility information.

Involvement of professional service design facilitators to ease the communication and encourage the active involvement of specific target groups (e.g. migrants having a limited/very basic knowledge of the language, non-native speakers).

Promotion of the app by developing some focus groups with vulnerable users.

Development of a promotional campaign via local newspapers, leaflets, etc. for raising awareness about the new features of the app.

9- Key Resources

Technology experts that develop (or update) the App functionalities.
Professional facilitators helping 1) the collection of major user needs and 2) the promotion of the app to vulnerable users and their training in the use of the app.

10- Key Activities

Focus groups and workshops with vulnerable users for understanding their issues when travelling.
Discussions with app providers for analysing how to develop (or update) the app.
Promote the App and be proactive in updating and adapting info provided

11- Key Partners

Technology company
Public transport operator and Authority
Vulnerable users' community organisations
Specific associations which could help better understand migrants' needs.

7- Organisational & Operational context

There are some circumstances where these technologies can be delivered on a fully commercial basis through user charges/subscriptions but in general, public private partnerships offer the best means of delivering these. Within the partnership, the public-sector shares data on services and user requirements and the private sector developers build and deliver the services to users for a fee paid by the public sector.

In terms of delivery, the main aspects are related to the management and operation of the IT platform for providing the different mobile APP services.
From the organisational point of view, it is necessary to involve a specialised figure for managing and maintaining the platform and related communication technology;
From the operation side, it is necessary to involve actors involved at the community level for analysing whether the contents provided are understandable and benefit all users.
It is also important to guarantee the presence of a unique entity for managing the different mobile applications offered to the users.

12- Cost Structure

The most expensive resources are related to IT technology investment, maintenance and operations.
Other minor costs are related to the communication and promotional activities with the users

8- Revenue Streams

Increased revenues from PT services due to higher number of passengers.
Reduction of the demand for dedicated services
Advertisement in the app; Crowdfunding and sponsorship may provide additional revenue streams.

15- Social Innovation

More informed and tailored user information services for target vulnerable users

13- Inclusion Principles/Goals

Empowerment, Empathy, Accessibility

14- Technology

Tailored information through the APP; integration of new functionalities in existing APPs for mobility and PT services information

Expanded description of key BM features:

- Market & customer segments

There are two market segments clearly differentiated in this Business Model:

- Users that can benefit from enhancement to existing journey planning apps and travel information tools to ensure the content provided is useful and understandable for vulnerable users. This means including data on accessible vehicles and accessible routes in stops and stations; ensuring intermodal journey information with real time updates is available in rural areas where connections are necessary between flexible collective and shared ride services and the infrequent conventional public transport services; and providing content in languages and using icons and pictograms instead of long text for non-native speakers, etc.
- Users with more complex needs that need tailored travel information using Apps that also connect to virtual travel assistants who offer support and guidance while travelling. These are designed for users with more complex travel needs, such as sensory disabilities or some mild cognitive impairments.

Challenges and opportunities:

Actor	Challenges	Opportunities
PT Operators and Authorities	Understanding the more complex vulnerable users' capabilities and needs in order to provide adequate technology to help meet these needs. Promotion of the App to vulnerable users and their training for the use of the App	Improve PT accessibility and inclusivity by providing easy-to-access information through a mobile App to help vulnerable users travel independently and with confidence. Virtual assistants (through the App) and focused groups or workshops (in situ) to better understand user needs. Reduce expenditure on specialist door-to-door transport provision
Technology providers	Technology experts to develop and update apps according to vulnerable users' needs.	Enlarge the market segment of App development for information provision to vulnerable users.
Users	Digitally excluded are unable to use the technology due to lack of phone or connectivity. Some vulnerable users may have lack of trust and difficulties when using the App	Social inclusion in transport services for vulnerable users that need more independence and freedom

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

Link and synergies with other Business Scenarios:

- BC7_S2: Providing travel assistants to enable use of transport services

As mentioned in the development of the Business Model, vulnerable users with more complex needs should be able to connect to virtual travel assistants who offer support and guidance while travelling. The presence of these virtual travel assistance is already linked with BC7_S2 itself. However, some vulnerable users may not feel fully comfortable with travelling by conventional PT even with the virtual travel assistants. Therefore, in order to address more complex needs that require in-person assistance, the concept of providing travel assistants to enable use of transport services should be also granted. The synergies created between these concepts are aimed to reduce accessibility barriers and improve vulnerable users' reliability when using PT services.

- BC2_S1: Crowdsourced data capture to identify where improvements to PT services are needed

Crowdsourced data capture to identify where improvements to PT services are needed is a concept that is directly linked with the development of tailored mobile applications that enhance existing journey planning apps and travel information tools for obvious reasons. In order to improve PT services through this type of App, data captured through this App can be essential when identifying potential changes.

- BC6_S1: New forms of subsidised travel through MaaS systems

The integration of tailored information functionalities into MaaS systems creates a synergy between both concepts in which both transport mode decision and real time information provision are improved and can benefit the user from a single platform.

Social and Demographic Barriers:

Target users	Social Factors	Significant barriers
Users in wheelchairs (disabled) Users with mobility impairments (elderly, disabled)	Lack of empathy; Lack of trust/confidence	If the information provided through the App does not meet the user needs and capabilities, the consequent lack of trust/confidence is a potential barrier for users with disabilities. Also, there is a potential lack of empathy if virtual travel assistants do not understand the vulnerable users' needs in real time.
Users with cognitive impairments Visually impaired and deaf users Elderly	Ability to understand information; Ability to communicate; Ability to use technology	If the App does not provide information in an inclusive way, these users might not be able to understand the information. If the user has difficulties in communicating with virtual travel assistants, they may not find the service useful.
Migrants Low income	Lack of ICT infrastructure	Not having access to smartphones or mobile internet plans creates a barrier for accessing this solution.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

6 Conclusions

In this Deliverable, 14 different business models (BMs) have been identified and developed based on 8 business concepts to support accessible and inclusive mobility.

Each business model relates to a particular type of solution and provides a detailed description of the key information concerning: main market targets; value proposition; actors involved; communication / engagement strategies; identification of costs and revenue including funding mechanism; the activities required for setup and delivery, etc. Each BM has been developed following a common template developed by the consortium partners.

The set of 14 business models provides a holistic package of solutions for accessible, inclusive and equitable mobility in prioritised areas. Some business models have strong dependency on others and should be delivered as a combined solution. Others complement each other and, although they can be delivered as stand-alone solutions, they can become more effective and benefit a greater number of vulnerable users through combined delivery. These synergies and dependencies have been identified in the business model descriptions.

It has been identified that social factors experienced by particular demographic groups of the population can present significant barriers to the adoption and uptake of certain solutions. Social-demographic barriers have been identified for each business model, to highlight potential challenges and barriers to use by certain target groups. Across the business models, common social factors spanning demographic groups that lead to barriers to use include:

- Willingness to change habits
- Lack of trust/confidence
- Aversion to uncertainty

This highlights the importance of user engagement through education and promotion by trusted stakeholders for all business model solutions. It also highlights the importance of co-creating solutions with the target users so that solutions are developed that are really wanted and needed, rather than the supply side trying to convince the users to change their habits because of what is available to them.

Within each business model, key weaknesses and opportunities are highlighted. These are presented in relation to the main actors involved in the business model and include: public sector authorities; private sector transport providers; technology providers (where applicable); volunteers or assistants (where applicable); and vulnerable users. This indicates potential for transferability between target users and to other prioritised areas and also highlights where new technology or social innovation can increase the effectiveness and/or the acceptance of the solution.

The business models described in this Deliverable have been developed assuming delivery under normal circumstances. The impacts and effects of Covid-19 are not incorporated in these business models, largely because these were unknown at the time of development and because they are likely to vary considerably between locations. However, the challenges and opportunities emerging from the Covid-19 pandemic and how these impact on the candidate business models will be considered in the transferability assessment conducted in the next activities in work package 6.

This leads into the next phase of the work in WP6 which is to explore in more detail the business models which, based on the knowledge gained through the INCLUSION project, are most likely to deliver positive impacts to vulnerable groups in prioritised areas. This will also provide a more rigorous assessment of transferability potential. The outcome from this final WP6 activity will be reported in *D6.2 Recommendations on the transferability of the proposed business models* due in Month 36 of the project (end September 2020).

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

Appendix A -Expanded Scenario Descriptions

BC1_Scenario 1: All public transport bus services to be fully accessible

Delivery mechanism: For regulated environments and for non-commercial conventional services in deregulated environments, the suggested delivery mechanism ensures that accessible vehicle specifications are included in service contracts awarded to private sector providers.

For deregulated environments, commercially viable services operated by the private sector do not involve service contracts and the public sector can only work with the private sector to encourage them to adapt services for vulnerable user's needs. Involving private sector providers in engagement with users can aid in this process. However, the public-sector influence is limited to providing guidance on good practice and on reasonable adjustments for vulnerable users in addition to monitoring adherence to legislation.

In rural, and to some lesser extent peri-urban areas, there are few conventional public transport services. Some intercity fixed route bus and train services may bisect the area operating on a commercial basis. In addition to this, there is likely to be a limited number of fixed route non-commercial bus services operating under a service contract, usually provided by private sector but sometimes community sector providers. As service contracts in rural areas only apply to a small number of services providing a very limited coverage, other approaches to ensuring accessible vehicles are used on other forms of public transport are also required. The case study review shows that this is often achieved through public sector grants used to purchase accessible vehicles for use by not-for-profit providers on 'community bus' services. This approach is described in the 'Asset Sharing' business scenario (see *BC3_S3: Asset sharing of buses where the users of the asset are organisations providing a service for members of the public).*

Financing: Within service contracts, the public sector invites tenders from private sector operators or community sector organisations to provide a specific service under contract. Private sector operators or community organisations bid to provide the specified service for an agreed contract payment. The public sector then selects an operator and awards the contract. The successful private sector operator or community organisation then operates the service according to the contract specification. The public-sector monitors performance and adherence to contract conditions. Improving the ability of vulnerable users to travel on the conventional public transport network can result in fewer trips by vulnerable users on specialist door-to-door services, thus saving public sector spending which can be diverted to finance the increased service contract costs.

Target User Groups: Physically disabled; Elderly; Sensory disabled; Families with young children

Legislative considerations: Equality legislation requires all bus, rail and taxi vehicles available to the public to be accessible to disabled persons with a range of impairments by 2020. This has been partly adopted in urban areas, but not on all services. Transport providers also have a duty to make reasonable adjustments to existing vehicles by adding auxiliary aids or equipment such as audio-visual passenger information, priority seating and contrasting handrails. Furthermore, under equality legislation, transport providers have a duty to make reasonable adjustments to the way vehicles are operated so that persons with disabilities can use services. E.g. a bus driver telling a visually impaired person when they have reached their stop.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

EU Directive 2004/18/EC (Article 26) specifically allows public authorities to introduce contract performance requirements relating to social and environmental considerations, provided that these are publicised in advance. It is recommended that this be used as a means to encourage transport providers to submit tender bids that include 'added value' components (e.g. accessible vehicles and staff awareness training) which address the needs of vulnerable users. Authorities can then include an assessment to weigh up and compare different kinds of social benefits (including meeting vulnerable users' needs) being offered by tenderers when awarding the contracts. Contracts with a value greater than €139,000, excluding VAT, usually must be awarded through competitive procedures (tenders)[8].

- WP3 Case Studies Reference

INCLUSION examples	Comment	User Types	Area Types
8.3 Rennes wheelchair accessible public transport	Information at stops and in vehicles is provided audibly and visually; entire PT network accessible for those with impairments; complemented by on-demand door-to-door service for blind and physically disabled	All users Physically disabled; Sensory disabled Elderly	Urban
9.2 KOLLA (Kollektivtrafik för alla) project	Public sector-initiated redesign of entire PT provision to make entire network fully accessible; Includes service contracts with requirements on vehicle design and a flexline service; Staff awareness training and travel assistants also included	All users Physically disabled; Sensory disabled Elderly	Urban

---

[8] https://europa.eu/youreurope/business/selling-in-eu/public-contracts/public-tendering-rules/index_en.htm

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

BC2_Scenario1: Crowdsourced data capture to identify where improvements to PT services are needed

Delivery mechanism: For the travelling public, smartphones are now ubiquitous, with GSMA estimating over 85% adoption by European residents in 2017. This scenario looks to take advantage of this by providing a means for public transport passengers, including vulnerable users, to share crowdsourced information from bus passengers using smart phone apps. This information will inform bus providers of issues faced by passengers /passenger groups when using their services, resulting in beneficial changes to service planning, service delivery and improved customer relationship management. The crowdsourced data can also be shared amongst other users to allow passengers to help each other, resulting in an improved passenger experience. Information that can be shared through the technology can relate to levels of crowding, lack of wheelchair spaces, driver attitudes and awareness levels, bus cleanliness, accessibility issues at stops and stations, difficulties purchasing tickets, etc. This can not only provide valuable information to the providers of the service to identify where budgets should be diverted for maximum benefits.

Where technology solutions have been developed to make travel easier for certain vulnerable users, it is often the case that the technology is developed by the private sector and then sold to public sector authorities to utilise in their cities/regions.

While the delivery of these digital solutions is predominantly through private sector technology companies, their initiation may come from private sector transport providers where commercially viable or through public sector funding.

Financing: Private sector developers initiate technology solutions using venture capital investments and delivered commercially or through public private partnership funding. Commercial delivery can occur in situations where a commercial public transport provider initiates the commissioning of the app (the information obtained from the crowdsourcing app leading to service improvements with commercial benefits).

Additional to this, there are significant costs incurred by transport authorities or providers to improve infrastructure or adjust service provision that addresses the needs of vulnerable users and removes problems experienced by vulnerable users when travelling. The information from crowdsourcing apps helps to identify the priorities for allocating limited budgets to make improvements as well as identifying the quick and cheap fixes. As a result, in most cases it is likely that public private partnerships provide a suitable mechanism to deliver these crowdsourcing app technologies where the public sector pays the private sector technology company to implement their app to citizens in their city, with the public-sector benefit coming from the data generated, which helps inform planning decisions that improve future service provision for vulnerable users. To deliver this in an effective manner requires engagement between the private sector to enhance their travel information apps to capture users' needs, and to share these with public sector transport authorities who then need to commit to invest time and budget to make necessary improvements.

Target User Groups: All passengers; Physically Disabled; Elderly; Sensory disabled; Families with young children.

Legislative considerations: Data collected from transport systems have traditionally been non-personal data, such as vehicle flows. However, privacy concerns have emerged in the context of the

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

growth in the collection of personal data by the private and public sectors. The collection, storage and processing of personal data is regulated by the General Data Protection Regulation (EU) 2016/679 (GDPR), a regulation in EU law on data protection and privacy. The GDPR aims primarily to give control to individuals over their personal data and contains provisions and requirements related to the processing of personal data of individuals (formally called data subjects in the GDPR) who reside in the EEA, and applies to any enterprise—regardless of its location and the data subjects' citizenship or residence—that is processing the personal information of data subjects inside the EEA. Controllers and processors of personal data must put in place appropriate technical and organizational measures to implement the data protection principles and provide safeguards to protect data (for example, using pseudonymization or full anonymization where appropriate). Data controllers must design information systems with privacy in mind, for instance using the highest-possible privacy settings by default, so that the datasets are not publicly available by default and cannot be used to identify a subject. No personal data may be processed unless this processing is done under one of six lawful bases specified by the regulation (consent, contract, public task, vital interest, legitimate interest or legal requirement). When the processing is based on consent the data subject has the right to revoke it at any time.

- WP3 Case Studies Reference

INCLUSION examples	Comment	User Types	Area Types
WP4 Florence ATAF 2.0 app feedback from user's function	ATAF2.0 App enhanced to allow user reporting of incidents and issues while travelling in i) the deprived urban Municipality of Campi Bisenzio for people with migrant background, and ii) the rural area of S.Piero for rural commuters. This information will be used by PT operators and transport planning authorities to improve service provision, thanks to a better understanding of user needs.	Migrants Rural students Rural Commuters	Deprived Urban Rural

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

BC2_Scenario 2: Big data analysis to better identify where demand for transport services exists

Delivery mechanism: The use of online social network platforms has seen rapid growth in tandem with the increasing adoption rates of smartphones. According to StatCounter, as of July 2019 nearly 79% of Europeans used Facebook, 9% used Pinterest, and just over 5% used Twitter, with the majority of interaction taking place on mobile devices (StatCounter Global Stats 2019).

This scenario involves possibilities where digital solutions, based on analysing large quantities of readily available data from digital social media, play a part in the process of identifying the potential for, and design of, commercial collective transport services. Information mining from Social Networks on travel desires and needs can provide a better comprehension of the demand and can radically improve the uptake of bus ride-sharing services, through better design and aggregation of demand offering more tailored services for vulnerable groups. This solution is especially suited to identification and aggregation of demand to large scale events, particularly those attended by younger people – because they are most active on social media.

Private sector technology companies develop social media data analysis models for demand prediction that allow private or public-sector bus operators to gather a better understanding of the latent mobility demand to specific events (in terms of geographical location) prior to event ticket purchase. This information is then used to provide more informed design and delivery of tailored collective transport services (see *BC5_S1: Commercially viable collective transport services that better meet vulnerable user demands)* that better meet the demand and increase the overall transport accessibility.

Financing: Private sector technology providers develop the data analytics tools using venture capital investments. If demand is sufficient to support commercially viable collective bus services then private sector bus operators commission use of the data analytics tools to inform the design of the bus service to serve the areas/routes with highest demand. Where the transport service cannot generate commercially viable operations then public-private partnership funding may be suitable for commissioning the use of the data analytics tools and contracting services where there is an identified social value in providing the service.

Target User Groups: Young persons, students, women

Legislative considerations: The collection, storage and processing of personal data is regulated by the General Data Protection Regulation (EU) 2016/679 (GDPR), a regulation in EU law on data protection and privacy. The GDPR aims primarily to give control to individuals over their personal data and contains provisions and requirements related to the processing of personal data of individuals (formally called data subjects in the GDPR) who reside in the EEA, and applies to any enterprise—regardless of its location and the data subjects' citizenship or residence—that is processing the personal information of data subjects inside the EEA. Controllers and processors of personal data must put in place appropriate technical and organizational measures to implement the data protection principles and provide safeguards to protect data (for example, using pseudonymization or full anonymization where appropriate). Data controllers must design information systems with privacy in mind, for instance using the highest-possible privacy settings by default, so that the datasets are not publicly available by default and cannot be used to identify a subject. No personal data may be processed unless this processing is done under one of six

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

lawful bases specified by the regulation (consent, contract, public task, vital interest, legitimate interest or legal requirement). When the processing is based on consent the data subject has the right to revoke it at any time.

- WP3 Case Studies Reference

INCLUSION examples	Comment	User Types	Area Types
WP2 Rhein Sieg Concept to use social media data to identify demand for safe cycling routes	Public sector transport authority would contract the private sector technology developer/data analysts to identify from digital social media data the locations where safe cycle infrastructure/routes are most needed for school pupils. This would be suited to a public-private partnership funding approach.	Students	Urban Peri-Urban

BC3_Scenario 1: Asset sharing in rural or peri-urban areas where the users of the asset are individual members of the public

Collective asset sharing with members of the public refers to initiatives such as bike-sharing, e-bike sharing, scooter sharing, moped sharing and car sharing clubs where the asset is collectively owned and is made available to individual users for a fee or hire charge.

In urban areas, these schemes are predominantly operated by private sector providers on a commercial basis. The private sector provider purchases the vehicles and makes them available via technology platforms for members of the public to use as and when required. Payment is usually based on hourly rates of use, often in conjunction with a monthly or annual membership fee. Asset sharing of two-wheel scooters, bikes, and e-bike services offer a relatively cheap and convenient method of transport in cities for short journeys and for first and last mile connections to the public transport network. The large numbers of hire bikes and scooters available in cities gives good connection, especially in central areas, but less so moving away from the centre. Car share services are useful for longer journeys, family trips and supermarket shopping trips for those without access to their own vehicle. In general, these services offer alternatives to private car ownership when introduced to urban areas with good quality public transport coverage. They are used by young adults and students or are used by tourists who have no access their own vehicle. They are generally not provided to meet needs of vulnerable users.

In peri-urban and rural areas the demand from individuals for collective asset sharing services is not sufficient for commercially viable operation from private sector providers. As a result, financial support is required in some form or other to establish collective asset sharing services. This financial support offers the leverage to ensure asset sharing services are designed and delivered with certain vulnerable user needs in mind.

Delivery mechanism: One approach to this in peri-urban and rural areas is where the public sector purchases the shared assets (bikes / e-bikes / cars etc.) but partners with private sector or community organisations that own suitable premises and employ office/admin staff who can host and operate the service. This type of public private (community) partnership enables services which have high capital but low operating costs to be established. This is only effective where staff input is limited to managing the service and no driver costs are incurred.

Partnership with private sector organisations is suitable in the case of bikes or e-bikes being supplied to be hired from commercial bike shops. This form of partnership is most suited to rural areas where little to no competition exists and where commercially viable bike hire service delivery would not be possible without the partnership arrangement. This is providing collective asset sharing as a non-profit add-on to existing commercial operations.

This type of asset sharing service is suitable for short term hourly hire as well as longer term hire of several weeks. Short duration hires are best for connection and leisure use and non-essential trips. Longer term hires can help young people or unemployed access job or training opportunities.

Financing: For bike and e-bike sharing schemes, in cases where no competition exists and demand for the service is not commercially viable as a standalone service, partnerships with selected private sector enterprises can dramatically reduce cost of provision. Public private partnership funding is required where the public sector purchases the bikes and supplies these to the private sector company to deliver the service for less cost than the public sector can do on its own. The private sector bike shop subsumes the operating cost of the bike hire within their existing premises and staff costs and only receive public sector payments to cover bike/vehicle maintenance costs. Their motivation is to increase the number of people cycling, who may then go on to purchase their own bike from the shop. The users of the hire service may also purchase cycle accessories from the shop.

Target User Groups: tourists and young people/students, job-seekers, although e-bikes enable active old persons to also benefit from these schemes.

Legislative considerations: Asset sharing services that require infrastructure on the roads are subject to legislation on where and how they can be provided. It requires partnership planning and agreement with the public-sector departments responsible for highways. Issues related to dock-less bike and scooter sharing schemes, where no legislation exists, and authorities have no power to licence and regulate their use, can create problems in urban areas but do not exist in rural or peri-urban areas.

In rural and peri-urban areas state aid rules[9] place limitations on the operators and operation of these services when public sector funding is used to finance part of the service delivery, in this case to purchase the vehicles. The asset sharing services provided need to be non-commercial and there cannot be other competition in the area to provide the service to the target users. So, where public private partnership funding is used to pay for bikes or e-bikes and for maintenance of these, the private sector provider cannot make direct profit from the operation of the service but can profit from indirect sales of merchandise to the bike-share users.

For collective car sharing services usual driving license requirements apply. Insurance is included as a standard part of the service.

- WP3 Case Studies Reference

INCLUSION examples	Comment	User Types	Area Types
3.8 Wheels2Work	Moped brokerage; Revenues from hire charges; Sustainable operation requires sufficient members to achieve economies of scale to cover overheads and maintenance staff	Job seekers; Young people; People without driver's license	Peri-urban Rural
5.2 CarSharing Pfaffenwinkel	Funded entirely from membership and usage fees; Non-profit organisation originally coordinated by volunteer but moving to a paid manager with expansion; Cars leased	Rural residents;	Rural
WP4 CNP e-bike share scheme	Public -private partnership with local commercial bike shops to host and manage hire of e-bikes provided by public sector funds.	Young people;	Rural

---

[9] https://www.gov.uk/guidance/state-aid; https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/582049/state-aid-self-assessment.pdf

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

		People without driver's license; Active old; Tourists	
WP4 Rhien Sieg e-bike lease scheme	E-bike lease scheme for medium term hire (2-4 weeks) to young persons. Bikes funded by public sector and managed by local tourist offices.	Young people;	Peri-urban

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

BC3_Scenario 2: Asset sharing of buses where the users of the asset are organisations providing a service for members of the public

In rural areas, due to low demand, there is limited conventional public transport service provision and a lack of commercial services, resulting in a disjointed array of non-commercial community bus services operating. These tend to emerge to serve specific purposes where a gap in the conventional network is evident. This piece-meal approach results in poorly planned and poorly integrated services that are often restricted to particular trip purposes and are not designed with vulnerable users' needs in mind. Quite often they are introduced with very limited or no funding using available vehicles which are often not accessible. A different model of service delivery should be considered in rural areas.

Where it is not commercially viable or 'reasonable' for private sector providers to adapt vehicles to meet equality legislation and where community organisations cannot afford to purchase accessible vehicles, the public sector should consider providing grant funding to purchase or lease a 'pool' of high specification accessible vehicles of suitable size for the areas they serve to ensure the needs of vulnerable users are met. These should be provided under an asset sharing model for use by local community organisations.

Delivery mechanism: Using public sector funding to purchase a pool of accessible vehicles of varying sizes for the local community to use on an asset sharing basis. The vehicles could range in size from 8 seaters (the preferred choice for part of the vehicle pool as they do not require special license to drive) up to 16 seat minibuses.

The primary purpose would be to enable community transport groups in rural areas to build up a core network of fully-accessible flexible public minibus services driven by professional drivers (see *BC5_S2: Not-for-profit collective transport services that better meet vulnerable user demands in rural areas*).

However, it also opens up the opportunity for not-for-profit organisations such as community transport groups, charities and social enterprise companies to utilise accessible vehicles as and when they need them for their clients. E.g. the use of smaller accessible vehicles by volunteers for one-off trips where volunteer car schemes require an accessible vehicle to meet needs of physically disabled persons who cannot use a standard private car; or the use of larger accessible vehicles for social service client group travel such as lunch clubs. The vehicles would also be suitable for meeting many health and education sector client travel needs.

Managing the shared vehicle pool requires staff time and resource for manging the hires, maintaining cleanliness and roadworthiness of the vehicles as well as providing safe spaces to park the vehicles. Community transport organisations are well placed to provide this service at low cost as an addition to their existing operations. As these groups are likely to be one of the heaviest users of the vehicles this is a sensible option.

Financing: Having a fleet of accessible vehicles available for community groups can reduce the need for the public sector to provide expensive specialised door-to-door services potentially allowing diversion of some public-sector funding from these more expensive services.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

Other public-sector partners in health, education or social services have the opportunity to utilise the door-to-door accessible vehicles pool to meet their clients' needs. If this is a possibility, then their requirements and likely demands should be discussed at the planning stages to attract their co-financing of the vehicle purchase.

Target User Groups: All rural dwellers, especially physically disabled; elderly; families with young children (in buggies)

Legislative considerations: Due to 'state aid' rules[10], where public-sector grant funding is used for vehicle purchase, then those vehicles can only be used to operate on non-commercial services and where there is no other competition in the area to provide the service to the target users. This restricts their use by private sector providers and limits their use to community sector, charities and social enterprise organisations. This approach helps rural areas to meet equality legislation requiring all bus, rail and taxi vehicles to be accessible to disabled persons with a range of impairments by 2020.

If the vehicles are to be used by volunteer drivers, it is unlikely they will have qualified to drive minibus vehicles with over 9 passenger seats. As a result, part of the pool of shared asset accessible vehicles should have 8 or fewer passenger seats.

- WP3 Case Studies Reference

INCLUSION examples	Comment	User Types	Area Types
4.8 Wensbus ("Wish bus") Limburg	Volunteer car or minibus (8 seat) service using a mix of volunteer cars or community owned vehicles; Grant funding + user fares supports operations; Grant funding also available for vehicle purchase; Replaces service contract routes	Elderly; People without driver's license	Rural
4.7 Mobuur neighbourhood service	Volunteer car service; Grant funding + member fees supports operations; Vehicles purchased and leased by public sector	Elderly; Disabled; People without driver's license	Peri-urban
5.1 AVIRA wheelchair-accessible car sharing	Organisations with wheelchair accessible cars share these with those seeking them; Utilises volunteer drivers; Uses matching software to link passengers with drivers and accessible vehicles; Grant funding pays for scheme set-up /management and by social enterprise organisation.	Physically disabled;	Peri-urban Rural

---

[10] https://www.gov.uk/guidance/state-aid
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/582049/state-aid-self-assessment.pdf

BC4_Scenario 1: Public-private partnership ridesharing services using shared taxis

Delivery mechanism: Establish public private partnerships with taxi providers or other commercial ride-sourcing operators (e.g. Uber) to secure services offering first and last mile connections at affordable fares to support integration with the mainline public transport network. This form of partnership is most suited to areas where little to no competition exists and where commercially viable service delivery would not be possible without the partnership arrangement. This could include late night/early morning services in deprived urban areas.

This is most appropriate in deprived urban and peri-urban areas where it is often too far to walk to public transport stops, or where there are perceived safety issues with walking or waiting in certain areas or at certain times of day. In rural areas the length of first and last mile connecting journeys (and hence cost to the passengers) and limited supply of private sector ridesharing providers make this a less suitable approach.

Financing: Public private partnerships comprise the joint delivery of services between the public and private sector to improve efficiency and cost effectiveness for specific services delivery. It can be used to ensure that private sector providers tailor their services for vulnerable user groups or to extend commercial services into non-commercially viable prioritised areas. It can also be designed to ensure that the private sector provide services that integrate with the wider mainline PT network. In essence, the partnerships allow the public sector to ensure that the private-sector deliver non-commercial service enhancements that enable extension to wider range of vulnerable groups in the most cost-effective manner.

Target User Groups: Elderly, Disabled (all forms), Job seekers, Migrants, Low income, Women.

Legislative considerations: Direct awards to private sector providers through partnerships for enhanced service provision are limited to the threshold at which general EU procurement rules apply. That is, up to a lifetime contract value of €214,000 excluding VAT when partnership is with a local public authority[11].

In cases where no competition exists and demand for the service is not commercially viable as a standalone service, partnerships with selected private sector enterprises can dramatically reduce cost of operation. For example, partnership payments to private sector taxi companies can be designed to secure services offering first and last mile connections to support integration with the mainline public transport network.

---

[11] https://ec.europa.eu/growth/single-market/public-procurement/rules-implementation/thresholds_en

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

- WP3 Case Studies Reference

INCLUSION examples	Comment	User Types	Area Types
3.1 Public Private Partnership car and ride sharing	First mile connections; Paratransit substitute	Elderly; Disabled; Low income; People without driver's license; Commuters	Deprived Urban; Peri-urban
4.4 Formentera Taxibus	On-demand taxi-bus service; Replaces service contract bus route	Elderly; Low income; People without driver's license; Commuters	Peri-urban
3.5 T2E - Transport to Employment	Coordinated shared taxi service; Social enterprise; For trips to employment including child-care drop-off	Job seekers; Women; People without driver's license	Rural
5.11 Taxi-Scuola	Public sector contracts taxi company using 8 seat vehicles to provide school transport from villages to urban area; Partially replaces service contract infrequent bus route; Users pay bus fares.	Students	Peri-urban

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

BC4_Scenario 2: Peer-to-peer ridesharing services

Delivery mechanism: In rural areas, due to low demand there is limited conventional public transport service provision and a lack of commercial service providers. Collective and flexible non-commercial community bus services operating can be effective at providing a basic level of service (see *BC5_S2: Not-for-profit collective transport services that better meet vulnerable user demands in rural areas*) but there are still many gaps in the coverage and many trips remain unserved.

Peer-to-peer volunteer lift giving services where individuals use their own private vehicle have the potential to fill some of these gaps, delivering non-essential transport for social, shopping and leisure purposes, without public sector funding. This expands the range of transport services available for non-essential travel. These services can be small in scale, with only a few volunteers requiring little coordination and management, up to large scale schemes, with hundreds of volunteers that require substantial time input in management and coordination or rides and in attracting and retaining volunteers. Usually, larger scale schemes are managed by community transport groups using a paid manager supported by volunteer staff.

In addition to volunteer lift giving services, community peer-to-peer carpooling or lift-sharing should be facilitated and promoted for certain groups, such as peri-urban and rural commuters and school pupils. Liftshare/carpool schemes tend to be coordinated by social enterprise companies with paid staff. Often these rely on third party funding from large employers to cover staff and overhead costs and are targeted to employees/commuters. Widening the potential opportunity from peer-to-peer services for vulnerable user groups is likely to require additional funding support for management, marketing, and driver awareness training.

For all peer-to-peer services, users typically pay a low reimbursement per km to drivers to use these services. The maximum a driver can receive is limited by legislation (see below).

Financing: Public sector grant funding to be provided to community sector to provide volunteer training and to meet management costs. Operational costs of volunteer car schemes are often met by user contributions and sponsorship or donations from local businesses. The more complex the needs of vulnerable users, the more essential the requirement for a funding source to manage the service and adequately train volunteers.

Where there is a shortfall in operating costs incurred by community or social enterprise service delivery, this can be funded (or part funded) through public sector grants where services are non-commercial and there is no other competition in the area to provide the service to the target users.

Costs for carpooling schemes are often met by users of the schemes, although there may need to be some small additional costs for scheme management and marketing.

Target User Groups: All rural dwellers, elderly; physically disabled; sensory disabled; low income; commuters; people without driver's license; students; women

Legislative considerations: For peer-to-peer lift-sharing services and volunteer car services using private vehicles, the financial reimbursements to drivers is limited by legislation to ensure that private car insurance policies remain valid. This is 45p/mile in UK but varies by country.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

These services are not obliged to adhere to equality legislation. They are therefore, in most cases, not suitable for persons requiring accessible vehicles. Providing access to a community pool of accessible vehicles for volunteer drivers for trips which require this can remove this barrier (see *BC3_S3: Asset sharing of buses where the users of the asset are organisations providing a service for members of the public*). It is important that a number of the accessible vehicles in the asset sharing community pool are 8 seats or less as these do not require special licenses to drive.

- WP3 Case Studies Reference

INCLUSION examples	Comment	User Types	Area Types
5.7 ITNCountry	Community car scheme using volunteer drivers; Funded by membership and usage fees, donations and 'ride credits'; Nationwide scheme so management costs spread across wide user base; Volunteers receive training	Elderly; Sensory Disabled	Rural
5.5 GoKid Carpool app	Carpooling App based platform for parents to share lifts with other parents (whose children are at same school). Sold to schools. Monthly membership fees for parents to access platform; Technology developed with crowdfunding and venture capital	Families with children	Peri-urban Rural
4.6 GO MOBIL	Volunteer car service; Grant funding supplemented by sponsorship and member fees	Elderly; Disabled; Rural;	Rural
4.8 Wensbus ("Wish bus") Limburg	Volunteer car or minibus (8 seat) service using mix of volunteer cars or community owned vehicles; Grant funding + user fares support operations; Grant funding also available for vehicle purchase; Replaces service contract routes	Elderly; People without driver's license	Rural
5.4 Go Go Grandparent	Simplified booking system for ride-sourcing services for those without smartphone; Concept could be adapted for taxi booking	Elderly Low income	Urban

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

BC5_Scenario 2: Not-for-profit collective transport services that better meet vulnerable user demands in rural areas

The majority of collective services provided in peri-urban or rural areas are to replace poorly used conventional public transport services, or to provide a service in rural areas where no other public transport exists. Commonly these collective services form a disjointed array of demand responsive bus services. These are sometimes provided under service contract by private sector providers but are more often provided at lower cost by not-for-profit community sector providers and driven by volunteers to serve specific purposes where a gap in the conventional network is evident. As a result, they are often not designed with vulnerable users' needs in mind, do not operate with accessible vehicles and very often are restricted to particular trip purpose, time of day or destination. Vehicles can vary in size according to the demand being served but typically are small minibuses or large people carriers.

Delivery mechanism: To better meet the needs of more vulnerable users in rural and peri-urban areas, it is recommended that these collective transport services are made open to all and operate using accessible vehicles and paid drivers.

Public-sector grant funding should be used to purchase or lease a 'pool' of standardised fully-accessible vehicles, of suitable size for the areas they serve (see *BC3_S3: Asset sharing of buses where the users of the asset are organisations providing a service for members of the public*), allowing their use on a core network of flexible public bus services driven by professional drivers.

Professionalising the service and using standardised fully-accessible vehicles enables the possibility for other public-sector clients to be transported on these vehicles. This is especially beneficial where hospital or health centres and social care establishments are within the service area of the collective transport service.

Due to state aid rules (see legislation section) the pool of accessible vehicles could be made available to any organisation in the community operating on a non-commercial basis. This rules out private sector providers and so is most suited to community organisations, charities and social enterprises.

Financing: The funding of the core flexible collective services in rural/peri-urban areas could be through public-community partnerships where the community organisation supplies the driver and operation of the service, and the public sector provides the vehicle (via the community pool of vehicles – see *BC3_S3: Asset sharing of buses where the users of the asset are organisations providing a service for members of the public*), the funding for driver training, salary and running costs. Fare revenues typically only cover a fraction of the operating costs in rural areas (usually less than 25%) when paid drivers are used. Public sector funding is required for the shortfall, although this requirement could be reduced through sponsorship from local businesses that may benefit from the existence of the new service.

With a partnership arrangement, the public sector can specify minimum operating times and areas covered by the service while keeping flexibility in terms of specific stops and pick-ups. Including schools or hospitals in the areas served can reduce the need for dedicated services for education or health clients and pull in financing from these other public-sector partners to help fund the

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

service. The use of paid drivers and accessible vehicles is quite often a pre-requisite for this to apply.

Providing a core network of flexible collective services using fully-accessible vehicles and professional trained drivers can, in certain cases, replace the more expensive non-commercial fixed route service contracts with budgets being diverted to part-fund the purchase or lease of accessible vehicles or to finance the partnership agreement for service operation. This core network of flexible services will also reduce the need for specialised door-to-door service provision, potentially allowing diversion of some public-sector funding from these more expensive services.

Target User Groups: All rural dwellers, especially physically disabled; elderly; sensory disabled; families with young children; women

Legislative considerations: If public-sector financed accessible vehicles are to be used on the collective transport service then, due to 'state aid' rules[12], those vehicles can only operate on non-commercial services and where there is no other competition in the area to provide the service to the target users. This limits their use to community sector, charities and social enterprise organisations. This approach helps rural areas to meet equality legislation requiring all bus, rail and taxi vehicles to be accessible to disabled persons with a range of impairments by 2020.

- WP3 Case Studies Reference

INCLUSION examples	Comment	User Types	Area Types
4.2 De Bij Bus	Community bus; Volunteer driver; 8 Seats; 88% Funding from private sponsors, donations and member fees (remainder is grant funding which covers vehicle depreciation)	Elderly; Disabled; Rural; Persons with mild cognitive impairment	Peri-urban
4.1 Bürgerbuses in NRW	Community bus; Volunteer driver; 8 Seats Grant funded	Elderly; Disabled; Rural	Rural Peri-urban
4.8 Wensbus ("Wish bus") Limburg	Volunteer car or minibus (8 seat) service using mix of volunteer cars or community owned vehicles; Grant funding + user fares supports operations; Grant funding also available for vehicle purchase; Replaces service contract routes	Elderly; People without driver's license	Rural

---

[12] https://www.gov.uk/guidance/state-aid
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/582049/state-aid-self-assessment.pdf

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

5.6 Haltetaxi Zeeland	Grant funded feeder ridesharing service using minibus operated by taxi association; Pickups from bus stops; Bus fare for users; Assistance cards carried by users; Replaces withdrawn service contract routes	All	Peri-urban

BC6_S1: New forms of subsidised travel through MaaS systems

Delivery mechanism: Personalised mobility budgets effectively give qualifying vulnerable users money to spend on their transport needs and places choice of transport type and operator into the hands of the user. In principal, all other travel discounts are removed for these users and they are charged the standard fare/market rate to use their choice of transport service.

The personalised mobility budgets would be delivered through a MaaS system. MaaS systems require a technology platform that integrates data on availability, timings, routes, cost of use and ticketing for all transport services. To maximise choice, and especially in rural areas these need to not only include the conventional public transport services and taxis, but also flexible collective public bus services (see *BC5_S1: Commercially viable collective transport services that better meet vulnerable user demands* **;** *BC5_S2: Not-for-profit collective transport services that better meet vulnerable user demands in rural areas*), shared taxi services (*BC4_S1: Private sector ridesharing services using shared taxis*), volunteer car service and perhaps peer-to-peer lift sharing offers (*BC4_S2: Peer-to-peer ridesharing services*).

Importantly, the MaaS system would need to contain tailored information on types of vehicles and driver profiles to allow vulnerable users to find options that match their specific needs. In addition, other asset sharing services not involving drivers, such as car share, bikeshare, e-bike hire and moped hire services (*BC3_S1: Asset sharing in urban areas where the users of the asset are individual members of the public ; BC3_S2: Asset sharing in rural or peri-urban areas where the users of the asset are individual members of the public*), should also be integrated in the available options.

A subscription payment approach would allow individuals to pre-select a mixture of transport services, with a monthly km-allowance for each service to form a package; the monthly subscription being based on the distance purchased for each mode of travel (Taxi-km being more expensive than bus-km which would be more expensive than volunteer car-km etc…). The alternative to this is a pay-as-you go approach, whereby users select their mode of travel as and when needed, based on what is available at the time, and pay the km-rate for the selected mode. From a funders point of view there are two ways of providing this: 1) a pre-paid package could be provided, which allows the funders to choose the transport options to include in the package and the discounted rate offered for each to the user; or 2) qualifying vulnerable users are simply provided with a monthly personal mobility budget to spend on their travel needs as they choose. This reflects continuing moves in certain countries towards personalised budgets in social care, in place of centrally organised service provision. Mobility budgets awarded to target users are also being explored in other sectors such as employment and health, especially where cost is a significant barrier to access.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

Financing: Under this funding approach, other public-sector partners have the opportunity to directly fund their clients through personalised budgets. E.g. social care providing personalised budgets to their clients rather than having involvement in centrally organised service provision. The clients then decide how to spend their budget between all their social care needs, such as home help, meals on wheels, day centre payments etc. as well as paying for transport services for social and health trips. Qualifying users are credited with their personalised mobility budget by their public-sector provider and can top up their budgets using their own income. This potentially opens up funding opportunities from a wide range of public sector partners.

The development of the MaaS platform in which the personal mobility budgets would be deployed could attract venture capital investment and be developed by private sector technology companies. Delivery could also be commercially viable with the private sector organisation receiving a cut of the monthly subscription payments from users where demand is high enough. However, it is likely that deployment would require additional investment from the public sector in rural areas and to ensure that the platform is adapted to the additional needs of vulnerable users. If this is the case, public-private partnership funding and agreements with the technology developers would be required.

Target User Groups: Elderly, Disabled (all forms), Children, Job seekers, Migrants, Low income.

Legislative considerations: The MaaS platform involves data sharing between public sector and private sector partners. The General Data Protection Regulation (*679/2016/EU*) (GDPR) must be adhered to when sharing and processing data relating to an individual's personal information, trips and financial information when monitoring and managing user's subscriptions and accounts.

Financial reimbursements to drivers for volunteer car schemes and peer-to-peer lift-sharing services is limited by legislation. This is 45p/mile in UK but varies by country. Typically, if this is adhered to then private car insurance policies remain valid. Any trips by volunteer car drivers or peer to peer lift share that qualify for reimbursements would need to be made to the community organisation or social enterprise provider managing the service and not the drivers if this rate is exceeded.

- WP3 Case Studies Reference

INCLUSION examples	Comment	User Types	Area Types
WP4 CNP – Feasibility study for MaaS platform	MaaS platform study examining the possibilities and potential for a MaaS solution in rural areas	Rural	Rural

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

BC7_Scenario 1: providing staff awareness training to increase confidence and safety in using public transport services

Delivery mechanism: Staff awareness training on understanding vulnerable users' needs and capabilities should be included as mandatory elements in service contracts, where these exist. Awareness training should be provided to all staff who come into contact with vulnerable users during their journey, from ticket sales staff, to drivers, inspectors and customer service staff.

Better staff awareness and improved attitudes towards vulnerable users helps remove confidence barriers that prevent vulnerable users utilising conventional Public Transport services. Better trained staff can also lead to improved safety and feelings of security while travelling, which is of particular relevance to women and elderly passengers. Staff awareness training further helps ensure staff know the appropriate actions to take when serving a vulnerable user, such as giving extra time for boarding including securing wheelchairs/sitting and alighting for vulnerable passengers in wheelchairs or with mobility difficulties. This improved level of service may also remove the need for certain specialist client transport services for health or social service clients.

Financing: Within service contracts the public sector invites tenders from private sector operators or community sector organisations to provide a specific service under contract. Private sector operators or community organisations bid to provide the specified service for an agreed contract payment. The public sector then selects an operator and awards the contract. The successful private sector operator or community organisation then operates the service according to the contract specification. Improving the ability of vulnerable users to travel on the conventional public transport network can result in fewer trips by vulnerable users on expensive specialist door-to-door services saving public sector spending which can be diverted to finance the increased service contract costs.

Target User Groups: Physically disabled; Elderly; Sensory disabled; Cognitive/mental health impairments; Migrants; Women

Legislative considerations: Under equality legislation, transport providers have a duty to make reasonable adjustments to the way vehicles are operated so that disabled people can use services. E.g. to assist a person with a mobility impairment in getting on and off a vehicle or a bus driver telling a visually impaired person when they have reached their stop.

EU Directive 2004/18/EC (Article 26) specifically allows public authorities to introduce contract performance requirements relating to social and environmental considerations provided that these are publicised in advance. It is recommended that this be used as a means to encourage transport providers to submit tender bids that include 'added value' components (e.g. staff awareness training) which address the needs of vulnerable users. Authorities can then include an assessment to weigh up and compare different kinds of social benefits (including meeting vulnerable users' needs) being offered by tenderers when awarding the contracts.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

- WP3 Case Studies Reference

INCLUSION examples	Comment	User Types	Area Types
6.1 Disability Awareness Training for Transport Operator Staff	Guidebooks and training frameworks financed by transport operator associations or advocacy groups	Elderly; Physically disabled; Sensory disabled;	Urban Deprived urban
7.5 Blue Badge / Safe Journey Card / Customer Injury Cards	Provides visible indication (by card or badge) that the wearer requires assistance due to having additional mobility requirements; Low cost solution met by providers	Elderly Physically disabled; Sensory disabled cognitive impairment Women (pregnant)	Urban Deprived urban Peri-urban Rural

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

BC7_Scenario 2: Providing travel assistants to enable use of public transport services

Delivery mechanism: For vulnerable users with more complex sensory disabilities and cognitive/mental health impairments, heightened awareness of user needs by staff can only go part of the way to giving these users confidence and capability to travel independently.

Those with more complex needs require personal assistance provided by trained travel buddies who accompany the vulnerable user when starting to use conventional public transport until they are confident to travel independently in a safe manner.

Travel assistants provide a larger contingent of vulnerable users with the opportunity to transfer from limited and expensive-to-procure specialist door-to-door services to conventional public transport, resulting in more choice and greater freedoms for vulnerable users as well as reduction in public spending on specialist services.

Financing: Empowering vulnerable users to travel independently reduces demand for specialist door-to-door services saving public sector spending. These savings can be diverted to fund public-private partnership payments that can be used to train and pay for travel assistants.

Target User Groups: Physically disabled; Elderly; Sensory disabled; Cognitive/mental health impairments

Legislative considerations: Whenever individuals are working directly with vulnerable users such as children and protected adults, there is a need for thorough vetting to ensure people whose behaviour makes them unsuitable to work with children and protected adults cannot do 'regulated work' with these vulnerable groups. Different countries have their own legislation which needs to be adhered to as well as approved membership schemes relating to this for paid travel assistants.

- WP3 Case Studies Reference

INCLUSION examples	Comment	User Types	Area Types
6.4 Travel Buddy	Independent travel training and travel support to adults with a physical disability or mental health difficulty; Support provided by other adults with disabilities – fully trained and paid	Physically Disabled Sensory disabled Cognitive disability/mental health	Urban
6.2 Donostia - public transport for over 60s	Over 60's given training on how to use PT services; Workshops funded by public sector and delivered by community or private sector organisations	Elderly	Urban
6.3 Manchester - travel training	One-to-one teaching/mentoring of safe independent PT use to young persons with special education needs and disabilities; Uses paid training staff; Focus on social value generated; Long term reduction in costly specialist door-to-door travel	Young persons with mild cognitive impairment	Urban Peri-urban

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

BC8_Scenario 1: Tailored information (visual or audio) to raise awareness of options available or provide journey assistance

Delivery mechanism: This involves provision of easy to understand information in the form of printed leaflets, maps, or signage at stops/stations and on-vehicles. It also includes providing audio messages at stops/stations and in vehicles to assist those with reading or sight impairments. Audio messages in multiple languages can also assist those that are not native language speakers. In most cases these are relatively simple and cheap interventions to produce but require detailed knowledge of vulnerable user requirements and the best way to communicate messages to the target groups. Co-participation workshops involving vulnerable users, transport providers and transport authorities should be held to fully understand the information needs and capabilities of users.

Financing: Private sector transport providers should ensure that information about their services is produced in formats that are understandable by all users and should contain information necessary for users with specific needs to be able to make use of the service. Where information relates to signage at stops or stations where the transport authority has responsibility then funding the improved or additional information that is needed should come from the public sector. The costs for this are low. In the case of audio-visual (AV) information on-board buses, private sector providers may require incentives from the public sector to introduce AV equipment that can provide tailored messages to vulnerable user groups. The public sector should also fund the co-design workshops that are necessary to fully understand the needs of different vulnerable users in order that the most suitable information provision can be produced.

Target User Groups: Tailored information can benefit all vulnerable user groups but in particular: sensory disabled; elderly; physically disabled, migrants.

Legislative considerations: Under equality legislation, transport providers have a duty to make reasonable adjustments to the way vehicles are operated so that disabled people can use services. However, there is nothing specific to providing information in the legislation. Some EU states are in the process of conducting consultations on provision of accessible information for bus and/or public transport services (e.g.: https://www.gov.uk/government/consultations/bus-services-act-2017-accessible-information).

- WP3 Case Studies Reference

INCLUSION examples	Comment	User Types	Area Types
7.11 Showing the way in Toulouse using pictograms	Low cost system of signage using pictures at stations; symbols give a visual representation of a concept linked to the name of the station; accompanying journey planning app incorporating the pictures	Cognitive disability Migrants Children	Urban

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115

BC8_Scenario 2: Tailored mobile applications to reduce information barriers thereby increasing uptake and usability

Delivery mechanism: This requires development of technology solutions that are specifically designed with attention to the needs of vulnerable user groups. These technology solutions are typically developed by private sector technology companies. Although there are some circumstances where they can be delivered on a fully commercial basis through user charges/subscriptions, in general, public private partnerships offer the best means of delivering these. Within the partnership, the public-sector shares data on services and user requirements and the private sector developers build and deliver the services to users for a fee paid by the public sector.

The types of applicable technology solutions are broadly of two forms: The first consists of enhancements to existing journey planning apps and travel information tools to ensure the content they provide is useful and understandable by vulnerable users. This means including data on accessible vehicles, and accessible routes in stops and stations; ensuring intermodal journey information with real time updates is available in rural areas where connections are necessary between flexible collective and shared ride services and the infrequent conventional public transport services; and providing content in languages and using icons and pictograms instead of long text for non-native speakers, etc. The second type of technology solution are tailored travel information apps, which also connect to virtual travel assistants who offer support and guidance to vulnerable users while travelling via the technology apps/services. These are designed for users with more complex travel needs such as sensory disability or some mild cognitive impairments.

Financing: Private sector developers use venture capital investments to initiate technology solutions, which are delivered commercially via user payments/subscriptions or more often through public private partnership funding.

These technologies support more independent travel, providing a larger contingent of vulnerable users with the opportunity to transfer from limited and expensive-to-procure specialist door-to-door services to conventional public transport, reducing demand for specialist door-to-door services and saving public sector spending. These savings can be diverted to fund the public private partnership payments needed to deliver technology assistance apps to vulnerable users.

Enhanced information provision through technology solutions may also empower some social service and health sector clients to discover conventional public transport services they can use, enabling transfer from more expensive dedicated provision to inclusive conventional public transport services.

Target User Groups: Technology providing tailored information can benefit all vulnerable user groups but in particular: sensory disabled; elderly; physically disabled, migrants; women.

- WP3 Case Studies Reference

INCLUSION examples	Comment	User Types	Area Types
7.1 Aira app	Technology solution using wearable smart glasses providing guidance and remote assistance (connecting to human agent) to blind persons; Venture capital funding; Monthly subscription fees for users sufficient for commercial operation	Sensory disabled;	Urban
7.4 Be My Eyes app	Free to use app that connects blind users to a network of sighted volunteers; uses videoconferencing technology; uses gamification rewards to volunteers; developed with crowdfunding and donations	Sensory disabled	Urban Deprived urban Peri-urban Rural
7.13 Wher app	City map app allowing women and LGBTQ+ users to review and share travel options and their safety; Developed through sponsorship; Long term funding through private sector sponsors and user subscriptions; uses open and crowdsourced data	Women	Urban
7.3 Barrier-free digital journey planner and travel assistance for disabled and elderly in Berlin	Public sector funded. Also requires suitable data maintenance programme involving PT operators + city authorities to feed the planner	Physically Disabled Elderly	Urban
7.2 APP&Town Compagnon	Multimodal journey planner customised to each user's capabilities; Supported by tutor; Requires well developed PT network. Funded through public private partnership	Mild cognitive impairment; Physically disabled; Sensory disabled	Urban
7.9 Route4U	Rote guidance App for wheelchair, pram and bikes; Development funding by private sector investments; Utilises crowdsourced information on barriers/obstacles; Partner with cities. Public private partnership covers operational costs	Physically disabled; Families with young children	Urban

Appendix B – List of Social and Demographic factors

Social Factors	Demographic Factors
• Ability to understand information • Ability to use technology • Ability to communicate • Ability to pay • Willingness to change habits • Attitudes and cultural acceptance • Lack of trust/confidence • Lack of social interaction • Lack of social networks • Lack of empathy / understanding of other people's needs • Lack of ICT infrastructure • Feeling of personal insecurity • Willingness to share • Aversion to uncertainty	• Age • Sex • Disability • Residency status • Family status • Income level • Employment • Car ownership • Location

INCLUSION consortium

For further information

www.h2020-inclusion.eu

@H2020_INCLUSION
#H2020INCLUSION

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 770115