

INCLUSION Project

Deliverable 5.4

Full evaluation:

The reference scenarios

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Glossary

- ❖ AMB - Barcelona Metropolitan Area
- ❖ BMR - Barcelona Metropolitan Region
- ❖ CNP - Cairngorms National Park
- ❖ ICT - Information and Communication Technology
- ❖ INCLUSION - Towards more accessible and inclusive mobility solutions for European prioritised areas
- ❖ KPI - Key Performance Indicator
- ❖ LMS - Less Mobile Stations
- ❖ MaaS - Mobility as a Service
- ❖ NGO – Non-Governmental Organisation (non-profit organization that operates independently of any government)
- ❖ PA - Prioritised Area
- ❖ PL - Pilot Lab
- ❖ PT - Public Transport
- ❖ SMART - Specific, Measurable, Attainable, Relevant and Timely
- ❖ UNIABDN - University of Aberdeen
- ❖ VRS - Verkehrsverbund Rhein-Sieg
- ❖ VU - Vulnerable User
- ❖ WP - Work Package

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 will be 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 will undertake a quantitative assessment of the impacts and a qualitative process evaluation of the innovative transport solutions implemented in the INCLUSION pilot sites. Deliverables D5.1-Impact Evaluation Plan and D5.2-Process Evaluation Plan provide guidance to the pilot sites on the tasks and timings involved in the evaluation of the measures being demonstrated. This Deliverable, D5.4, presents the ‘Reference Scenarios’ which detail baseline situations before the INCLUSION measures have been introduced in each of the Pilot Labs.

The deliverable structure presents a separate chapter for each pilot lab, providing an overview of the measures being demonstrated within WP4 and subject to impact evaluation within WP5. For each of these measures, the specific objectives and associated key performance indicators (KPIs) are defined and, for KPIs where ‘before’ data is relevant, the data collection sources, methods and timings are described and the ‘before’ data values are presented. This is followed by a discussion on validity of the data (e.g. sample size, relevance of data to target group, issues with data collection / completeness) and considerations for ‘after’ data collection (sources / methods). This includes highlighting issues relating to timings of demonstration periods and the impact of this on ‘before’ / ‘after’ data collection.

2 Introduction to the INCLUSION evaluation

The main objective of the INCLUSION project is 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), to ensure accessible, inclusive and equitable conditions for all and especially vulnerable user categories. The project will address this objective through a series of Work Packages (WP) as illustrated in Figure 1: WP interrelations. WP1 involves investigating the current conditions across a representative set of European prioritised areas, understanding the relevant needs of various vulnerable user and social groups, while WP2 assesses 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 is developing 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 will 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 will be 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, provide direct access to a variety of different transport environments, socio-economic contexts, cultural and geographical conditions. WP5 will undertake a quantitative assessment of the impacts and a qualitative process evaluation of the innovative transport solutions implemented in the INCLUSION pilot sites. WP6 will frame the lessons learnt and derive 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 case studies' investigation and innovation experiments will be 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

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).

EU member states. WP7 aims also to raise awareness, promote and disseminate the project results for the take-up of accessible transport solutions across Europe and beyond.

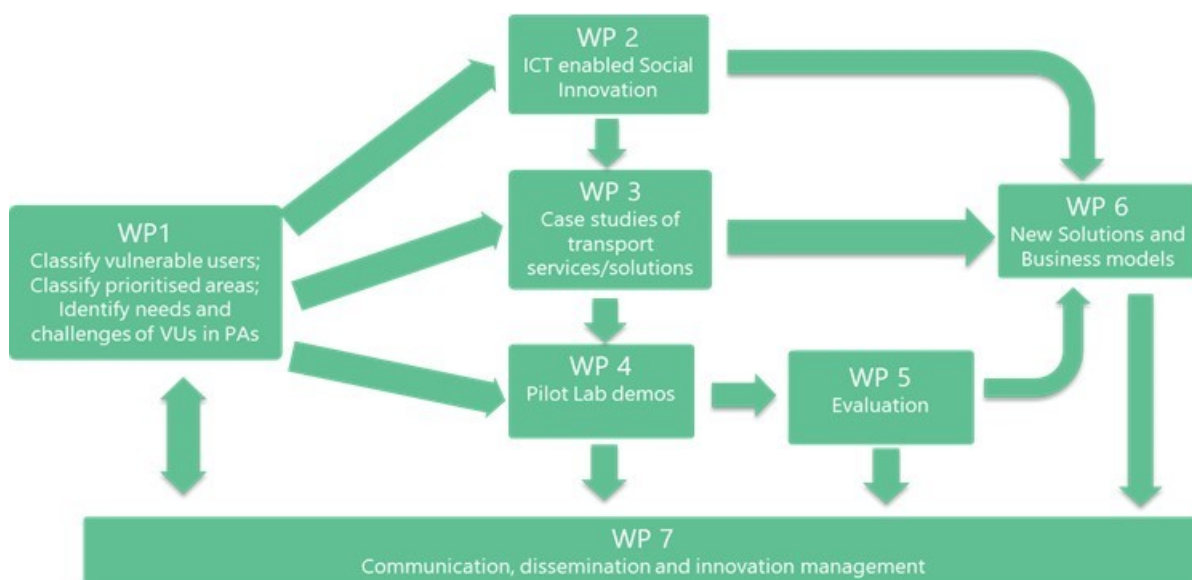


Figure 1: WP interrelations

WP5 defines a common evaluation methodology to assess the results and achievements of the INCLUSION Pilot Lab (PL) demonstrations (WP4), co-ordinates the collection of data and information on the measures in the different PLs and performs a quantitative assessment of the impacts of the different innovations implemented in the PLs and a qualitative evaluation of the processes related to their implementation.

More specifically, WP5 is aimed at:

- Co-ordinating a common procedure based on existing best practice to collect and manage data across the PLs, analyse the data and achieve unambiguous and comparable results.
- Providing an independent assessment of such outcomes both at a local level and across the different PLs.
- Assessing the transferability at the European level of the innovations tested and validated in the PLs.

The Evaluation procedure adopted in the project is two-pronged, since it includes the assessment of both results and outcomes (*Impact Evaluation*) and that of the process of planning and implementation (*Process Evaluation*) of the measures within the PLs. The integrated interpretation of results from both assessments will provide the necessary understanding of the effectiveness of the INCLUSION measures.

Impact Evaluation

The aim of impact evaluation is to provide a clear, methodical approach for quantifying (through quantitative and qualitative analytical methods) the direct and indirect impacts of individual measures (introduced in the PL areas in WP4). For this to be possible, it is critical that measurable impact objectives be clearly defined. Figure 2 describes an approach to impact evaluation that can be applied for each measure. The full and detailed approach to the impact evaluation is presented in D5.1 Impact Evaluation Plan.

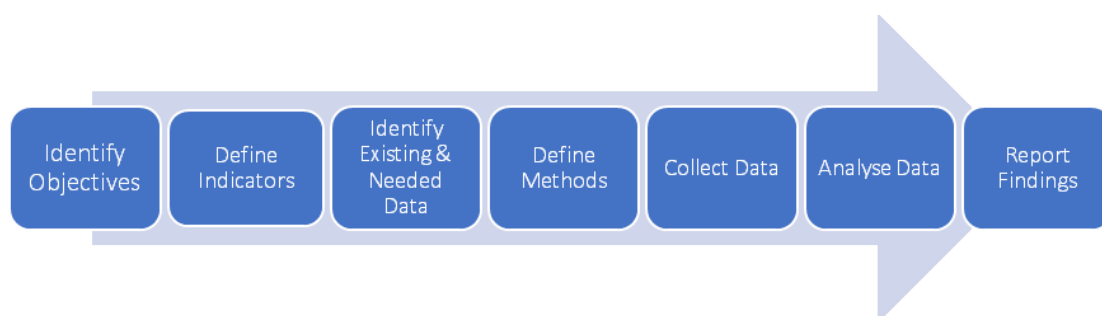


Figure 2: Approach to Impact Evaluation

Process Evaluation

Process evaluation involves the evaluation of the processes of preparation, implementation and operation of measures, including the roles of information, communication and participation. It aims to understand the mechanisms, barriers, drivers, actors and context conditions surrounding the design and implementation of each intervention and their influence on the measured impact. It will also establish if there are factors external to INCLUSION, which have had an influence on the measured impacts, or if there are any unexpected consequences/impacts generated by the INCLUSION interventions. This requires continuous engagement and consultation with key stakeholders at both pilot site level and measure/intervention level. The D5.2 'Process Evaluation Plan' provides guidance on establishing the key stakeholders, along with advice on the timings and engagement methods (e.g. online surveys, semi-structured interviews, interactive drawing exercises, focus groups) to elicit the necessary process evaluation information. Findings from the process evaluation activity will be key to identifying the potential transferability of measures beyond a specific PL where a particular measure is implemented, as well as providing insight for further policy initiatives.

The main partners involved in the evaluation activities are illustrated in Figure 3. University of Aberdeen (UNIABDN) lead the Work Package and are also the leaders of the impact evaluation tasks. RUPPRECHT oversee the process evaluation. Each of the six PLs has a designated local evaluation coordinator, as identified in Figure 3, who is responsible for local data collection, survey design and delivery, stakeholder engagement, interviews and hosting focus groups. The local coordinators will be assisted in designing and developing survey and interview materials to

support these activities by the following support partners: UNIABDN will support HITRANS in the Cairngorm PL; BUSUP will support MOSAIC in the Barcelona PL; MEMEX will support BUSIT in the Florence PL; RUPPRECHT will support VRS in the Rhein-Sieg PL. Two sites, Flanders and Budapest, do not have a designated support partner but will be offered support where needed from UNIABDN and RUPPRECHT.

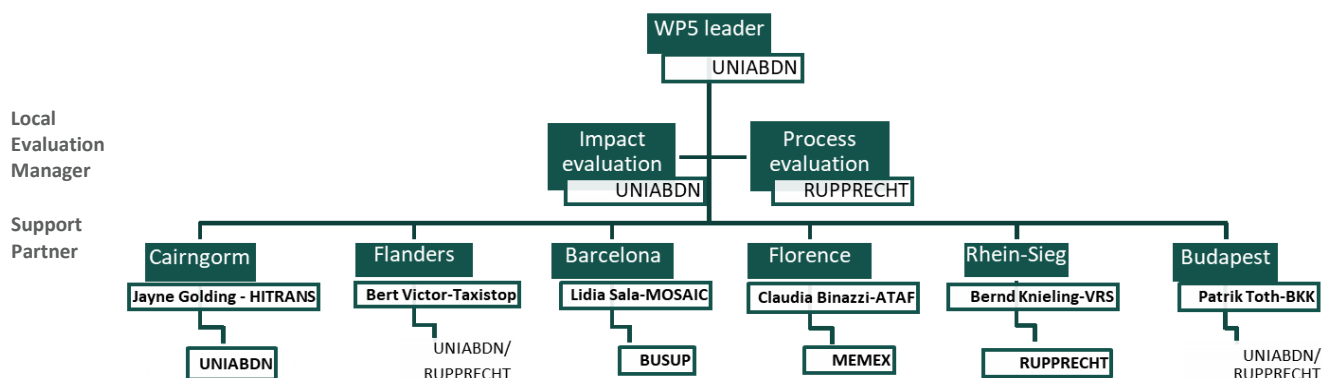


Figure 3: Roles of project partners in the evaluation

Figure 4 illustrates the timings for the main evaluation activities and the reporting requirements (Deliverables) related to these. As shown, the impact evaluation plan (D5.1) was completed in November 2018. This document provides the guidance which Pilot Lab evaluation coordinators have followed in identifying and collecting the data necessary to conduct the impact evaluation for each of the measures being demonstrated.

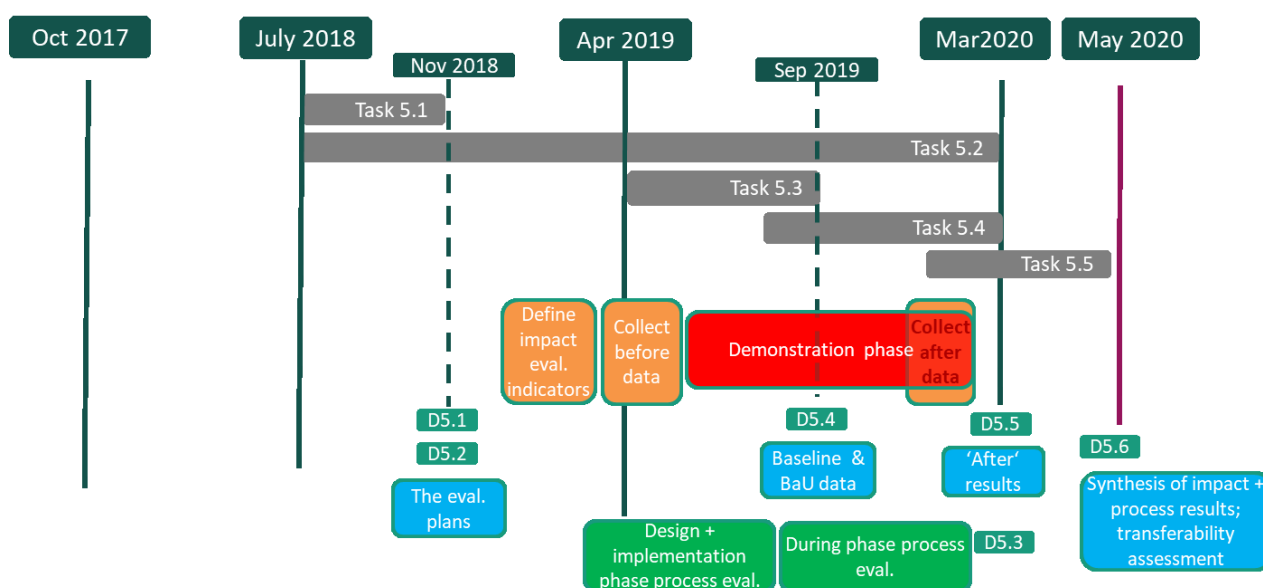


Figure 4: Timings of main activities in the evaluation

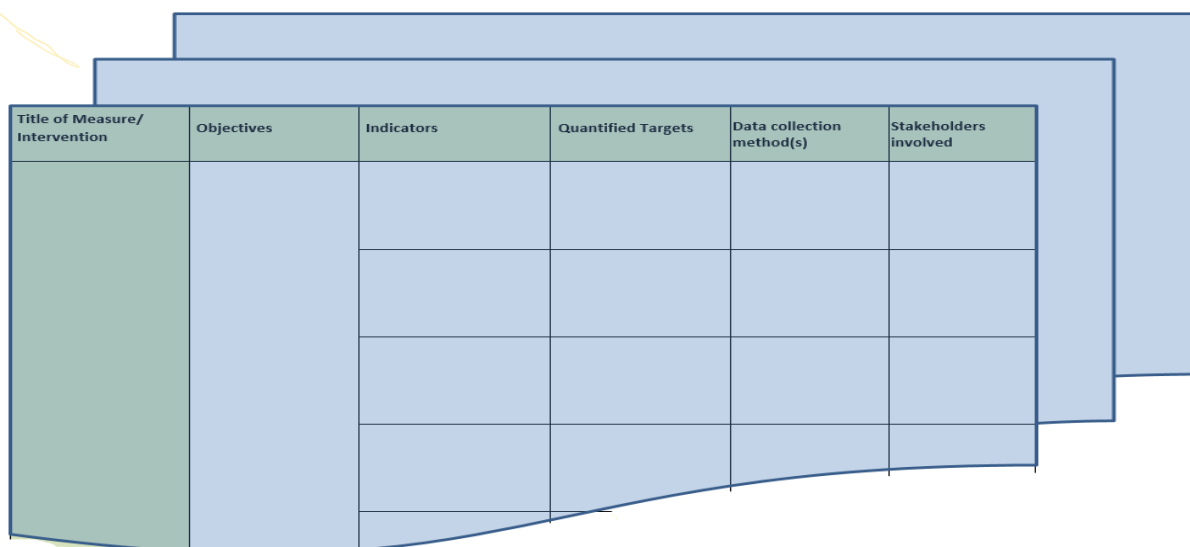
The remainder of this Deliverable details the key impact evaluation indicators (KPIs) for each measure being demonstrated and the values for these KPIs 'before' the INCLUSION measure demonstrations are launched / become active.

3 Methodology for identifying and collecting the impact evaluation data

The Impact Evaluation Plan (D5.1) defines the impact evaluation framework for PL partners to follow in order to collect the data necessary to conduct a meaningful evaluation of each measure/intervention being demonstrated. This framework helps PL partners to clearly define the objectives for each measure and to identify suitable corresponding indicators that allow measurement of the outputs and evaluation of the outcomes.

The framework consists of a set of tables for each measure/intervention that is to be introduced. A separate table is required for each measure/intervention. Illustration of the table template is provided in Figure 5. More detailed information regarding the methodology, definitions and guidance for completing these tables is provided in Section 5.2 of D5.1-*Impact Evaluation Plan*. The basic framework consists, for each measure, of:

- the objective(s) associated with its introduction
- related key performance indicators (KPIs) associated with outcomes and outputs
- the target values related to each outcome or output performance indicator
- the intended method of data collection
- the stakeholders involved in the data collection/provision



The illustration shows a 3D perspective of a table template. The table has six columns: 'Title of Measure/ Intervention', 'Objectives', 'Indicators', 'Quantified Targets', 'Data collection method(s)', and 'Stakeholders involved'. The 'Indicators' column is divided into five rows, while the other columns are single rows. The table is shown in a light blue color with a green header.

Title of Measure/ Intervention	Objectives	Indicators	Quantified Targets	Data collection method(s)	Stakeholders involved

Figure 5: Illustration of the impact evaluation framework table template

In January 2019 (M16) all PL sites were provided with a set of empty impact evaluation framework tables (one table to be completed for each objective associated with each measure/intervention) and detailed guidance on how to define measure objectives and identify suitable outcome and output KPIs (following the SMART guidance included in Section 5.2 of D5.1-Impact Evaluation Plan). An initial set of measure specific impact evaluation tables were completed by the end of March 2019 (M18) following several iterations of feedback from UNIABDN and improvement by PL evaluation coordinators. It was necessary that these initial tables defining objectives, indicators, targets and data collection methods were kept under review as the pilot sites obtained a more concrete picture of exactly which measures will be introduced in the demonstration phase of the project. Final versions of the impact evaluation tables were produced by May 2019 (M20) for all measures.

Having identified the set of KPIs for each measure, the next step was for the PL evaluation coordinators to identify the 'before' data required, how the data can be obtained, and timings for data collection. It should be noted that not all KPIs require collection of 'before' data. For instance, if the measure being introduced is a completely new service then there can be no 'before' data collection with users of the service. There will, however, be the need for both before and after data collection relating to outcome indicators with the wider target group (i.e. non-service users). Furthermore, for both new services and enhancements to existing services, KPIs relating to output indicators are often only appropriate at the 'after' stage. The general guidance on the timings and types of data required is as follows:

- If measure is an enhancement / modification to an existing service
 - Before + After surveys (users of existing services)
 - Before + After surveys with wider target group (non-service users)

- Before + After surveys with other actors (employees (e.g. BKK), volunteer drivers (e.g. Mobitwin), service providers e.g. BusUp)
- Before and After direct data on usage from IT platforms/Apps/tickets/tracking
- Before and After data reported to IT platforms/Apps through user feedback
- If measure is a completely new service
 - After surveys (users of new services – including retrospective questions on how user made trip before new service)
 - After direct data on usage from IT platforms/Apps/tickets
 - After data reported to IT platforms/Apps through user feedback
 - Before + After surveys with wider target group (non-service users)

In April/May 2019 all PL evaluation coordinators were tasked with reviewing their KPIs for each measure and identifying which KPIs required collection of 'before' data. Following this, they reported on the data collection status for these 'before' data KPIs, identifying where indicator data was already collected and suitable/sufficient. Where 'before' data was not yet collected, PLs were required to indicate how this missing data would be collected, the actors involved, the design of data collection surveys and the timings for completion of surveys / other data collection methods. The final data collection surveys were completed by mid-July 2019.

Note that although the KPIs specifically relate to each measure objective, there are a number of key indicators which broadly apply across measures at each Pilot Lab and which address the common INCLUSION project objective to *"Ensure accessible, inclusive and equitable conditions for all and especially vulnerable user categories"*. These common indicators relate to:

- Change in no. of uses / trips by target groups
- Change in no. of users from target groups
- Increase in access to services and activities (e.g. PT network / Social and Leisure activities / Work locations)
- Change in satisfaction with access to services and activities (e.g. PT network / Social and Leisure activities / Work locations)
- Change in satisfaction with services and/or information on services

These common indicators also answer the quantitative targets at the project level, as defined in Section 2 of the Description of Action, which relate to the impact evaluation. These targets associated with improved accessibility offered by public transport systems, are:

- 25% increase in number of trips involving transport connections to the PT network by target users at pilot lab sites (for measures where connected journeys are a desired outcome by users)
- Increase type of transport services feeding the PT network at pilot site

- 40% increase in satisfaction with access to key services / opportunities for vulnerable users (at pilot site)
- 25% increase in number of trips made using PT (conventional or alternative PT) services by vulnerable users

The impacts from the measures described in the following sections will be evaluated against these target impacts in *D5.5-Full Evaluation, the test results*.

In the following 6 chapters, each PL has a dedicated chapter structured as follows:

- introduction to the PL area,
- description of the INCLUSION measures to be demonstrated within WP4 and subject to impact evaluation in WP5,
- presentation of the impact evaluation tables including 'before' data values; the 'before' data includes the source of the data, the values of the 'before' data (the value for the indicator 'before' the measure becomes active) and any comment relevant to understand or explain the data,
- a discussion on validity of the data containing any other information which may help explain or understand the 'data values' and the context in which they are collected. For example, sample size, relevance of data to target group, issues with data collection / completeness. Also highlighted are issues relating to timings of demonstration periods and how this is likely to impact on the 'before' / 'after' data collection. For example, is the demo period long enough to generate awareness of new initiatives and changes in behaviour? Will seasonal factors such as weather or tourist numbers affect the results? Finally, significant issues learnt from the process evaluation which may affect the impact evaluation are also highlighted.

4 Flanders region Pilot Lab (Belgium)

The Flanders area of Belgium provides a mixture of urban, peri-urban and rural geographies. A number of issues are currently affecting transport accessibility in the area. Currently, public transport does not offer any door-to-door solution (cost-efficiency is a main issue here). This creates difficulties for many older persons to access the network. To overcome this gap in provision, Taxistop offers on-demand transport services 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.

However, there are also gaps and shortcomings associated with the LMS service - the service is restricted to people with mobility issues caused by physical problems, and time-consuming administration is needed for drivers and local dispatching.

The INCLUSION objectives for providing more accessible and equitable travel solutions in the Flanders rural and remote areas will focus on:

- 1) Increasing the efficiency of the LMS services provision by rolling out a mobile web application for the drivers, which should make it possible to organise rides without the intervention of the local municipality;
- 2) Enlarging the target group. Currently, this service is mainly dedicated to elderly people (with reduced mobility) with an income lower than twice the minimum wage. Taxistop hopes to expand the system to more people with mobility issues (such as young people, or people in poverty) and to increase the pool of volunteer drivers;
- 3) Offering a total solution to migrants seeking jobs in the PLs – adapting an existing combined Mobility as a Service (MaaS) type offer to provide more accessible travel options for migrants seeking jobs. This will involve provision of a fixed budget to be used on transport services available through the MaaS platform including carpooling, car-sharing, high capacity public transport and on-demand transport.

4.1 INCLUSION measures to be demonstrated

The focus of the Flanders Pilot Lab is to test new technologies to make two specific target groups more mobile. Deliverable *D4.5 Innovation Pilot Lab Flanders - implementation and results - intermediate version v1_0*, describes in detail the measures to be demonstrated, their design and the implementation process of the measures. It also provides more detailed description of

the characteristics of the Flanders PL. Table 1 summarises the INCLUSION measures being demonstrated and included in the impact evaluation for the Flanders PL.

Table 1 Overview of INCLUSION measures being demonstrated in Flanders PL

Measure name	Description
Develop MaaS solution tailored to (un)employed people with low income that have a migration background	Taxistop is working together with different partners (NGOs, app provider and private business) to offer a Mobility as a Service (MaaS) style mobile travel information app for (un)employed migrants with low or no income. The focus is on making the job market more inclusive and accessible for migrants for whom it is difficult to find a suitable job. This target group experiences large barriers to using transport options other than a privately-owned car. The barriers include: language; cost; or lack of knowledge about PT possibilities. This PL investigates whether the Olympus App can offer a feasible solution when applying for a job with companies that are located in areas that are difficult to reach and the jobseeker has no car of his/her own.
Deliver enhanced MobiTwin App to older, disabled and mobility impaired users	Taxistop has a Less Mobile Stations (LMS) service where it provides door to door transport for less mobile elderly people in Flanders. The members can call the station to book a trip only two days on advance. Since Taxistop wants to provide more innovative solutions for sustainable and inclusive mobility, Taxistop is organising the roll-out of the Mobitwin App in Flanders. The Mobitwin App will offer a digital version of the Less Mobile Stations service which matches trip requests for door-to-door transport (in real-time) for older persons and those with mobility impairments with trip offers from volunteer drivers. This provides more convenience for volunteer drivers and a more responsive service for passengers. Taxistop is setting up pilot projects at some 'Minder Mobielen Centrales' where both driver and member are using the app.

4.2 'Before' data impact evaluation tables

This section presents the impact evaluation tables for each of the measures identified in Section 4.1. These tables (Table 2 and Table 3) present the measure-specific objectives, define key performance indicators (KPIs) and targets relevant to the objectives, identify the data collection methods, source of the data and stakeholders involved, the values of the 'before' data and any comment relevant to understand or explain the data for each KPI.

Table 2 Impact Evaluation Table for Flanders: Deliver enhanced MobiTwin App

Title of Measure/ Intervention	Objective	Indicators	Quantified Targets	Data collection method(s)	Stakeholders involved	Source of the data	Data Values	Comments
Deliver enhanced MobiTwin App to older, disabled and mobility impaired users	Improve access to social and leisure activities for older, disabled and mobility impaired persons in Ghent and Oudenaarde	Number of trips requested by members of the target group	20 trip requests/week	Data collection of total trip requests per region in MobiTwin	Users of MobiTwin	Data collection of total trip requests per region in MobiTwin App	N/A	The data can only be collected once the App is launched
		Change in number of requested trips from the target group during/after using the app	+2% increase	Data collection of total trip requests per region before and after using MobiTwin	(Potential) Users of MobiTwin + employees of the LMS	'Before' Surveys with LMS members, volunteers and employees	Current trip requests per week (98 LMS's): 28.6% 0-20 trip requests per week/21-50 trip requests per week (39.8%)/51-100 trip requests per week (23.5%)/ >100 trip requests per week (8.2%)	The data was collected by an online survey that was sent to the members, the volunteers and the employees of the LMS. We have already 98 responses from the Services, 182 responses from volunteers and 92 responses from members. The responses from the members are coming in very slowly because a lot of them don't have an e-mail account. We are looking for ways to reach some of them offline. The surveys ask the members about current total trip requests + by asking the LMS about the total requests they get per week.
		Proportion of requested trips which are matched to a volunteer driver	75%	Data collection of total trip requests per region in MobiTwin	Employees of the LMS's + (potential) users of MobiTwin	'Before' Surveys with LMS members, volunteers and employees	Current trips matched to a volunteer driver per week (LMS's): 0-20 trips matched (35.7%)/ 21-50 trips matched (35.7%)/ 51-100 trips matched (21.4%)/ >100 trips matched per week (7.1%) Current trips matched to a volunteer driver (volunteers): Daily (9.4%)/ several times a week (64.9%)/Weekly (19.1%)/Monthly (7.4%)/exceptional to never (3.2%)	
		Number of total users from the target group	20 people	Primary data collection of users through 'before' and 'after' testing	(Potential) Users of MobiTwin	We collected before data by asking the members. e.g. "How do you prefer to request a trip from a Less Mobile Service?" and by asking the volunteers e.g, "How do you prefer to make yourself available as a volunteer driver?"	Current preferences of ways of requesting a trip (Members): By telephone (70.7%)/ By a website or app (12%)/At the LMS centre (18.5%)/By mail (12%). Current preferences for ways to make themselves available (volunteers): By telephone (26.9%)/By mail (56%)/By website or app (12.6%)/At the LMS centre (3.3%).	

		Satisfaction with app from the target group	80% of MobiTwins target users are 'satisfied' or 'very satisfied'	'Before' and 'After' surveys with target group	Wider target group		N/A	'Before' data not applicable. We can't know the satisfaction with the app before the app is presented to the target groups.
		Satisfaction with access to social and leisure activities amongst the target group		'Before' and 'After' surveys with wider target group (including non-users of MobiTwin)	Users of MobiTwin	We have collected before data by asking the members. e.g. "Thanks to the LMS, I can..."	18.5% claim to have more access to activities thanks to the LMS's/19.6% claims to go out of the house more often/19.6% claims to see their families and friends more often/18.5% claims to wherever they want, whenever they want/15.2% claims to feel more free/18.5% claims to travel faster/15.2% claims to be more flexible thanks to the LMS's/ 20.7% claims to be able to move in an economically advantageous way/ 30.4% claims to be able to use transport services in a comfortable way/45.7% claims to feel safe during a trip with the LMS/70.7% claims to be sure to reach their destination with the LMS/7.6% claims other advantages like visiting their partner at the hospital or going out at night.	The data was collected by an online survey that was sent to the members, the volunteers and the employees of the LMS. We have already 98 responses from the Services, 182 responses from volunteers and 92 responses from members.
		New trips in app	3 new trips per week	Primary data collection	Users of MobiTwin		N/A	'Before' data not applicable.

		Increased number of users from target group	Increase of 10%	Primary data collection	Users of MobiTwin	<p>'Before' Surveys with LMS members, volunteers and employees</p> <p>MEMBERS: How often do you use devices: Computer (Daily 32.6%/Several times a week 13%/Weekly 5.4%/Monthly 1.1%/Rarely to never 47.8%/// Tablet (Daily 16.3%/Several times a week 2.2%/ Weekly 2.2%/Monthly 1.1%/ rarely to never 78.3% /// Smartphone (Daily 40.3%/ Several times a week 1.1%/Weekly 6.5%/Monthly 0%/ Rarely to never 60.9%)</p> <p>Which digital services do you use the most: Internet 52.2%/Social media 25%/Online newspapers 17.4%/E-commerce (sell and buy) 12%/ Digital Maps 5.4%/Other: I can't use them on my own, only with help from others 6.7%/Other: I don't use them 39.1%</p> <p>Which expression describes you the most: I am always aware of the newest technologies 1.1%/I am always one of the first to buy the latest technologies 1.1%/ I can work well with the latest technologies 10.9%/I prefer my habits instead of trying out new things 23.9%/I am not concerned with the newest technologies 54.3%/Other: She needs help from the parents 6.7%</p> <p>VOLUNTEERS: How often do you use these devices: Computer (Daily 68.7%/Several times a week 16.5%/Weekly 16.3%/Monthly</p>	<p>The data was collected by an online survey that was send to the members, the volunteers and the employees of the LMS's, We have already 98 responses from the Services, 182 responses from volunteers and 92 responses from members. The data were interpreted from Questions 1, 2 and 3 of the survey provided to the volunteers AND Questions 5,6 and 7 of the survey provided to the members</p>
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							<p>1.6%/Rarely to never 6%/// Tablet (Daily 24.2%/Several times a week 11%/ Weekly 6%/Monthly 5.5%/ rarely to never 53.8% /// Smartphone (Daily 67.6%/ Several times a week 4.4%/Weekly 2.7%/Monthly 0%/ Rarely to never 25.3%).</p> <p>Which digital services do you use the most: Internet 94.5%/Social media 50%/Online newspapers 40.1%/E-commerce (sell and buy) 18.1%/ Digital Maps 36.3%/Other: I don't use them 1.6%/other: E-mail 2.2%/Other: Google 1%/Other: the mobile phone 1%.</p> <p>Which expression describes you the most: I am always aware of the newest technologies 6%/I am always one of the first to buy the latest technologies 0%/ I can work well with the latest technologies 32.4%/I prefer my habits instead of trying out new things 40.7%/I am not concerned with the newest technologies 19.8%/Other: I am open for new Technologies 1%/ Other: I will use new technologies if I find them helpful 1%.</p>	
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	Introduce real time capability to Less Mobile Services/MobiTwin	Reduce time in advance to book a trip	50% reduction in time before travel to book trip: currently 2 days in advance	Surveys	Users of Mobitwin	'Before' Surveys with LMS members, volunteers and employees	The need for transport for the members: Everyday (5.5%)/ 3 times or more per week (6.6%)/ 2 times a week (12.6%)/Once a week (11%)/No need (4.9%)/Other: 8.2%/ How urgent is the need for transport: Within the hour (2.2%)/Within 24h (3.8%)/ A day beforehand (6%)/2 days beforehand (13.2%)/ no urgency (20.9%)/Other (4.4%)	We asked the members e.g. "How often do you need 'urgent/real time' transport" "How would you define 'urgent'?" The data were interpreted from Q4 and Q5 of the survey provided to the members
	Increase number of volunteer drivers	Change in number of volunteer drivers	Absolute increase in number and 10% change	Member data	Volunteer Drivers	The data was collected by an online survey that was send to the members, the volunteers and the employees of the LMS.	Before situation: 28 volunteer drivers in Ghent and 22 in Oudenaarde	
		Change in time availability of volunteer drivers	10% change	Member data	Volunteer Drivers		"How often are you available for requested trip?" On a daily basis (20.3%)/Several times a week (49.5%)/Weekly (17.6%)/Monthly (5.5%)/ exceptional to never (1.6%)	
	Increase awareness of MobiTwin by target groups	Change in proportion of target group in demonstration area who are aware of Less mobile services / MobiTwin App	25% increase	'After' surveys with wider target group (including non-users of MobiTwin)	Wider target group		N/A	A survey to the wider target group is planned for the 'after' stage which will include retrospective questions on awareness and use.
		Change in proportion of target group in demonstration area who have used Less mobile services / MobiTwin App	10% increase	'After' surveys with wider target group (including non-users of MobiTwin)	Wider target group		N/A	A press campaign to create more awareness and reach more potential volunteers is planned in Flanders.

Table 3 Impact Evaluation Table for Flanders: Develop MaaS solution for migrants

Title of Measure/ Intervention	Objective	Indicators	Quantified Targets	Data collection method(s)	Stakeholders involved	Source of the data	Data Values	Comments
Develop MaaS solution tailored to (un)employed people with low income that have a migration background	Increase awareness and use of MaaS solutions by (un)employed migrants (with low income)	Number of NGO employees receiving training about the app provided to NGOs who work with the migrants target group	Use Olympus for at least 2 events / trainings, involving the target group, organized by (one of) the partners where we can promote the app to help access the event and to those attending the event	Count employees during training	NGOs + Users of Olympus app	Taxistop	18 NGO staff trained by mid-October 2019. More training sessions to be held.	Taxistop will be holding info-sessions for the employees of the NGOs because they will be the ones providing the survey to the test person + they will also be the first spokesperson if the test persons need any help. The info-sessions are delayed to September/October
		Number of (un)employed migrants with low income using the app	100 (un)employed migrants with low income to test the app	'After' data collection in Olympus app	Users of Olympus	Data collection in Olympus app	N/A	The data can only be collected with an after survey. We can't know the number of migrants using the app before presenting the app to them.
		Number of downloads by unemployed migrants	100 downloads	Downloads in Google Play Downloads in iOS	Users of Olympus	Downloads in Google Play Downloads in iOS	N/A	The data can only be collected at the 'after' stage.
		Increase number of PT trips to access job opportunities by migrants	3 trips per person by migrant users during the test phase	'Before' surveys and 'after' data collection in Olympus app	Users of Olympus	The NGO partners will provide the before surveys during their interview with the target group.	See comments	'before' data is collected for migrants, who are referred by the NGOs to use the app, just prior to the migrant using the app. Therefore not all 'before' data is collected at this stage and will continue to be collected right through the demonstration phase.
		Increase number of bike-sharing trips to access job opportunities by migrants	2 trips per person by migrant users during the test phase	'Before' surveys and 'after' data collection in Olympus app	Users of Olympus		See comments	

	Improve access to job opportunities for migrants	Number of migrants using Olympus App who accessed job opportunities they otherwise couldn't get to without the App	25% of test users	'After' Survey with migrant Olympus App users	Users of Olympus	'After' Survey with migrant Olympus App users	N/A	'Before' data not applicable
		Satisfaction with access to job opportunities amongst migrants	20% increase of migrants who are very satisfied or satisfied	'Before' and 'After' Survey with wider migrant population	Users of Olympus	The NGO partners will provide the before surveys during their interview with the target group. The survey asks e.g. "Do you feel you have easy access to job opportunities? Why? or Why not?"	See comments	'before' data is collected for migrants, who are referred by the NGOs to use the app, just prior to the migrant using the app. Therefore not all 'before' data is collected at this stage and will continue to be collected right through the demonstration phase.
		Provide more transport information to migrants with low income looking for job opportunities	30% increase of information about transport to migrants with low income who are looking for new job opportunities	'After' Survey with migrant Olympus App users	Users of Olympus	'After' Survey with migrant Olympus App users	N/A	'Before' data not applicable
		Reduce cost of transport as a barrier to access job opportunities	50% reduction in migrants with low income who think that the cost for public transport is a barrier	'Before' and 'After' Survey with wider migrant population + 'After' Survey with migrant Olympus App users	Users of Olympus	The NGO partners will provide the before surveys during their interview with the target group. The survey asks e.g. "Do you think PT is expensive?" "What are the reasons to not use the PT?"	See comments	'before' data is collected for migrants, who are referred by the NGOs to use the app, just prior to the migrant using the app. Therefore, not all 'before' data is collected at this stage and will continue to be collected right through the demonstration phase.

4.3 Discussion on validity of the data

For the MobiTwin App the 'Before' data collection has been undertaken through surveys with LMS members, volunteers and employees. A target sample size of 100 responses was sought for each group (members, volunteer drivers and LMS employees). While the response rates from employees (98 responses) and volunteer drivers (182 responses) has been good, the surveys directed to LMS passengers had a much lower initial response (15 responses) due to limited numbers of users with e-mail. To overcome this a second round of postal surveys was distributed resulting in 92 responses by mid-September 2019, but still increasing. This illustrates the limited use of basic technology by the target user group and highlights the probable need for the LMS providers to retain their role as human intermediary coordinating between elderly members seeking trips and volunteer drivers offering trips.

It is envisaged that the MobiTwin app can still provide benefits to volunteer drivers of sharing on-day availability and accepting trip requests in real time (rather than requiring 48 hours notice), while elderly members can make trip bookings up to time of travel either directly through the App (for those with the technical ability and confidence to use the MobiTwin App themselves) or via the LMS contact centre utilising the App on the members' behalf.

For the after data it is expected that there will be a gradual increase in users of the MobiTwin App (LMS providers, volunteer drivers and elderly members) over the demonstration period. To ensure sufficient users in each category on going engagement with LMS providers will be required to encourage them to promote the App to their volunteers and members. Crucially, the relationship and the cooperation with the LMS coordinators is delicate to Taxistop and it is important that LMS employees were supportive of the new MobiTwin App in order to gain engagement from members and volunteers. Initially the LMS employees had reservations on whether the volunteers and the members would be able to use the technology and feared that the social contact/interaction they currently experience with both the volunteers and the members would be lost. There were also concerns that the new technology could replace them, and they lose their job. They were reassured that their role was still required to provide the human intermediary coordination between elderly members seeking trips and volunteer drivers offering trips. Additionally, they needed convincing that rather than creating extra workload, the MobiTwin App removes some of the workload managing trips for those members / volunteers who are capable of utilising the technology unaided, thus freeing up some of their time to focus more on those members with the greatest need for assistance.

For the process evaluation it will be necessary that each category of user is consulted to understand what aspects of the MobiTwin app they found beneficial, how the App could be improved further, and their preferred method of working/booking (i.e. advance notice with no technology or on-day/real-time supported by the MobiTwin App).

In relation to the Olympus App, there have been significant problems in implementation and related to this in collecting the 'before' data required. This stems from the collapse of the STEP project which originally had committed to providing the engagement to the target group of migrant jobseekers. The STEP project consisted of a group of organisations offering support services to migrants seeking work and training. STEP had agreed to promote the Olympus App to their clients, collect data on their travel behaviour and attitudes, and to train them on the use of the App. Unfortunately, the original STEP partnership disbanded in Spring 2019, and so much time has been spent during late spring and summer 2019 finding other suitable migrant support organisations who can replace the STEP partners. This was achieved by September 2019, but the delays experienced have meant delays to the recruitment of migrant users for the Olympus App. As a result, the number of migrants included in the 'before' data surveys prior to using the Olympus App is relatively low at the time of publication of this Deliverable (Oct 2019), however, the number of migrants recruited to use the Olympus App can grow steadily over the demonstration period, as more migrants seek assistance from the new support partners. Most of the 'before' data indicators can be obtained at this point in time prior to them using the App and so the sample size of migrants contributing to many of the 'before' data indicators will increase during the demonstration phase.

All migrants that are referred to use the Olympus App will receive a mobility budget of €30 to remove the financial barrier of accessing employment. This should provide sufficient funds for their travel to work until they receive their first pay. In order to receive the mobility budget, migrants should be required to participate in an interview with the support partner where before data is collected, and also to answer an 'after' survey once they have used the App for a month and have spent their mobility budget. Although the overall number of migrant users of the App is expected to be relatively low, this approach should ensure a high response rate from those utilising the App.

The process evaluation will need to capture the difficulties encountered as a result of the collapse of the STEP project and to fully understand the role and importance of partnerships with organisations that support vulnerable groups when delivering these types of measure.

5 Rhein-Sieg region Pilot Lab (Germany)

Verkehrsverbund Rhein-Sieg (VRS), located in the southwest of North Rhine-Westphalia in Germany, provides its services in the region of Rhein-Sieg. The PL is in the Rhein-Sieg district, a partly rural and partly peri-urban district. It is an attractive region for families with young children because the real estate prices are lower than in Cologne or Bonn, and (most parts of) the Rhein-Sieg-Kreis (RSK) are well connected by train or car to Cologne and Bonn, where many RSK residents work. In general, the population of the RSK is expected to increase around 5.7% until 2040.

The current transport available provides mid-sized cities with connections to Cologne and Bonn via regional trains. Rural areas are connected via bus lines and demand responsive bus systems (TaxiBus, AnrufSammelTaxi) to mid-sized cities. The routes of the bus-lines and demand bus systems are not specific to the needs of young families but instead are designed to reach the centre of a city. The whole area is part of the VRS, which means it offers a unique tariff system and a (more or less) harmonised timetable. The demand bus supplements or replaces scheduled PT services, particularly in the areas where passenger demand varies greatly.

The Rhein-Sieg INCLUSION PL is focussed on expanding services to families with young children and teenagers. This population segment in the region, and especially in the new housing estate, does not have sufficient access to public transport for their daily trips, especially for multipurpose trip chains (e.g. taking children to/picking up children from kindergarten, shopping for daily needs, commuting to their jobs). Consequently, most people use their own cars (for example, 87% of inhabitants older than 10 years use the car 2-7 times a week, while public transport is used by only 24% at a rate of 2-7 times a week).

The main gaps and need for improvement focus around the issue that the PT network is currently designed to meet the needs of commuters and students and is concentrated within and around the city centre (or to the main train station) in a more or less direct way. Therefore, the PT options for multi-purpose trips often taken by families with young children in the (peri) rural area are currently very limited. The main goal is to respond to the needs of families with young children and teenagers in one selected new housing estate (Hennef Im Siegbogen) by improving the integration of different means of mobility with public transport and extending the concepts for the implementation of similar measures in other regions of the Verkehrsverbund Rhein-Sieg.

5.1 INCLUSION measures to be demonstrated

Deliverable 4.2 *Innovation Pilot Lab Rhein Sieg - implementation and results - intermediate version v1_0* describes in detail the measures to be demonstrated, their design and the implementation process of the measures. It also provides more detailed description of the characteristics of the Rhein-Sieg PL.

Following in-depth surveys with almost half of the households in the PL area, a number of measures for better meeting the needs of the target groups were identified, grouped into the areas of public transport and cycling. For public transport, the main focus was on improving services and providing cheaper fares for short non-regular trips (i.e. targeting local trips and infrequent connections to rail services rather than daily commuter trips); while for cycling, more and safer cycle paths and cycle facilities were identified as desired improvements. Table 4 summarises the INCLUSION measures being demonstrated and included in the impact evaluation for the Rhein-Sieg PL.

Table 4 Overview of INCLUSION measures being demonstrated in Rhein-Sieg PL

Measure name	Description
Bus line 532 – Increased service provision in Hennef Im Siegbogen	<p>Bus Line 532 provides the backbone of public transport in the new Hennef Im Siegbogen development area as well as providing connections to the main rail services to Bonn and Cologne.</p> <p>Through INCLUSION Bus line 532 will operate at double the current frequency (every 30 mins instead of every hour) and will extend the operating hours of the service during the afternoon and early evening, particularly important for school traffic, but also for leisure traffic such as trips to sports and club activities, visits to friends or relatives and the use of all kinds of leisure facilities such as cinemas, swimming pools, etc.</p>
Short-haul fare	A new lower fare is being introduced for short trips on the local bus line 532. This amounts to a 20% reduction on the previous fare for these trips and is applicable for most local journeys to school and for leisure purposes, complementing the increased service provision on line 532 to cater for these trips.
Forgotten paths	This measure involves the creation of new, better and safer cycle paths by identifying desired cross-connections and implementing designated cycle paths where this can be easily achieved. This includes shortened connections between for example schools, leisure facilities and public transport stops. The routes will then also be included in the "Mobil-in-Hennef" map and marked and communicated in the new Hennef Im Siegbogen development area. Secondary schools as well as the tourist office of the city of Hennef will be informed comprehensively and precisely about the results and the "newly discovered routes".

E-Bike rental	E-bikes are to be lent to people within the target groups on a weekly basis, for example, in order to enable their use to be integrated into everyday life.
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5.2 Impact evaluation tables

This section presents the impact evaluation tables for each of the measures identified in Section 5.1. These tables present the measure-specific objectives, define key performance indicators (KPIs) and targets relevant to the objectives, and identify the data collection methods, source of the data and stakeholders involved, the values of the 'before' data and any comment relevant to understand or explain the data for each KPI.

The main data collection tool was a detailed questionnaire sent to all 567 households in the Hennef Im Siegbogen development area. In total, 247 households took part in the survey, which corresponds to a response rate of around 44%. The survey was designed with close cooperation between VRS, Rupprecht Consult, the City of Hennef, the municipality of Eitorf and Rhein-Sieg-Kreis and were designed by the market research department of VRS. The questionnaire contained questions on the current general and situation-specific mobility behaviour of all household members, in particular children in the household. It was also possible to provide open answers. The wishes and/or the largest problems associated with current mobility were also sought, separated by transport mode. This survey provided the basis for most of the 'before' data KPIs identified in the Tables 5 to 8 below. In some cases, this survey data is supplemented by additional data from bus operators.

Table 5 Impact Evaluation Table for Rhein Sieg: Increase service provision

Title of Measure	Objective	Indicators	Quantified Targets	Data collection method(s)	Stakeholders involved	Source of the data;	Data Values ('before' data)	Comments
Increased service provision during off-peak and enhanced time table of bus line 532	Improve access to public transport in Hennef Im Siegbogen for families with children and for the children's own mobility	Outcome indicator 1: Change in no. of trips by bus in Hennef by parents accompanying children and unaccompanied children	5-10% increase in bus trips	Data collection via "before" and "after" surveys in buses of lines 532	Bus users in Hennef IS Rhein-Sieg municipality	Questionnaire s VRS; Data from bus operator	See comment	Data from bus operator isn't delivered yet
		Outcome indicator 2: Proportion of children accompanied by parents using bus at least once a week for regular trips.	5-10% increase	"Before" and "After" survey of the inhabitants of Hennef IS	Inhabitants of Hennef IS City of Hennef Rhein-Sieg municipality	Survey on the mobility offer in Hennef, Question 5	19%	
		Outcome indicator 3: Proportion of unaccompanied children using bus at least once a week	5-10% increase	"Before" and "After" survey of the inhabitants of Hennef IS	Inhabitants of Hennef IS City of Hennef Rhein-Sieg municipality	Survey on the mobility offer in Hennef, Questions 11, 12, 13	10%	
		Outcome indicator 4: Number of bus to train connected trips due to enhanced bus timetable	5% increase in number of train journeys made by target user groups	Data collection via "before" and "after" surveys in buses of lines 532; Questionnaire VRS	Rhein-Sieg municipality Bus operator	Questionnaire s VRS; Data from bus operator	See comment	Data from bus operator isn't delivered yet
		Outcome indicator 5: Changing trips from car to PT	2-3 trips/month by car replaced by trips by bus	"Before" and "After" survey of the inhabitants of Hennef IS	Inhabitants of Hennef IS City of Hennef Rhein-Sieg municipality	Survey on the mobility offer in Hennef, Questions 5, 8	Baseline car trips: 169 persons make trips by car (almost) daily; 51.5 persons make trips by car several times a week; 14.7 persons make trips by car several times a month.	Q. How often do you use the car? 245 persons answered this question and 69% of them stated (almost) daily. So it's 169 persons making trips by car (almost) daily; 21% of 245 stated they use the car several times a week, & 6% of 245 use the car several times a month
		Outcome indicator 6: Satisfaction with new mobility strategy in Hennef Im Siegbogen	5-10% increase of people who are very satisfied or satisfied by mobility offers in Hennef IS	"Before" and "After" survey of the inhabitants of Hennef IS	Inhabitants of Hennef IS City of Hennef Rhein-Sieg municipality	Survey on the mobility offer in Hennef, Question 4	15% very satisfied, 51% satisfied	
		Output indicator 1: Increased frequency of connections from Hennef Im Siegbogen to Hennef	2 trips per hour between 4.00 pm and 8.00 pm (instead of 1)	Bus timetables	Rhein-Sieg municipality Bus operator	Timetables from August 28 th , 2018	3 additional bus trips/day; New: two bus trips per hour	

Table 6 Impact Evaluation Table for Rhein Sieg: Reduce fare

Title of Measure	Objective	Indicators	Quantified Targets	Data collection method(s)	Stakeholders involved	Source of the data	Data Values ('before' data)	Comments
Changing tariff from 1a to short distance at bus lines 532	Improve access to public transport in Hennef Im Siegbogen for non-PT- or rare-PT-users	Outcome indicator 1: Change in no of trips by bus in Hennef by non-PT-users	5% increase in bus trips	Survey of the inhabitants of Hennef IS incl. compare-questions and influence of measures	Inhabitants of Hennef IS City of Hennef Rhein-Sieg municipality	Survey on the mobility offer in Hennef, Questions 5, 8	16% of the participants of the survey answered that they never use PT	Survey will be supplemented with ticket sales data
		Outcome indicator 2: Change in no of trips by bus by rare-PT-users	5% increase in bus trips			Survey on the mobility offer in Hennef, Questions 5, 8	43% of the participants of the survey answered that they use PT infrequently	
		Outcome indicator 3: Number of bus to train connected trips due to reduced bus fares	5 % increase in number of train journeys made by target user groups			Survey on the mobility offer in Hennef, Questions 5, 8	63% of the participants answered that they would use PT more frequently if the prices were better	
		Outcome indicator 4: Changing trips from car to PT	2-3 trips/month by car replaced by trips by bus			Survey on the mobility offer in Hennef, Questions 5, 8, 9	188 participants answered, they'd use PT more often for several reasons (prizes, higher clock rate...)	
		Outcome indicator 5: Satisfaction with new mobility strategy in Hennef Im Siegbogen	5% increase of people who are very satisfied or satisfied by mobility offers in Hennef IS			Survey on the mobility offer in Hennef, Question 4	15% very satisfied, 51% satisfied	
		Output indicator 1 Change in revenue from fares	The lower fare per single trip is balanced by the increase of passengers using the service	Fare revenue data from the bus operator	Rhein-Sieg municipality Bus operator		N/A	"Before" data not applicable
		Output indicator 2 Increased affordability for using PT from Hennef Im Siegbogen amongst families with children and for the children's own mobility	10% of families with children / teenage children state the new fares make them more likely to travel by bus in future	"Before" and "After" survey of the inhabitants of Hennef IS	Inhabitants of Hennef IS City of Hennef Rhein-Sieg municipality		N/A	"Before" data not applicable

Table 7 - Impact Evaluation Table for Rhein Sieg: Forgotten Paths

Title of Measure	Objective	Indicators	Quantified Targets	Data collection method(s)	Stakeholders involved	Source of the data;	Data Values ('before' data)	Comments
Forgotten paths	Improve usage of bikes (and e-bikes) in Hennef Im Siegbogen	Outcome indicator 1: Encourage use of new (old) bike connecting paths	5 trips per day at all new paths by families with children / teenage children	"Before" and "After" survey of the inhabitants of Hennef IS	Inhabitants of Hennef IS City of Hennef Rhein-Sieg municipality		N/A	"Before" data not applicable
		Outcome indicator 2: Change in trips by bike	5% increase in cycling trips			Survey on the mobility offer in Hennef, Questions 5, 8, 9, 15	14 people make trips by bike (almost) daily, 36 people make trips by bike several times a week, 55 people make trips by bike several times a month	
		Outcome indicator 3: Change in modal share of cycling	2-3 trips/month per family with children by car replaced by trips by bike			Survey on the mobility offer in Hennef, Questions 5, 8, 9, 15	Baseline: 261 trips by bike in bringing or picking up children	
		Outcome indicator 4: Satisfaction with new mobility strategy in Hennef Im Siegbogen	5% increase of people who are very satisfied or satisfied by mobility offers in Hennef IS			Survey on the mobility offer in Hennef, Question 4	15% very satisfied, 51% satisfied	
		Output indicator 1: New (old) connections will be reactivated	2 connecting paths will be reactivated/opened for bike use	Maps	City of Hennef Rhein-Sieg municipality		N/A	"Before" data not applicable
		Output indicator 2: Lowering the barrier for using bikes from Hennef Im Siegbogen and in Hennef	10% of families with children / teenage children state the new connecting bike paths make them more likely to travel by bike in future	"Before" and "After" survey of the inhabitants of Hennef IS	Inhabitants of Hennef IS City of Hennef Rhein-Sieg municipality	Survey on the mobility offer in Hennef, Questions 5, 8, 9, 15	Baseline: 261 trips by bike in bringing or picking up children	

Table 8 Impact Evaluation Table for Rhein Sieg: E-bike rental

Title of Measure/ Intervention	Objective	Indicators	Quantified Targets	Data collection method(s)	Stakeholders involved	Source of the data;	Data Values ('before' data)	Comments
E-Bike rental	Improve usage of bikes (and e-bikes) in Hennef Im Siegbogen	Outcome indicator 1: Change in trips by bike	5% increase in cycling trips	"Before" and "After" survey of the inhabitants of Hennef IS	Inhabitants of Hennef IS City of Hennef Rhein-Sieg municipality	Survey on the mobility offer in Hennef, Questions 5, 8, 9	6% of trips by bike (almost) daily, 15% of trips by bike several times a week, 23% of trips by bike several times a month	
		Outcome indicator 2: Change in modal share of cycling	2-3 trips/month per family with children by car replaced by trips by bike			Survey on the mobility offer in Hennef, Questions 5, 8, 9	261.2 trips by bike in bringing or picking up children	
		Outcome indicator 3: Number of bike to train connected trips due to e-bike service	5% increase in number of train journeys made by target user groups				N/A	"Before" data not applicable
		Outcome indicator 4: Satisfaction with new mobility strategy in Hennef Im Siegbogen	5% increase of people who are very satisfied or satisfied by mobility offer in Hennef IS			Survey on the mobility offer in Hennef, Question 4	15% very satisfied, 51% satisfied	
		Output indicator 1: Change in trips by e-bike	In average 5 rental trips per day for the bikes				N/A	"Before" data not applicable
		Output indicator 2: Lowering the barriers for using bikes from Hennef Im Siegbogen to destinations in Hennef	10% of families with children / teenage children state the new e-bikes make them more likely to travel by bike in future			Survey on the mobility offer in Hennef, Questions 5, 8, 9, 15	12.4 trips by e-bike in bringing or picking up children	

5.3 Discussion on validity of the data

The 'before' data was mainly obtained from detailed questionnaire sent to all 567 households in the Hennef Im Siegbogen development area in October and November 2018. In total, 247 households took part in the survey, which corresponds to a response rate of around 44%. This represents a very good response and provides sufficient numbers in different categories of target groups to provide robust evaluation. A €10 incentive voucher was offered to all who completed the survey. The 'after' data surveys will be delivered in the same manner to all households with a similar 'reward' for completing the survey. In addition, more specific surveys delivered directly to the users of the e-bike measure will supplement this general survey. These surveys will be distributed by the staff working in the tourist office (where the bikes are rented) directly to the users when they return the bikes, which will improve the validity of the data gathered since it will be fresh in their minds.

The measures relating to changes to bus timings and fares was due to be introduced at the end of the summer holiday (28 August 2019), however by the end of September 2019 the transport operator had still not implemented the decreased fare. This means the impact evaluation will be conducted over a relatively short demonstration period of less than 5 months (Oct 2019 – Feb 2020). This would be insufficient to provide the full impact of introducing a new bus route, however, where the changes are to the timings and fares on existing routes it should give a long enough period to give a fair reflection of the impacts as long as adequate marketing and awareness raising activity is in place to support this fare reduction measure and to ensure sufficient members of the community become aware of the changes introduced.

6 Budapest Pilot Lab (Hungary)

Budapest has a population of 1.75 million inhabitants and an extensive public transport system which includes a 39 km long metro network on four lines and one of the greatest tram networks in Europe. Tram 6 is the busiest tram line in the world, with more than 400,000 passengers daily. The tram network was extended in 2016 and comprises 36 lines. Providing equality of access for transport services is a key priority; however, the metro and tram network in Budapest is currently not accessible for everyone.

Despite the recent improvements in the infrastructure in terms of accessibility, the environment is still not inclusive. There are four metro lines in Budapest. Line 2 is partly accessible; line 4 is fully accessible; while stations on lines 1 and 3 do not have step-free access. Tram service is partly accessible. All stations on line 4-6 are step-free and a reconstruction programme in 2016 provided several additional fully accessible stations on the tram network.

The main gaps and need for improvements focus around the needs of the approximately 10-15% of all public transport users who are somehow reduced in their mobility (disabled, visually impaired, passengers with luggage, temporarily disabled people, or even people who do not speak the country's language). The general comprehension about accessibility is that it is an additional expenditure that is solely for disabled people. It is vital to re-educate the wider public with campaigns and retrain staff to change attitudes, from believing a passenger with a disability is a problem, to creating an inclusive, equitable environment which stimulates everyone to help passengers with reduced mobility and reduced ability to use the PT system.

The focus of the INCLUSION PL in Budapest will initially be on launching campaigns to better understand the needs of people with reduced mobility and on training the public transport staff to create a stimulus environment for social inclusion by providing appropriate assistance at stops and stations. Recent improvements in the accessibility of the built infrastructure are yet to be matched with similar improvements in social inclusion. Furthermore, encouraging co-operation among all stakeholders of persons needing assistance is also an important aim.

6.1 INCLUSION measures to be demonstrated

Deliverable 4.7 *Innovation Pilot Lab Budapest - implementation and results - intermediate version v1_0* describes in detail the measures to be demonstrated, their design and the implementation process of the measures. It also provides more detailed description of the characteristics of the Budapest PL.

The Budapest PL is introducing two INCLUSION measures, summarised in Table 9, to be demonstrated and included in the impact evaluation. The INCLUSION measures are being coordinated by the public transport authority of Budapest (BKK).

Table 9 Overview of INCLUSION measures being demonstrated in Budapest PL

Measure name	Description
Staff training	A new training programme for metro, tram and bus staff, ticket inspectors, and customer service employees will be developed and piloted in order to contribute to more competent staff behaviour and therefore a more inclusive environment.
Crowdsourced user needs platform	An online, public platform will be created to allow travellers to share their travel experiences and highlight specific issues/problems they face on the PT system. This will help BKK understand the needs, barriers and problems of the target group of travellers with reduced mobility and reduced ability to use the PT system.

6.2 Impact evaluation tables

This section presents the impact evaluation tables for each of the measures identified in Section 6.1. These tables present the measure-specific objectives, define key performance indicators (KPIs) and targets relevant to the objectives, and identify the data collection methods and stakeholders involved for each KPI.

For most of the outcome indicators where 'before' data needs to be collected, tailored surveys have been developed to be shared with members of BKK staff prior to receiving training and vulnerable passengers through the identified representatives of the vulnerable user groups e.g. National Institute for Blind and Visually Impaired People (Government institute); ETIKK (Universal Design Information and Research Centre of Hungary); FESZT (Council of Handicapped People); The National Association of Large Families; Budapest Airport; Tempus Public Foundation. Additional data collection relating to passenger satisfaction with the competence of employees and with ease of use of public transport services has been collected through mystery shopper test trips by a small sample of users within the different target groups.

Table 10 Impact Evaluation Table for Budapest: Staff Training

Title of Measure	Objective	Indicators	Quantified Targets	Data collection method(s)	Stakeholders involved	Source of the data	Data Values	Comments
Re-education and sensitisation of staff	Contribution to a more competent behaviour from public transport staff towards people with reduced mobility	Output indicator 1: Number of trained staff	Approximately 16% (50 employees) of ticket inspector and customer service employee, bus/ tramway/trolleybus drivers will be trained.	Attendance sheet	National Institute for Blind and Visually Impaired People (Government institute)	Training programme attendance sheet	85 members of staff trained	'Before data' is not applicable. 'After' data is reported for this indicator: Trained staff included ticket inspector, customer service employee, HR staff, bus- tramway- and trolleybus drivers
		Output indicator 2: Number of training hours	To sum up, 32 training hours will be held.	Training agenda - Attendance sheet	FESZT (Council of Handicapped People) (Overarching body)	Training programme	680 hours	'Before data' is not applicable. 'After' data is reported for this indicator: There were 85 members of staff trained with each attending an 8 hour training event.
		Outcome indicator 1: More competent employees	20 % increase in competency level of employees in the aspect of our target groups	Data collection through 'before' and 'after' surveys with employees at training	ETIKK (Universal Design Information and Research Centre of Hungary) (Research centre)	'Before' and 'After' questionnaire for trained staff.	Level of competency increased from 64% (before) to 83% (after).	Immediately before the training, staff completed a survey to establish their level of competence. This was completed again following the training course.
		Outcome indicator 2: Change in level of satisfaction and ease of use of PT by blind and visually impaired persons, disabled persons and persons with baby buggy.	10% increase in vulnerable users 'satisfied' or 'very satisfied' with public transport services	'Before' and 'After' surveys with vulnerable groups	Persons in vulnerable user groups	Test purchasing / test travel	50% very satisfied and 33% satisfied with staff competence levels: 25% very satisfied and 50% satisfied with ease of use of PT.	Prior to the staff training, selected persons from the identified vulnerable groups undertook test travels. Feedback and 'before' surveys were conducted with these travellers.
		Outcome indicator 3 Change in number of trips on public transport by vulnerable groups	10% increase in vulnerable users using public transport at least once a week	'Before' and 'After' surveys with vulnerable groups (users and non-users of PT services)	Persons in vulnerable user groups	Questionnaire for vulnerable groups (both users and non-users of PT services).	To be confirmed	Questionnaire will be sent for vulnerable persons via vulnerable associations. Includes Q's which establish if they are more likely to use PT because of the better staff support/attitudes – would they have used PT for this trip previously?

Table 11 Impact Evaluation Table for Budapest: Crowdsourced data needs platform

Title of Measure	Objective	Indicators	Quantified Targets	Data collection method(s)	Stakeholders involved	Source of the data	Data Values	Comments
Is Crowdsourced user needs platform	Improve public transport usability for people with reduced mobility	Output indicator 1: Number of announcements through BKK customer service e-mail address (bkk@bkk.hu) in the aspect of our target groups	5% increase the numbers of announcement from target groups.	Data collection through bkk@bkk.hu	BKK	BKK	See comment	Data for the announcements received via the e-mail address is available
		Output indicator 2: Number of announcements through jarokelo.hu webpage from PT users in the target groups		Data collection through jarokelo.hu webpage	Járókelők NGO	Járókelők NGO	There were 37 announcements related to accessibility issues in the period of 1st Sept 2018 - 28th Febr 2019	Note that these announcements relate to users in all the target groups. Also during this 'before' data collection period the feedback was to the general Járókelők.hu webpage and not the page dedicated to transport issues
		Output indicator 3: Number of solved announcements		Data collection through jarokelo.hu webpage	Járókelők NGO	Járókelők NGO	There were 9 solved announcements related to accessibility issues in the period of 1st Sept 2018 - 28th Febr 2019	
		Outcome indicator 1: Change in number of trips by blind and visually impaired people	Increase by 5% compared to the baseline	Data collection through 'before' and 'after' surveys with blind and visually impaired people	National Institute for Blind and Visually Impaired People (Government institute) ETIKK (Universal Design Information and Research Centre of Hungary) (Research centre)	Data collection through 'before' and 'after' surveys with blind and visually impaired people conducted by organisations representing target groups	See comment	Municipality elections in mid Oct 2019 delayed the approval for this campaign to commence. The 'before' data collection surveys will be completed by end October with the new Járókelők.hu webpage dedicated to transport issues launched in November 2019.
		Outcome indicator 2: Change in level of satisfaction of blind and visually impaired people	Increase by 5% compared to the baseline					
		Outcome indicator 3: Change in number of trips by disabled people	Increase by 5% compared to the baseline	Data collection through 'before' and 'after' surveys with disabled people	FESZT (Council of Handicapped People) (Overarching body) ETIKK (Universal Design Information and Research Centre of Hungary) (Research centre)	Data collection through 'before' and 'after' surveys with disabled people conducted by organisations representing target groups	See comment	

		Outcome indicator 4: Change in level of satisfaction of disabled people	Increase by 5% compared to the baseline				See comment	
		Outcome indicator 5: Change in level of satisfaction of passengers with luggage or baby buggy	Increase by 5% compared to the baseline	Data collection through 'before' and 'after' surveys with passengers with luggage or baby buggy	The National Association of Large Families (Overarching body)		See comment	
		Outcome indicator 6: Change in level of satisfaction of tourists	Increase by 5% compared to the baseline	Data collection through 'before' and 'after' surveys with tourists	Budapest Airport		See comment	
		Outcome indicator 7: Change in level of satisfaction of foreigners who live in Budapest on long term	Increase by 5% compared to the baseline	Data collection through 'before' and 'after' surveys with foreigners who live in Budapest on long term	Tempus Public Foundation / Erasmus+ programme (non-profit organisation established by Hungarian Government)		See comment	

6.3 Discussion on validity of the data

The 'before' data on related to the 'staff training' measure has been collected using the following methodologies:

- Survey with staff undertaking the training course on competency level of staff and on usefulness of the training.
- Mystery shopping, test trips, with small sample of selected users from target groups with 'before' and 'after' surveys on the change in level of satisfaction of staff competence and ease of use of public transport.
- In addition, a wider survey is being conducted with persons in the target groups to gauge the change in the tendency of usage of the public transport.

While the survey with staff are based on self-assessment, the mystery shopper test trips performed by target users before staff received the training and after the training provides an independent view on the changes directly experienced/noticed by the target users. These test trips involved all aspects of the journey including engagement with customer services, ticket purchase, and making the trip and so the vulnerable users encountered different staff who had been exposed to the training during all stages of the journey. Despite the relatively small number of mystery shopper test trips this form of assessment is particularly important to give an indication of the effectiveness of the staff training programme directly experienced by the target users. The 'after' test trips are undertaken shortly after the staff training is completed when the training is fresh in the minds of the staff. It will be beneficial to also undertake some 'after' test trips and surveys during Jan/Feb 2020 to assess if the training education has been retained by the staff and adopted in their regular working practice.

For the second measure, the crowdsourced user needs platform, the main difficulty in the 'before' data collection has been related to obtaining data specific to the target user groups. All data on announcements/complaints from passengers currently received does not identify if the user belongs to a vulnerable target group. In some cases, this can be assumed from the nature of the announcement/complaint received, but not always. This needs to be borne in mind when evaluating this measure. The after surveys with the target user groups will be especially important in assessing the impact of both these measures experienced by the specific target user groups. Having good support from organisations that represent the target groups will be crucial in obtaining sufficient responses from each target group. The support of these organisations will also be very important in marketing and making the users they represent aware of, and able to understand how to use, the jarokelo.hu INCLUSION subpage for submitting/sharing feedback on their public transport trip experience. The launch of the Jarokelo INCLUSION subpage for transport related feedback has been delayed until the second half of October 2019. The municipal elections are being held in Hungary on 13 October and it was felt that the nature of the website, highlighting problems and issues, was politically sensitive in the run up to the election. This is reducing the time available for use of the website

and for collecting data around its use which is necessary for the impact evaluation. The 'before' survey data collection with the wider group of target users has also been delayed until after the election. This is ready to commence immediately after the 13th October election has taken place.

7 Florence metropolitan area Pilot Lab (Italy)

The Italian PL is being conducted in two distinct areas within the metropolitan region of Florence - the economic, cultural and social capital of Tuscany Region.

In the first area, the pilot activities will be carried out in relation to two suburban bus routes (nos. 30 and 35), which serve an area from the central railway station to a deprived area in north of Florence. This is a peripheral zone of Florence with a lot of tenements inhabited by migrants and also social care centres. Therefore, migrants and modest income groups represent a large segment of public transport service users. The number 30-35 service is based on a conventional fixed public transport route. Although migrants are the largest number of users, the service is structured based on historical data without any particular attention given to the changing and specific needs of this user segment. This pilot study involves redesign of the routes to better respond to the demands of the migrant population combined with provision of information, including provision of on-board information monitors and App tailored to the needs of migrant users. In addition to this crowdsourced user feedback identifying issues in travelling experienced by migrants will be collected through the App.

The second target area is located in San Piero a Sieve, in the centre of the rural Mugello area, on the northern boundaries of the metropolitan conurbation. This area is characterised by sparse households and fragmented demand segments that contribute to make difficult to answer local mobility needs. Therefore, people with private cars use them for most or all of their trips, while others cannot easily reach Florence or other surrounding cities, resulting in reduced participation in society and increasing the risk level of social exclusion. The users in this area are mainly represented by rural commuters (students and workers). This pilot study involves a better understanding of the specific needs and levels of use of the services by the identified user groups; improvement of PT service accessibility; providing information tailored to user needs and improved multimodal travel information for journeys into Florence and main surrounding centres.

7.1 INCLUSION measures to be demonstrated

Deliverable 4.3 *Innovation Pilot Lab Florence - implementation and results - intermediate version v1_0* describes in detail the measures to be demonstrated, their design and the implementation

process of the measures. It also provides more detailed description of the characteristics of the Florence PL.

The Florence PL is introducing six INCLUSION measures, summarised in Table 12, to be demonstrated and included in the impact evaluation. The INCLUSION measures are being coordinated by the public transport authority of Florence (ATAF).

Table 12 Overview of INCLUSION measures being demonstrated in Florence PL

Measure name	Description
Reorganisation of bus line 30	This measure involves the redesign of the route including addition of two new bus stops and a new timetable for bus line 30. This has been done to better meet the needs and demands of the growing migrant community living near to the bus route and to provide a better direct connection from the bus to the recently opened tram line.
Install on-board monitors for passenger information in the lines 30 and 35 for migrants	With the expected increase of migrant passengers on bus line 30 and line 35, this measure provides new on-board monitors for passenger information offering information tailored to the migrants needs.
Introduction of new functionalities on existing App ATAF 2.0 for getting users' feedback in lines 30 and 35 for migrants	The existing ATAF 2.0 travel information and journey planning app adds functionality and features to enable passengers to share feedback on their travel experiences –and operated services in terms of frequency, quality of the service, intermodal coordination etc. The added features are designed with migrant users' needs and capabilities in mind and will be tested on lines 30 and 35 where levels of migrant passengers are relatively high.
Change of the bus routes in the rural area of S.Piero	Reorganisation of the bus routes and redesign of the S.Piero Train Station to enhance interchange opportunities and improve PT accessibility.
Introduction of new functionalities on existing App ATAF 2.0 for improving multimodal user information in the rural area of S.Piero	This measure will enhance the ATAF 2.0 travel information app to improve the multimodal user information for passengers making bus to train connections in the rural area of S.Piero. This measure supports the reorganisation of the bus routes and train station design to encourage and facilitate more public transport connections.
Introduction of new functionalities on existing App ATAF 2.0 for getting users' feedback in rural area of S.Piero for rural commuters	This measure will enhance the ATAF 2.0 App providing functionalities to collect crowdsourced users feedback on the operated service. This information will be used by PT operators and transport planning authorities to improve service provision thanks to a better understanding of user's needs.

7.2 Impact evaluation tables

This section presents the impact evaluation tables for each of the measures identified in Section 7.1. These tables present the measure-specific objectives, define key performance indicators (KPIs) and targets relevant to the objectives, and identify the data collection methods and stakeholders involved for each KPI.

Table 13 Impact Evaluation Table for Florence: Reorganisation of bus line 30

Title of Measure/ Intervention	Objective	Indicators	Quantified Targets	Data collection method(s)	Stakeholders involved	Source of the data	Data Values	Comments
Reorganisation of bus line 30: new path, additional two bus stops and new time tables	Improve access to public transport in the area close to line 30 for migrants	Outcome indicator 1: Change in no of trips by bus on line 30 by migrants	5% increase in bus trips	Data collection via "before" and "after" passenger counts on line 30	Ataf (bus operator)	Ataf (bus operator); Survey in December 2018 (reference in Power Point - slide 1)	115 migrants passengers/ peak hours in a typical workday, considering both directions	Considering that the % migrants is around 30% on line 30. In a Typical workday in the peak hours (07.30-09.00) 382 passengers on line 30, thus 115 migrants
		Outcome indicator 2: Proportion of migrants who are making bus to tram connections for work, services or leisure purpose	+10% increase	Data collection via passengers counts at the two new bus stops	Ataf (bus operator)	Ataf (bus operator)	N/A	'Before' data not applicable Tramway opened on 23rd February 2019; redesign of line 30 carried out in parallel to the finalization of the tramway
		Outcome indicator 3: Satisfaction with the public transport offer of users of line 30	10% increase of line 30 users who are very satisfied (Likert value 9 or 10) or satisfied (Likert value 8) by mobility offers	"Before" and "after" customer satisfaction surveys in buses of lines 30	Line 30 passengers; Ataf (bus operator)	Line 30 passengers; Ataf (bus operator) Survey made in December 2018: Question D8 general satisfaction level about the service (reference in Power Point - slide 2)	medium % satisfaction level: 6/10 (33%) 7/10 (30%) 8-10/10 (23%) Average Likert value: 6.36	Data collected in a typical workday and data divided by line
		Output indicator 1: Two additional bus stops of line 30	New path for line 30	Bus map	Ataf (Bus operator)	Ataf (Bus operator); Bus map showing the "old" line n° 30 before the re-organisation of the route (reference in Power Point - slide 3)	No bus stops were present in this area	
		Output indicator 2: Increased ease of access to associations, services or work place	10% reduction in the time of interchange between bus and tram	Bus and tram maps	Ataf (Bus operator)	Ataf (Bus operator); Bus map of mid-February 2019 (there is tram but not yet the reorganisation of line 30) (reference in Power Point - slide 3)	Walking distance from the nearest bus stop to tramway bus stop 700 m (9 minutes' walk)	

Table 14 Impact Evaluation Table for Florence: Install on-board information monitors

Title of Measure/ Intervention	Objective	Indicators	Quantified Targets	Data collection method(s)	Stakeholders involved	Source of the data	Data Values	Comments
Install on-board monitors for passenger information in the lines 30 and 35 for migrants	Improvement of the quality of the user information of the service in the urban lines 30 and 35 for migrants	Outcome indicator 1: Users satisfaction level with quality of information of migrants using PT in urban lines 30 and 35	+5% increase in migrants claiming to be very satisfied (likert value 9 or 10) and satisfied (likert value 8)	On bus passenger surveys with migrants in lines 30 and 35 (10-point Likert scale)	SOCIOLAB	SOCIOLAB; On bus passenger surveys with migrants in lines 30 and 35 (10-point Likert scale)	N/A	'Before' data not available for migrants; Data available for overall users of line 30 and 35. Change in satisfaction of migrant PT users will be retrospective in 'After surveys'.
		Output indicator 1: New panels installed on bus in lines 30 and 35	4 new panels on 2 buses on lines 30 and 35	Information document of the bus	Monitor provider	Monitor provider; Information document of the bus	N/A	"Before" data not applicable

Table 15 Impact Evaluation Table for Florence: Crowdsourced data functions added to ATAF App for migrants

Title of Measure/ Intervention	Objective	Indicators	Quantified Targets	Data collection method(s)	Stakeholders involved	Source of the data	Data Values	Comments
Introduction of new functionalities on existing App ATAF 2.0 for getting users' feedback in lines 30 and 35 for migrants	Getting a better understanding of the migrants' needs	Output indicator 1: Increase in the number of queries received from the users	+20% respect to the baseline	Comparison between data (queries received through traditional data collection campaigns, e.g. phone calls)	Line 30 and 35 passengers; Ataf (Bus operator)	Line 30 and 35 passengers; Ataf (Bus operator); Comparison between data (queries received through traditional data collection campaigns, e.g. phone calls)	From 01.01.2018 to 31.12.2018: Line 30 : 118 queries, Line 35 : 62 queries	"Before" data related to queries received by users through email and phone calls to ATAF complaints office
	Enhanced involvement of migrants	Outcome indicator 1: End-users participation in validating the existing service and in proposing new ideas and solutions	+10% of number of propositions respect to the baseline	Comparison between data (queries received through traditional data collection campaigns, e.g. phone calls)	Line 30 and 35 passengers; Ataf (Bus operator)	Line 30 and 35 passengers; Ataf (Bus operator); Comparison between data (queries received through traditional data collection campaigns, e.g. phone calls)	N/A	"Before" data not applicable. This information will only be collected at end of demo period
	Improving the appreciation of the bus service on lines 30 and 35	Outcome indicator 2: Satisfaction level of migrants towards the bus service on lines 30 and 35	+10% increase in migrants claiming to be very satisfied (likert value 9 or 10) and satisfied (value 8)	On bus passenger surveys with migrants through 'after' surveys with migrants on lines 30 and 35	Line 30 and 35 passengers; Ataf (Bus operator)	SOCIOLAB; On bus passenger surveys with migrants in lines 30 and 35 (10-point Likert scale)	N/A	"Before" data not available for migrants; Data is available for overall users of line 30 and 35.

Table 16 Impact Evaluation Table for Florence: Reorganisation of bus lines in S.Piero

Title of Measure/ Intervention	Objective	Indicators	Quantified Targets	Data collection method(s)	Stakeholders involved	Source of the data	Data Values	Comments
Change of the bus routes in the rural area of S.Piero	Improve the connectivity between different bus lines and the intermodality between bus and rail service for rural commuters	Outcome indicator 1: Increase in the number of user of PT service in rural area of S. Piero	+3% respect to the baseline	Data collection on passenger numbers prior to the bus service changes and after the bus service changes	BUSITALIA	BUSITALIA; Data collection on passenger numbers prior to the bus service changes and after the bus service changes	Morning+ afternoon+ evening (peak hours) total get on get off 2017 in a typical day: 598 passengers	Survey made before November 2017 (reference in Power Point - slide 4) Typical workday, passengers per day
		Outcome indicator 2: Increase in number of trips involving transport connection to train service due to redesign of bus routes	+10% respect to the baseline	Data collection through 'before' and 'after' surveys with rural commuters in the rural area of S. Piero	TRENITALIA; Users of bus/rail service in San Piero	TRENITALIA; Users of bus/rail service in San Piero; Data collection through 'before' and 'after' surveys with rural commuters in the rural area of S. Piero	About 5% of trips involve transport connection to train service	Survey made in December 2017: question no. D9 and D11 (reference in Power Point - slide 5)
		Output indicator 1: Reduction in travel time for the connection between two different bus lines and between bus and rail service	-10% respect to the baseline	San Piero a Sieve map	BUSITALIA	BUSITALIA; San Piero a Sieve map (reference in Power Point - slide 6);	Average travel time for connection: 0.54 x 4 mins + 0.46 x 30s = 143 seconds.	Average connection time: 4 minutes for 54% of bus users and 30 seconds for 46% of bus users. 54% of bus trips use line 302 which stops 300m from train station, while 46% use line 303 which stops adjacent to train station. Assumes pedestrian speed: 1,25 m/s.
	Improving the appreciation of the PT service in S. Piero Area for rural commuters	Outcome indicator 3: Increase of satisfaction level with ease of making connection	5-10% increase of people who are very satisfied or satisfied	Data collection through 'after' surveys with a "Likert scale" from 1 (very dissatisfied) to 10 (very satisfied).	Users of PT services in San Piero	Users of PT services in San Piero; Data collection through 'after' surveys with a "Likert scale" from 1 (very dissatisfied) to 10 (very satisfied).	N/A	"Before" data not available. 'After' surveys will ask about satisfaction with connection before the redesign and after the redesign.

Table 17 Impact Evaluation Table for Florence: Multimodal information functions added to ATAF App

Title of Measure/ Intervention	Objective	Indicators	Quantified Targets	Data collection method(s)	Stakeholders involved	Source of the data	Data Values	Comments
Introduction of new functionalities on existing App ATAF 2.0 for improving multimodal user information in the rural area of S.Piero	Improvement of the quality of the user information of the bus and rail services in the rural area of S. Piero to rural commuters	Outcome indicator 1: Increase in number of trips involving transport connection to train service due to improved multimodal info	+5% respect to the baseline	Data collection through 'before' and 'after' surveys with rural commuters in the rural area of S.Piero	TRENITALIA; Users of bus/rail service in San Piero	TRENITALIA; Users of bus/rail service in San Piero; Data collection through 'before' and 'after' surveys with rural commuters in the rural area of S.Piero	Approx. 6% of trips involve transport connection to train service	Survey made in December 2018: question D9 and D11
		Outcome indicator 2: Users satisfaction level with quality of information of the bus and rail services in the rural area of S. Piero to rural commuters	+15% claiming to be very satisfied (Likert value 9 or 10) and satisfied (value 8)	Data collection through 'before' and 'after' surveys with rural commuters in the rural area of S.Piero	TRENITALIA; Users of bus/rail service in San Piero	TRENITALIA; Users of bus/rail service in San Piero; Data collection through 'before' and 'after' surveys with rural commuters in the rural area of S.Piero	10% very satisfied (Likert value 9 or 10) 14% satisfied (Likert value 8) Average Likert value: 6.2	Survey made in December 2018: question no. D7_15 (reference in Power Point - slide 7)

Table 18 Impact Evaluation Table for Florence: Crowdsourced data functions added to ATAF App for rural commuters

Title of Measure/ Intervention	Objective	Indicators	Quantified Targets	Data collection method(s)	Stakeholders involved	Source of the data	Data Values	Comments
Introduction of new functionalities on existing App ATAF 2.0 for getting users' feedback in rural area of S.Piero for rural commuters	Getting a better understanding of the rural commuters' needs	Output indicator 1: Increase in the number of queries received from the users	+20% respect to the baseline	Comparison between data (queries received through traditional data collection campaigns, e.g phone calls)	Rural commuters of San Piero	Rural commuters of San Piero; Comparison between data (queries received through traditional data collection campaigns, e.g. phone calls)	From 01.01.2018 to 31.12.2018 Number of queries received about S.Piero: 55	"Before" data related to queries received by users through email and phone calls to ATAF complaints office
	Improving the appreciation of the PT service in S. Piero Area for rural commuters	Outcome indicator 1: Satisfaction level of rural commuters towards the PT service in the rural area of S. Piero	+10% claiming to be very satisfied (Likert value 9 or 10) and satisfied (value 8)	Data collection through 'before' and 'after' surveys with rural commuters in the rural area of S.Piero	Rural commuters of San Piero	Rural commuters of San Piero; Data collection through 'before' and 'after' surveys with rural commuters in the rural area of S.Piero	10% very satisfied (Likert value 9 or 10) 14% satisfied (Likert value 8) Average Likert value: 6.6	Survey made in December 2018: Question D8_1 general satisfaction level about the service (reference in Power Point - slide 7)

7.3 Discussion on validity of the data

Common surveys conducted by the public transport companies are generally addressed to all users of the PT service to have a useful thorough evaluation of the service from all passengers. Moreover, it's difficult to isolate specific target groups and obtain accurate answers only from them. To achieve the INCLUSION goal, BUSITALIA developed a co-participatory process with a number of travellers with migratory background in order to understand user's habits and spot their difficulties in using transport service and in understanding travel information. Given the difficulties to directly interact with the end users (i.e. migrants and low-income people), representatives of different user's associations have been involved through dedicated meetings since the beginning of WP4 activities. This allowed the involvement of several "end users" and their active involvement through specific focus groups. In particular, in order to ensure adequate feedback from users, the first two focus groups with migrants were held in Q2 2019. They aimed to identify the most significant issues that the migrant community would have perceived as barriers for using PT services and set out the 'ex ante' situation. A second round of focus groups will be organised starting from Q4 2019. These meetings will represent the occasion to collect information from migrants about satisfaction level on the measures developed within the project. Moreover, "after" surveys specifically dedicated to migrants will be elaborated to increase the level of accuracy of the data collection.

The timings of the demonstration period and its impact on 'before' / 'after' data collection has significance in the Florence pilot labs. Changes in bus routes in both pilot lab areas were introduced prior to the improvements to user information, and so it is important in the collection of data to distinguish between i) the impacts due to the change in service design and ii) those impact due to the improvement of user information. In particular, it is important to distinguish between satisfaction level related to the improvement of the service and the satisfaction level related to the improvement of user information. This is reflected in the impact evaluation indicators defined in the above tables.

The timing of the before data collection is therefore not the same for all measure indicators:

- the 'before data' collection related to the redesign of San Piero has to be referred to 2017 while the 'after data' collection was carried out at the end of 2018. The demo period has therefore been long enough to generate awareness of new initiatives and changes in behaviour; As no other measures or significant external factors had influence during 2018, the data collection really captures the impacts due to the redesign of the bus routes.
- concerning the re-design of line 30 in the deprived suburban area in the north of Florence the 'before data' was collected at the end of 2018. Since the new line started to be operational in February 2019, it was decided to carry out the 'after data' collection

starting from Q4 2019 in order to guarantee a monitoring period of at least 9 months; from October 2019, also the user information will be improved. Therefore, in order to distinguish between the impacts of the change in the bus line no. 30 and the impacts in providing improved information to user, specific questions, focused on each of the two measures, will be used. However, there is the small risk that passengers will be unconsciously influenced in their assessment by both measures. Indeed, the level of satisfaction about the improvement of user information could be in some way affected by the reorganization of the service, because the users' information may not be perceived in a positive way if passengers are not satisfied by the transport service offered. This will be carefully considered in the analysis of the results.

- as regards the improvement of user information, a long process of involvement of the migrant community was necessary. Therefore, the development and implementation of the new functionality of the App will start to be operational only from October 2019. Within INCLUSION timeframe this means that it will be possible to have an implementation period of around 4-5 months. There is a risk that this relatively short period for impact evaluation may not fully reflect the longer-term changes in travel behaviour which may result from the measure. Again, this will be considered in the analysis of the results.

It was also the case that many focus group participants were young (20-30) and predominantly male, so the views of older and female migrants might not have been adequately captured. It will be necessary to find strategies to reach out to these underrepresented groups when gathering the "after" data. Furthermore, about one-third of migrants attending the focus groups did not have a smartphone and therefore are not able to access and use the app or provide feedback in that way. For these migrants the on-bus after surveys will need to ask about age, gender and smart phone ownership in order to capture feedback relevant to migrants in these categories.

Considering business-as-usual scenarios, there should be no significant external changes occurring in the Florence pilot lab sites that could impact on evaluation indicators during the short evaluation period. This includes no short-term plans of changes to other services/nearby lines that could affect the travel behaviour or attitudes of target users. It has to be noted, however, that in recent years the Tuscany Region started a comprehensive reform of local public bus transport, which included the transition from the current 14 basins to a single one covering all the regional territory, the adoption of spending criteria based on standard costs and revenues, and the service assignment to a unique operator. The procurement process for such complex, extended and high-value tender, although started practically in 2011, is still ongoing due to the numerous proceedings among the competitors. There is the possibility that in the near future the approach, tools and

strategies adopted by Busitalia could be reviewed or modified. This will be monitored for its possible impacts on the INCLUSION impact evaluation results.

8 Barcelona peri-urban area Pilot Lab (Spain)

The focus of the Barcelona Pilot Lab is to reduce territorial accessibility barriers to attend cultural events located in peri-urban areas of the Barcelona Metropolitan Region, due to poor or inflexible transport offer. Target users are occasional groups of travellers (particularly young people), moving as individuals or small groups, travelling to common destinations such as music festivals. The pilot covers the peri-urban area of Barcelona Metropolitan Region (BMR), differentiating 4 sub-areas:

- Area 1 (First zone): comprising of other municipalities (outside Barcelona) in an official union of adjacent cities and municipalities called Barcelona Metropolitan Area (AMB), with a population of 3,220,071 in an area of 636 km² (Residential, Business, Leisure and Tourism).
- Area 2 (Second and Third zone): considered as an urban and metropolitan adjacent area. It forms a belt of cities: Vilanova i la Geltrú, Vilafranca del Penedès, Martorell, Terrassa, Sabadell, Granollers, Mataró and their respective areas of influence. The Catalan government projects the interconnection by means of the Orbital Railway Line (Residential, Business, Leisure and Tourism).
- Area 3 (Fourth, Fifth and Sixth zone): considered a territory of consolidated expansion. In the area, the expanse is of a radial type, spreading across fluvial corridors or depressions, as in the case of Manresa, Igualada and Vic, or continuing to the coast, as in the case of Blanes and El Vendrell (Residential, Business and Agriculture).
- Area 4 (Seventh zone): Includes long distance trips to other metropolitan and/or urban areas located outside of zone 6 but inside Catalonia; i.e. Lleida, Girona, Tarragona, etc.

The current transport situation prioritises public transport 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. Public transport authorities generally provide radial routes linking peripheries and the metropolitan centres. However, radial routes do not always meet the needs of citizens in outlying areas, since they are inflexible and often infrequent; thereby, forcing people to use cars.

The Barcelona Pilot Lab will be focused on one specific music festival, Canet Rock (<http://canetrock.cat/>). This festival takes place every summer in the village of Canet de Mar, located 45km north from Barcelona, within the fourth zone of the BMR. The event gathers more than 20,000 attendees every year. Public transport is essentially limited or non-existent, so the car is perceived as being the only option, despite private car use being more expensive and less sustainable. Currently, there is no historical information on demand for travel to the festival,

how it is structured, and how it can be served by flexibly adapted services; the only very limited information having been obtained through (outdated) surveys. The focus of the Barcelona PL is on applying ICT methods and tools to investigate the target groups' transport demand through information-mining from Social Networks and on organising transport services that adapt dynamically over time to meet the identified mobility needs and demand and improve transport accessibility. The goal is to enhance bus operators' technology and knowledge to provide innovative services that meet the needs of users traveling to events such as music festivals and sports events located in city peripheries or neighbouring towns.

8.1 INCLUSION measures to be demonstrated

Deliverable 4.6 *Innovation Pilot Lab Barcelona - implementation and results - intermediate version v1_0* describes in detail the measures to be demonstrated, their design and the implementation process of the measures. It also provides more detailed description of the characteristics of the Barcelona PL. The Barcelona PL is introducing two INCLUSION measures, summarised in Table 19, to be demonstrated and included in the impact evaluation. The INCLUSION measures are being coordinated by the technology company Mosaic Factor and bus operator BusUp.

Overall, the Barcelona PL aims to: Enhance specific data analytics tools and apply these to social media to identify unmet needs/demands; Propose and test smart mobility solutions (to include new routes for BusUp services) in the whole peri-urban region of the BMA to specific user groups of leisure travellers to specific events. The PL will assess the level of acceptance and satisfaction of the proposed smart mobility solution in a targeted area, by its targeted users, in terms of social inclusion, environmental sustainability and quality of life, etc.

Table 19 Overview of INCLUSION measures being demonstrated in Barcelona PL

Measure name	Description
Using social media to identify unmet needs/demands of people that want to attend Canet Rock 2019	<p>Two strands of Social Media analysis are applied to determine demand:</p> <ol style="list-style-type: none"> 1) Identifying the twitter accounts which are the most relevant to the event. For this study Mosaic developed and used their own algorithm. 2) Analysing the non-structured data analysis aiming to detect Twitter activity related to the event in different geographic areas. For this, the data analytics tool Moriarty, developed by ITAInnova. is used. <p>It is expected the use of these tools combined with other predictive algorithms (demographic distribution analysis, transport connectivity, historic attendees data etc.) can detect a particular interest of a specific group of the population, allowing the companies providing mobility services to offer tailored services to these target groups through the social networks which they utilise.</p>

Introduce new on-demand services to meet identified mobility needs of people wishing to attend Canet Rock 2019	Based on the demand identified through social media data analytics, new on-demand bus stops and routes will be delivered providing public transport services for those attending the Canet Rock festival.
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8.2 Impact evaluation tables

This section presents the impact evaluation tables for each of the measures identified in Section 8.1. Table 20 and Table 21 present the measure-specific objectives, define key performance indicators (KPIs) and targets relevant to the objectives, and identify the data collection methods and stakeholders involved for each KPI. It is worth noting that as the Canet Rock 2019 event was held in July, for some of the indicators both 'before' and 'after' data has already been collected and results relating to this are presented where appropriate.

Table 20 Impact Evaluation Table for Barcelona: Using Social Media to identify unmet demands

Title of Measure/ Intervention	Objective	Indicators	Quantified Targets	Data collection method(s)	Stakeholders involved	Source of the data	Data Values	Comments
Using social media to identify unmet needs/ demands	Quantify the improvement of the identification of potential demand (Comparison between canetrock'19 prediction and reality)	Comparison between potential interest for CanetRock 2019 (Mosaic study: PHOTO CANET) vs real interest for CanetRock 2019	80% of potential areas identified coincide with areas with real interest (attendees) for CanetRock 2019	Primary data collection through canetrock'19 sold tickets.	BusUp (on-demand bus transport services provider) CanetRock19 sold tickets Mosaic (technology provider)	Mosaic study to define the potential areas with interest to CanetRock19	80% of the Top100 municipalities have been identified with a BusUp stop 90% of the Top50 municipalities have been identified with a BusUp stop	<p>In total 119 municipalities are in the peri-urban area of Barcelona Metropolitan Region (BMR). Mosaic has identified from analysis of Twitter data the ranking of municipalities in terms of demand to attend CanetRock19.</p> <ul style="list-style-type: none"> - The 100 municipalities with most attendees in Canet Rock represents 75% of the total number of attendees. - Mosaic has identified the 80% of these top100 municipalities through social media analysis. - The 50 municipalities with most attendees in Canet Rock represents 60% of the total number of attendees. - Mosaic has identified the 90% of these top50 municipalities through social media analysis. <p>The municipalities were then classified as HIGH (32), MEDIUM (36) and LOW (51) candidates for having a BusUp stop. All of them were then modelled examining existing public transport service availability to the event as well as population density and demand to attend the event in previous years to identify the best locations for BusUp stops.</p>

		Comparison between predicted potential stops offered by BusUp for canetrock'19 (based on the Mosaic's results: PHOTO BUSUP) vs confirmed BusUp stops for canetrock'19	Confirmation of 75% of the potential stops proposed by BusUp (see comments)	Primary data collection through BusUp sold tickets for canetrock'19 Primary data collection through canetrock'19 sold tickets	BusUp (on-demand bus transport services provider) Mosaic (technology provider) Canet Rock (event organiser)		81% of the high potential stops published had success; 36% of the medium potential stops published had success	For the KPI analysis, we have focused on the HIGH (32) and MEDIUM (36) potential stops. The low potential stops are not included because BusUp only took them into account as complementary municipalities for their routes. 1)Mosaic has identified 68 municipalities with most interest to attend the CanetRock event using BusUp services differentiating 2 levels: 32 HIGH and 36 MEDIUM potential. 2) BusUp published 59% of the proposed stops within routes to CanetRock 3) BusUp cancelled 35% of the published stops two weeks before the event 4) The ones not cancelled, had 100% of success
		Comparison between predicted potential areas for canetrock'19 vs real canetrock'19 attendees' in those areas	70% of coincidence				67% of coincidence between canetrock'19 attendees and the predicted attendees in the high potential areas	Mosaics study: Predicted demand vs Real attendees CanetRock'19
		MODEL EXPLANATION: Correlation between the three key parameters: Attraction factor, canetrock'19 real attendees and BusUp sold tickets			BusUp (on-demand bus transport services provider) Mosaic (technology provider)	Mosaic study to define the potential areas to offer stops to go to CanetRock 20	The correlation between: - attraction factor and the canetrock'19 real attendees is 80%. - attraction factor and the BusUp sold tickets is 50% - BusUp sold tickets and the real attendees is 45%	(considering only the high potential stops)

Table 21 Impact Evaluation Table for Barcelona: Introduce new on-demand services to meet the demand

Title of Measure/ Intervention	Objective	Indicators	Quantified Targets	Data collection method(s)	Stakeholders involved	Source of the data	Data Values	Comments
Introduce new on-demand services to meet the identified mobility needs of people that want to attend to Canet Rock 2019	Improve access by public transport, from each area to Canet Rock festival	SERVICE IMPROVEMENT: Change in no of BUS SERVICES provided by BusUp, comparing to previous editions	10% increase in BusUp SERVICES	Primary data collection through BusUp services provided for canetrock'18 and canetrock'19	BusUp (on-demand bus transport services provider) Mosaic (technology provider)	BusUp bus services for CanetRock 2018	15 Bus services IN CANET ROCK 2018	
		SERVICE IMPROVEMENT: Change in no of DIRECT BUS SERVICES provided by BusUp, comparing to previous editions	10% increase in BusUp DIRECT SERVICES				2018: 3 direct bus service routes	
		SERVICE IMPROVEMENT: Change in no of STOPS covered by BusUp, comparing to previous editions	10% increase in BusUp STOPS	Primary data collection through BusUp sold tickets for canetrock'18 and canetrock'19		BusUp tickets data for stops to CanetRock 2018	22 INITIAL STOPS IN CANET ROCK 2018	
		SERVICE IMPROVEMENT: Change in no. of BUS TICKETS SOLD to attend the festival, comparing to previous editions	10% increase in BusUp TICKETS			BusUp tickets sold data for CanetRock 2018	1465 tickets sold IN CANET ROCK 2018	
		SERVICE IMPROVEMENT: Change in no. of BUS TICKETS SOLD to attend the festival, comparing to previous editions	10% increase in BusUp OCCUPATION RATE			BusUp tickets data per route to CanetRock 2018	Average 97% occupation per route IN CANET ROCK 2018	

		NEW DEMAND: Identify BusUp users attending the festival for the first time (difficulties to attend before/new demand)	Identify which % wouldn't have attended if they had no BusUp service	BusUp passenger surveys with BusUp users from each area (50 surveys)	BusUp (on-demand bus transport services provider) Mosaic (technology provider)	"Before" data not applicable	N/A	
			Identify which % would have used the car if they had no BusUp service				N/A	
			Identify which % of attendees are women				N/A	
			Identify which proportion of people attending the festival as first time are under 24				N/A	
			Identify which proportion of people attending the festival as first time are under 18				N/A	
		NEW DEMAND: Identify BusUp users attending the festival for the second (or more) time that used other transport mode to attend in previous editions and are changing their behaviour.	Identify which % wouldn't have attended if they had no BusUp service.	BusUp passenger surveys with BusUp users from each area (50 surveys)	BusUp (on-demand bus transport services provider) Mosaic (technology provider)	"Before" data not applicable	N/A	
			Identify which % would have used the car if they had no BusUp service.				N/A	
			15% of BusUp users have changed their mode of transport.				N/A	
			Identify which % of attendees are women				N/A	
			Identify which proportion of attendees are under 24				N/A	
			Identify which proportion of attendees are under 18				N/A	

	Improve safety and satisfaction levels of target group X from each Area that use BusUp to attend Canet Rock festival, compared to those who don't use BusUp	SERVICE QUALITY: Identify satisfaction level of BusUp users	70% of BusUp users are 'satisfied' or 'very much satisfied' with their mode of transport to the event	BusUp passenger surveys with BusUp users from each area (50 surveys)	BusUp (on-demand bus transport services provider) Mosaic (technology provider)	"Before" data not applicable	N/A	
			Identify which % of the people 'satisfied' or 'very much satisfied' are women				N/A	
			Identify which % of the people 'satisfied' or 'very much satisfied' are under 24				N/A	
			Identify which % of the people 'satisfied' or 'very much satisfied' are under 18				N/A	
		SERVICE QUALITY: Identify satisfaction for non-BusUp users, using other transport modes.	Identify the satisfaction levels of non-BusUp users, using another mode of transport to attend the event	Surveys at entrance to CanetRock with wider target group.	BusUp (on-demand bus transport services provider)	"Before" data from nonBusUp users surveyed at entrance to event	82% very satisfied 6.5% unsatisfied	Surveys conducted at entrance to Canet Rock festival with sample of all attendees – mainly non-users of BusUp services
			Identify which % of women 'unsatisfied' or 'very much satisfied'				80% very satisfied 10% unsatisfied	
			Identify which % of under 24's 'unsatisfied' or 'very much satisfied'				For women using other PT 0% very satisfied 50% unsatisfied	
			Identify which % of under 18's 'unsatisfied' or 'very much satisfied'				76% very satisfied 8.7% unsatisfied	
							For under 24 using other PT 16.7% very satisfied 50% unsatisfied	Note: The sample size of under18 non-Busup users is very small (6)
							66% very satisfied 0% unsatisfied	

		SERVICE QUALITY: Time reduction to go to the event (compared to Public transport)	Identify the time reduction to attend to the event (Canet de Mar) up to 50km in the Barcelona region	Primary data collection through different web services (e.g. Google Maps)	Mosaic (technology provider)	Connectivity study (MOSAIC)	64%-time reduction	PER DIFFERENT AREA, saved time given the DIFFERENCE BETWEEN PT (fastest) AND PRIVATE CAR to CanetRock and time of reduction in %.
			Identify the time reduction to attend to the event (Canet de Mar) from 50km to 100km in the Barcelona region				63%-time reduction	
			Identify the time reduction to attend to the event (Canet de Mar) up to 50km in the Girona region				63%-time reduction	
			Identify the time reduction to attend to the event (Canet de Mar) from 50km to 100km in the Girona region				56%-time reduction	
			Identify the time reduction to attend to the event (Canet de Mar) from 50km to 100km in the Lleida region				65%-time reduction	
			Identify the time reduction to attend to the event (Canet de Mar) from 100km to 150km in the Lleida region				50%-time reduction	
			Identify the time reduction to attend to the event (Canet de Mar) from 50km to 100km in the Tarragona region				45%-time reduction	
			Identify the mean of time reduction to attend to the event from all the Barcelona Metropolitan Region (all municipalities included)				For all stops, 60% of time reduction respect to the public transport mean.	
		SAFETY PERCEPTION of BusUp users	70% of BusUp users in area indicate 'Safe' or 'very much Safe' with their mode of transport to the event	BusUp passenger surveys with BusUp users from each area (50 surveys)	BusUp (on-demand bus transport services provider) Mosaic (technology provider)	"Before" data not applicable	N/A	
			Identify which % of the people 'safe' or 'very much safe' are women				N/A	
			Identify which % of the people 'safe' or 'very much safe' are under 24				N/A	
			Identify which % of the people 'safe' or 'very much safe' are under 18				N/A	

		SAFETY PERCEPTION of people that have used other mobility services (no BusUp)	Identify the safety perception levels of non-BusUp users, using different mode of transport to attend the event.	Surveys at entrance to CanetRock with wider target group.	BusUp (on-demand bus transport services provider)	"Before" data not applicable	72% very safe 28% safe	Surveys conducted at entrance to CanetRock festival with sample of all attendees – mainly non-users of BusUp services
			Identify which % of the women feel 'safe' or 'very much safe'				76% very safe 24% safe For women using other PT 60% very safe 40% safe	
			Identify which % of the under 24's feel 'safe' or 'very much safe'				65% very safe 35% safe For under 24's using other PT 66% very safe 33% safe	
			Identify which % of under 18's feel 'safe' or 'very much safe'				83% very safe 17% safe For under 24's using other PT 50% very safe 50% safe	

8.3 Discussion on validity of the data

The 'before' data relating to the unmet needs/demands analysis primarily relates to the outputs from the analysis of social media Twitter data to establish locations where demand for travel to the festival exists. Technical limitations of the Twitter data include the low proportion of Twitter posts which have geolocation data associated with them (as low as 15%). Furthermore, it's not possible to scrape data from other social media (e.g. Facebook or Instagram) because they've blocked this possibility. Hence the demand location data which is derived only represents a fraction of the actual demand but should still provide a reasonable reflection of the locations with highest demand. The Twitter data derived locations are then modelled with existing transport services, population density and previous festival attendees to estimate the best locations for new BusUp stops and routes. The 'after' data will then reveal the extent to which these modelled stops/routes become booked and then utilised by festival attendees. The uptake, of course is affected by other factors such as availability of lifts from friends/family and the success or otherwise of the marketing and promotion of the BusUp routes. It is therefore necessary to understand reasons why festival goers did and didn't book and use BusUp services to attend the festival. It is also the case that some BusUp routes suggested by the demand analysis were withdrawn by the bus operator prior to the festival due to insufficient bookings and or insufficient declarations of interest. It will be important to learn the reasons for this and how it can be minimised in future. This should be a focal point of the process evaluation work.

Establishing 'before' data from the target users for the new on-demand services measure is challenging because this is an annual event for which the audience changes each year and no survey data exists from those that attended the event in previous years. The approach used is to compare the attitudes of those attending the event who did not use BusUp services (surveys conducted at entrance to the festival) with those who did use BusUp services (surveys conducted while travelling to the festival on the BusUp service). This is supported by 'after' surveys conducted on the BusUp services asking if the passengers had attended the festival in previous years and retrospectively eliciting their 'before' attitudes and satisfaction etc.

9 Cairngorms National Park Pilot Lab (UK)

Cairngorms National Park (CNP) (<http://cairngorms.co.uk/>) is one of the most popular tourism destinations within the Scottish Highlands, the most remote region in Scotland, and comprises an area of 4528 sq km. Although the local resident base is around 20,000, the area experiences more than one and a half million visitors per year for summer hiking and winter skiing. The underlying public transport infrastructure is fragile and includes fixed route bus and rail (both privately operated), some open access Demand Responsive Transport (operated by Community Transport and local authorities) and taxis.

The main aim of the CNP Pilot Lab is to improve accessibility to public transport for older persons, young adults, teenagers and tourists in CNP, with e-bikes and car clubs being the main measures to be implemented in INCLUSION to achieve this objective. HITRANS, the regional transport authority, are planning to install e-bike hubs in Aviemore, Grantown-on-Spey and Aberlour, for use by both tourists and local residents, with hope of a modal shift from private car to e-bikes for tourists and providing greater access for local activities and services for residents. The learning gathered from this initial roll-out will inform future plans for further sites. HITRANS are also working with car club operators in the area to encourage moving services into CNP to provide additional more sustainable transport services, with existing car club schemes in close proximity to CNP. The aim is that the e-bike and car club services will complement each other to replace key stages of journeys that are largely completed by private car use at present due to a lack of available services.

Complementary to this, HITRANS is also working with MaaS Scotland, Transport Scotland, local stakeholders and experts to assess if Mobility as a Service (MaaS) could work in CNP; particularly for tourists arriving in the area who wish to complete their journeys without the use of private cars. This will form ongoing research throughout the pilot lab, and will be evaluated through process evaluation at the end of the project, along with the impact and process evaluation of the e-bike and car club measures. As a result of this, HITRANS will bring wider research to the INCLUSION project on issues related to governance and mobility management, such as work being conducted through the Cairngorms Connected project, gathering user-centred research on transport needs in CNP to co-create ideas for new mobility services.

9.1 INCLUSION measures to be demonstrated

Deliverable 4.4 *Innovation Pilot Lab Cairngorm National Park - implementation and results - intermediate version v1_0* describes in detail the measures to be demonstrated, their design and

the implementation process of the measures. It also provides more detailed description of the characteristics of the Cairngorms PL.

The Cairngorms National Park PL is introducing two INCLUSION measures, summarised in Table 22, to be demonstrated and included in the impact evaluation. The INCLUSION measures are being coordinated by the regional transport authority for the Scottish Highlands (HITRANS).

Table 22 Overview of INCLUSION measures being demonstrated in CNP PL

Measure name	Description
Introduction of e-bike hubs at number of locations in CNP	The EBike project in Speyside / Cairngorms, is focussed on implementing 3 small scale E-Bikes hubs in a key gateways towns/transport interchanges for the national park. HITRANS targeting a modal shift and creating a safer active travel environment for residents and visitors to access the National Park. The learning gathered from this initial roll out will inform future plans for further sites in these towns and also to new settlements building on learning and research gained from other current projects
Introduction of car club in Aviemore	Introduction of a small Car Club in Aviemore to meet mobility demand in that area. This is likely to be limited to three cars available to Car Club members. Strategies will be developed to promote and encourage use by young adults.

9.2 Impact evaluation tables

This section presents the impact evaluation tables for each of the measures identified in Section 9.1. Table 23 presents the measure-specific objectives, define key performance indicators (KPIs) and targets relevant to the objectives, identify the data collection methods, source of the data and stakeholders involved, the values of the 'before' data and any comment relevant to understand or explain the data for each KPI.

Table 23 Impact Evaluation Table for Cairngorm National Park: Introduce e-bike scheme

Title of Measure	Objective	Indicators	Quantified Targets	Data collection method(s)	Stakeholders involved	Source of the data	'Before' Data Values	Comments
Introduction of e-bike hubs at a number of locations in CNP	Integrate e-bike schemes with public transport in Cairngorm National Park	Output indicator 1: number of elderly people using an e-bike	number of each target user group using an e-bike	Data from bike hires can be analysed and sorted by category, e.g. tourist or resident, age group, number of hires per month, etc.	Target user groups, e-bike scheme operators	Implementation Period, post-hire surveys with hirers of e-bikes	N/A	Before data not applicable. After data collection will take the form of E-bike hirer/user self-selecting opportunity sample
		Output indicator 2: number of persons of reduced mobility using an e-bike						
		Output indicator 3 number of local residents suffering from fuel poverty using an e-bike						
		Output indicator 4 number of tourists using an e-bike						
		Outcome indicator 1: Number of trips using public transport by elderly people	Increase in number of public transport journeys made by target user groups	This is collected at the 'after' stage by surveys of those who hired the e-bikes (if permission from the user is granted) to ask for details of their onward travel, e.g. did they use public transport as part of their journey, did the e-bike assist with this, if the e-bike had not been available what transport would they have used for their journey, what was the purpose of their journey etc. Could also be monitored through bookings or discounts with public transport providers	Target user groups, e-bike scheme operators to distribute the survey	Implementation Period, post-hire surveys with hirers of e-bikes Scottish Household Survey extracts Cairngorm National Park visitor survey	See comments	This data will be collected at the after stage through surveys with users of the e-bikes. This will be supplemented with data from existing survey data such as the Scottish Household Survey by extracting data for the postcodes relevant to the locations where the e-bikes are implemented. Once these locations are decided the survey data can be obtained.
		Outcome indicator 2: Number of trips using public transport by persons of reduced mobility					See comments	
		Outcome indicator 3: Number of trips using public transport by local residents					See comments	
		Outcome indicator 4: Number of trips using public transport by tourists					See comments	

		Outcome indicator 5: % increase in respondents selecting 'very satisfied' or 'satisfied' with active travel offerings in CNP	Aim for a 25% increase in respondents indicating an increase in satisfaction with active travel in the area as a result of e-bikes	Results from the e-bike user surveys analysed against results from the wider survey to assess if there has been an increase in satisfaction with active travel offerings in CNP, and whether the e-bikes has contributed to this. Answers will be filtered and analysed for each target user group.	Residents in CNP, target user groups, consultants conducting survey research	Surveys and workshops (AECOM work)	See comments	This data will be collected at the after stage through surveys with users of the e-bikes as well as through a sample of all residents living in the catchment area. Awaiting confirmation of location of e-bike hubs to define catchment area.
		Outcome indicator 6: Change in level of satisfaction with access to public transport in Aviemore / Grantown-on-Spey	10% of survey respondents from each target group strongly agreeing or slightly agreeing that e-bikes have increased their access to public transport	Survey with e-bike users and those in catchment area (see outcome indicator 5)			See comments	

9.3 Discussion on validity of the data

The 'before' data for the impact evaluation is available through several existing sources such as Cairngorms National Park visitor surveys, Scottish Household Survey and HITRANS Active Aviemore work. Also, adaptations have been introduced to existing data collection methods such as the Cairngorms National Park visitor survey, Cairngorm Connected and Innovate UK project surveys where survey questions related to INCLUSION measures have been added. In addition to surveys, a number of workshops and interviews have also been conducted with stakeholders and persons from the target groups where more in depth feedback has been obtained.

The majority of the data being collected is based on utilising other surveys for the intention of providing best value data for INCLUSION and limiting the incurrence of additional costs for HITRANS. The majority of the data collection is on the basis of a random opportunity sample of the Pilot Lab catchment area population. However, the problems in securing confirmed funding to implement the e-bike measure has meant the scale and location of the e-bike hubs have not yet been established and so the catchment area has not been clearly defined. The result of this is that surveys with the wider population of target users within the catchment area has not yet been conducted, nor has location specific analysis of existing data sources been possible.

Given the difficulties of funding interventions, there will also be a very limited window to evaluate change in behaviour, however even if it was the full 6 months, even that might be not a long enough research design to demonstrate sustainable change in behaviour and the longitudinal change in habitual behaviours such as driving for a significant majority of journeys. The issue of the implementation period being in Autumn and Winter within a higher altitude northern Europe rural area will also limit the potential attitudinal and normative intentions towards trying an e-bike.

The difficulties and delays experienced in relation to successfully implementing the e-bike and car share measures, has resulted in a low likelihood of being able to conduct any form of impact evaluation for the car share measure, and the likelihood that any impact evaluation possible for the shared e-bike measure will not reflect the true potential of this service due to the more limited use of e-bikes expected during dark and cold winter months. As a result of this, the process evaluation will provide a more illuminating account of experiences within this pilot lab and provide valuable lessons for transfer elsewhere.

10 Conclusions

This Deliverable, D5.4, presents the 'Reference Scenarios' which detail baseline situations before the INCLUSION measures have been introduced for a set of impact evaluation performance indicators. Each of the six project Pilot Labs has a dedicated chapter which outlines the measures being implemented within WP4 and subject to impact evaluation within WP5. For each of these measures, the specific objectives and associated key performance indicators (KPIs) are defined and, for KPIs where 'before' data is relevant, the data collection sources and methods are described and the 'before' data values are presented. Equivalent 'after' data values will be collected by the end of February 2020 from which impact evaluation findings can be derived. For indicators where only 'after' data is relevant, or where it has not been possible to collect before data this is highlighted, and explanations provided as to the reasons for this and the alternative approach for evaluating impact described.

Each chapter also provides a discussion on validity of the data (e.g. sample size, relevance of data to target group, issues with data collection / completeness) and considerations for 'after' data collection (sources / methods / timing).

There are a few important issues relating to delays in the implementation of some measures which have a knock-on effect on the impact evaluation. This includes delays in implementation due to a number of reasons:

1. Delays due to political disruption; e.g. in Budapest political sensitivities in run up to municipal elections in mid Oct 2019 have delayed the launch of the crowdsourcing data platform – this measure is now expected to launch after the elections in November 2019.
2. Delays due to organisational disruption; e.g. in Flanders the local actors/NGO organisations supporting migrant jobseekers have been subjected to re-organisation due to funding changes. As the INCLUSION measure to demonstrate the Olympus App with migrants relies on the active support of these organisations it has not been possible to commence the testing of the measure or even to capture 'before' data with this target group when planned. New migrant support teams have now been re-established by the NGOs and this measure is likely to be fully supported by these teams from November 2019 onwards.
3. Delays due to priorities of local actors; e.g. in Rhein Sieg the measure which provides a 20% reduction in bus fares for single journeys relies on the local bus operator introducing this. Operational priorities of the bus company have delayed the implementation of this measure. Although not yet in place it is anticipated that the measure will become active in October 2019.

4. Delays due to issues securing funding; e.g. in Cairngorm National Park, while the funding to purchase the e-bikes has been secured, the implementation of e-bikes has been delayed due to problems securing funding for the supporting hub infrastructure. This has also impacted on the collection of 'before' data as without knowing where the hubs will be located it hasn't been possible to define the e-bike catchment area in which to conduct 'before' surveys. By mid-October 2019, no satisfactory resolution to the funding issue has been found.
5. Delays due to lack of capacity: e.g. in CNP the car club providers operating in neighbouring towns had expressed interest to expand to the CNP area, but the nature of these car club providers in rural areas (charities with very small scale operations) meant they did not have the capacity to expand their services in the timescales of the INCLUSION project. It is unlikely that this can be resolved by the end of the INCLUSION impact evaluation period (March 2020).

In the first three cases these issues have had the effect to shorten the period of demonstration where impact evaluation is conducted from 8 to 4 months. Although not critical, this is likely to reduce the number of users and uses of these measures which of course weakens the impact. In the fourth case it is not known when or if a solution can be found to enable the e-bike measure to be implemented before the end of the INCLUSION impact evaluation period (March 2020). In the fifth case it will not be possible to build sufficient capacity in the local car clubs to expand operations into the CNP area before the end of the INCLUSION impact evaluation period (March 2020). In all cases there are very valuable lessons being learnt which are being captured through the process evaluation activities.

The impact evaluation 'after' surveys will be conducted during February/March 2020 and reported on in Deliverable D5.5 'Full Evaluation, the test results' due Month 30 (end March 2020).

The results of the impact evaluation in combination with the process evaluation will allow for important factors of success/failure to be identified within the context of the conditions in which the measures have been implemented. Cross-case analysis will also be conducted to find similarities and differences among the PL measures taking account of the widely differing implementation environments and target user groups. This is crucial for identifying transferability recommendations which will be reported on in D5.6 'Evaluation of findings and transferability potential at European level' due Month 32 (end May 2020). This will present a synthesis of both the impact and process evaluation results, highlighting key findings and good practices and assessing transferability potential of the measures.

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