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NEW MOBILITY SOLUTIONS TO FIGHT TRANSPORT POVERTY AND EXCLUSION IN EUROPEAN CITIES AND REGIONS

Key Words

Accessibility;
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Abstract

The lack of public transport options often means less access to goods and services, to job market, education, and recreational activities, which they all impact on the human wellbeing and social cohesion. People who do not have enough resources to access to more expensive mobility options could be automatically excluded from society. At the same time, other capabilities such as physical and mental health play a key role in social exclusion particularly in some deprived urban neighborhoods or remote rural areas across Europe. Vulnerable user categories such as mobility impaired and elderly people, youngsters, low income and unemployed persons, socially excluded or poorly integrated communities, migrants, etc. face a major risk. The social aspect of transport is key in addressing current societal issues such as migration, raising poverty, social exclusion, ageing society. The EU-

funded project INCLUSION (<http://www.h2020-inclusion.eu/>) is an addressing public transport accessibility, inclusivity and equity in a number of mobility conditions, including urban centers, deprived neighborhoods, remote rural areas and various user segments affected by some form of transport vulnerability or poverty. During its duration, the project is innovating the way transport is designed, organized, operated for the targeted user groups along three main investigation strands: Enabling technologies (ICT, ITS) through dynamic planning, optimization, operation; mobile Apps; IoT devices, wearables; social media; etc; New organizational and service provision forms such as vehicle sharing, co-ownership, liftsharing, flexible transport (DRT), combined mobility, MaaS; Social Innovation as a mix of new elements different from traditional transport economies based on the production and consumption of services/commodities. Innovative accessible transport solutions are being tested in Pilot labs in Belgium, Germany, Hungary, Italy, Spain and the UK with the purpose to finally transfer them to other prioritized areas across Europe.

1. INTRODUCTION

New mobility solutions to fight transport poverty and exclusion in European prioritized areas

The lack of public transport options often means less access to goods and services, to job market, education, and recreational activities, which they all impact on the human wellbeing and social cohesion. People who do not have enough resources to access to more expensive mobility options could be automatically excluded from society. At the same time, other capabilities such as physical and mental health play a key role in social exclusion particularly in some deprived urban neighborhoods or remote rural areas across Europe. Vulnerable user categories such as mobility impaired and elderly people, youngsters, low income and unemployed persons, socially excluded or poorly integrated communities, migrants, etc. face a major risk. The social aspect of transport is key in addressing current societal issues such as migration, raising poverty, social exclusion, ageing society.

The EU-funded project INCLUSION (<http://www.h2020-inclusion.eu/>) is addressing public transport accessibility, inclusivity and equity in a number of mobility conditions, including urban centers, deprived neighborhoods, remote rural areas and various user segments affected by some form of transport vulnerability or poverty. During its duration, the project is innovating the way transport is designed, organized, operated for the targeted user groups along three main investigation strands:

- Enabling technologies (ICT, ITS) through dynamic planning, optimization, operation; mobile Apps; IoT devices, wearables; social media; etc.
- New organizational and service provision forms such as vehicle sharing, co-ownership, lift-sharing, flexible transport (DRT), combined mobility, MaaS.
- Social Innovation as a mix of new elements different from traditional transport economies based on the production and consumption of services/commodities.

Innovative accessible transport solutions are being tested in Pilot labs in Belgium, Germany, Hungary, Italy, Spain and the UK with the purpose to finally transfer them to other prioritized areas across Europe.

A key aspect of the work is to investigate 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 concerned users. This paper showcases innovative solutions from three pilot areas where ICT enabled social innovation is being developed or demonstrated. These offer a variety of technology-centered solutions ranging from delivery of completely new transport services, enhancements in operating performance of existing services, or improved understanding and awareness of user's needs and how to better cater for these.

2. EXAMPLES OF MOBILITY SOLUTIONS EMPLOYING ICT ENABLED SOCIAL INNOVATION

2.1. Barcelona Metropolitan Region: peri-urban areas and rural hinterland

Mobility planners want to improve transport accessibility in order that area residents may more easily attend cultural events in peri-urban areas of the Barcelona Metropolitan Region. Currently, public transport services are operated on a radial route structure linking peripheries and the metropolitan center. This does not meet the needs of citizens in the outskirts of Barcelona and neighboring towns, however, as services are inflexible and often infrequent, particularly at night.

The focus of this pilot initiative is to provide a safer, cheaper and more comfortable way for teenagers and young adults living outside the city to travel to a major music festival (Canet Rock) held overnight on the peri-urban fringe of Barcelona in Canet de Mar.

The solution applies information mining from Social Networks (Twitter) to identify the demand from potential users who want to attend the festival. This approach involves two different types of analysis: first, analyzing Twitter relationships of users connected with the "festival accounts core"; and second, analyzing non-structured data of Tweets. The social network data is combined with data on demographic distribution (highlighting the key geographic areas in the region), transport connectivity (between each geographic area and Canet de Mar), and historic data of festival attendees from previous years. This analysis enables planners to aggregate the mobility demand (event attendees) from different

geographic areas which are poorly served by existing PT service provision and use this to propose the most suitable demand responsive tailored bus routes and bus-stop locations for the unserved demand.

From this analysis, 100 potential new stops have been identified - seventeen with high demand; thirty-three with medium demand; and fifty with low potential demand. The high and medium demand stops define the key points for the setup of new bus routes operated by BusUp (a PT service provider), while the low demand stops are included if they are located along any of the main routes. Having established the core routes, these are then publicized to other festival attendees via the festival website and Twitter account, allowing more attendees to book through the BusUp bus ride-sharing App/platform.

The Canet Rock festival will be held on 6th July 2019 and the effectiveness and satisfaction with the new BusUp bus ride sharing services will be evaluated and results reported in the final paper.

The innovation of information mining from Social Networks can provide a better comprehension of the demand and can radically improve the capacity of bus ride-sharing services, such as BusUp, to offer better tailored services and to better aggregate and serve the demand to large events (>10.000 attendees). BusUp currently serves more than 20 events in the EU and Latin America and the solution could be easily replicated to similar events (music concerts, sporting events, etc) elsewhere.

2.2. Flanders region

In Flanders, INCLUSION project partner Taxistop manages the “Less Mobile Stations service”, which reduces the barriers of participating in social life for less mobile elderly people by providing door-to-door transport. This service operates in 226 municipalities across the region, providing a service to 38,010 members using 2,846 volunteer drivers. Although a very popular service, two main problems exist: 1) attracting and retaining sufficient numbers of volunteer drivers to meet the demand; and 2) the long notice period required to book a trip. At present, users are required to book trips at least 2 days in advance of travel and, similarly, volunteer drivers are required to offer their availability as least 2 days in advance. The resulting services is not very responsive to user demands and, more significantly, rules out volunteers who may only know of their availability to offer their services on the day or night before. To overcome these problems, Taxistop have developed the MobiTwin App which provides the ability for both passengers to request trips and volunteer drivers to offer availability right up to the time of travel. The technology is making an already popular service more responsive to the needs of both passengers and volunteer drivers. For elderly members not able to use an App service, a friend or family member can use the App on their behalf and there remains the option to phone the Less Mobile Stations call center where staff can use the App on behalf of their clients. The MobiTwin App is being tested in two Less Mobile Stations service areas of Ghent, which is largely urban, and Oudenaarde, which is more rural in nature.

Enhanced ICT enabled social innovation features which can potentially be added to the MobiTwin App to further encourage more volunteer drivers will also be investigated. These include the introduction of gamification elements to encourage volunteers to maintain interest and enthusiasm in the service, and a form of dynamic pricing whereby increased rewards are offered to volunteers making themselves available at times of day when demand is greatest, or for agreeing to offer their services for trips which are of greatest social value (e.g. hospital appointments).

The MobiTwin App is being demonstrated from July 2019 and initial results will be available for inclusion in the final paper.

2.2. Budapest

In Budapest the aim of the INCLUSION project is to increase the service level for the people with reduced mobility. To reach this goal, project partner BKK, the public transport authority for the Budapest area, is introducing two connected pilot actions.

The first pilot action involves crowdsourcing information from groups of travelers with additional specific needs: blind and visually impaired, disabled, travelers with luggage or baby buggies, tourists, and foreigners staying in Budapest long-term. The jarokelo.hu webpage and App, which currently allows citizens to report everyday urban problems (i.e. uncollected rubbish, broken paving, pot holes, missing street bin and signs etc.), are being developed to allow these groups of travelers to report problems and issues they experience relating to any aspect of their PT journey. The crowdsourced information is collected, aggregated where relevant, and shared with authorities to act on. This information is also made visible to fellow travelers with common needs in order that they can benefit and learn from other's experiences.

With the use of the public crowdsourcing platform, a new social connection will evolve between the target groups and BKK who will gain a better understanding of the requirements and problems of the people with additional needs. This will then feed into the second pilot action: a new training program for public transport staff which is being developed and piloted in order to contribute to more competent and compassionate staff behavior and therefore a more inclusive environment.

The crowdsourcing app and staff training will be delivered between July 2019 and December 2019. In the longer term, BKK will use the aggregated crowd data to identify the most significant physical barriers and infrastructure problems highlighted to them, and can plan suitable infrastructure or service improvements needed to help raise the level of accessibility, inclusiveness and equity for the entire community.

3. CONCLUSION

The above examples of mobility solutions employing ICT enabled social innovation have been piloted through the summer of 2019 and initial results will be available by the end of October 2019. Final results and full evaluation will be completed by April 2020. A new key publication titled “Typology and description of underlying principles and generalizable lessons” will be made available as of November 2019. The aim of this publication is to help public and private stakeholders with an interest in improving the mobility situation for vulnerable user groups to determine the most suitable types of measure(s) for their context and needs. It is meant to provide inspiration and transferable know-how, based on the INCLUSION's analysis of the 51 case studies, while also building upon the knowledge base done at the beginning of the project concerning the identification of prioritized areas and user's needs.

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