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# **RUMOBIL** – Feasibility of New Public Transport Services in European Rural Areas

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Abstract. Rural areas occupy substantial part of the entire EU's surface area and rural development is an important policy area, covering among others also economic diversification in rural communities. Rural areas are important to the European economy as they provide foodstuffs, raw materials, or places for a wide range of recreational activities. However, some parts of these regions suffer from an ongoing population decline and dynamic aging as well as services of public interest retreat from these areas. This, however, cause enormous challenges for the provision of public services, such as public transport. The high costs of a traditional transport network and low level of demand make investments more difficult and ineffective for stakeholders in the mobility sector. The paper brings information on RUMOBIL project outputs from pilots testing new public transport services in sparsely populated peripheral areas. Results of these pilots were used to prepare recommendations presented in the form of the RUMOBIL Strategy, which provides an insight into already proven good practices and novel solutions.

#### 1. Introduction

Transportation is a central issue for rural communities, complicated also by the great diversity of rural areas. Adequate mobility options is a prerequisite for the development of rural regions. Especially quality public transport (PT) connection between the rural and urban areas is a key factor in preventing major exodus of rural people into urban centres. Solutions to transportation challenges may differ by region, and that require the participation of all relevant stakeholders as well as local communities. It is difficult to find the balance between transportation needs for wider access to transportation in rural areas, and the division of decision-making power, responsibility, and the means of financing transportation improvements. It is necessary to bring new solutions and test their feasibility in different conditions.

The problem of PT in rural areas was examined by many authors. Gray, Shaw & Farrington (2006) proved in their work, that, strong local social capital appears important in conferring mobility on certain social groups, especially those without access to a car [1]. Public transport provision in rural and depopulated areas in the United Kingdom was discussed in [2]. Ranković Plazinić & Jović determined specificities of rural areas which should be taken into consideration in transportation demand management as well as to determine factors affecting the transport service provision in rural areas of the United Kingdom, Norway, France, Japan and Finland. It provided key policy insights for efficient solutions and new ways of organizing services [4]. Report [5] showed the impact of poor public transport on the health and wellbeing of communities and rural economies in UK.

The regional governments of RUMOBIL partners from Italy, Croatia, Germany, Czech Republic, Slovakia, Hungary and Poland are in charge of planning and programming the public transport and

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mobility services at a regional and local level and, accordingly, each regional government designs its own interventions in rural areas, usually in terms of "minimum services". In general, the scope of these entities is to improve the sustainable mobility in the regional territory, optimizing the urban and periurban public transport services through the planning of mobility strategies. RUMOBIL project tested eight innovative solutions in different European regions within a period 2017-2019 with the aim to learn how sparsely populated peripheral areas can be better linked to a primary, secondary or tertiary transport node (access to European and national passenger transport networks). These pilots were experimental trials, short-term projects, which helped partners to learn how a larger-scale project might work in practice, in future, in region. Pilot projects provided platform for the organizations to test measure, prove value and reveal deficiencies before spending a significant amount of time, energy or money on a larger-scale project or new transport infrastructure. RUMOBIL was based on transnational cooperation between public authorities and their transport entities who are confronted with a similar challenge to respond to pressures on regional public transport systems caused by demographic change in peripheral areas. As we can see in figure 1, ageing is the problem in all partner regions. Especially in Szabolcs-Szatmár-Bereg County (Hungary), where people in the group 65+ represent 29 % of total population.



Figure 1. Population group distribution in partner regions [6].

The one of the main aim of the project was also to support regional governments and transport agencies by appropriate strategy to improve public transport in rural areas. The developed RUMOBIL Strategy is a sort of decision support model that proposes a set of general recommendations and verified solutions to reduce the critical issues of the mobility in rural and peripheral areas. The paper summarises outputs of the project.

## 2. Methodology and Pilot actions

RUMOBIL project was structured in three phases: initial, operational, evaluation. The initial phase was the design and planning phase, which allowed partners to analyse data and information of the state-ofthe-art of mobility and transport patterns in the pilot territories and through Europe, Identifying the best practices in the field of mobility in rural and peripheral areas, as well as to prepare the pilot tests, highlighting benefits, needs to be satisfied and critical issues to be reduced. Secondly, the operational phase was started up, detailing the plans for trials, promoting tests and innovation introduced by RUMOBIL and monitoring and tuning the experimentations throughout their entire duration. Consequently, the evaluation phase of RUMOBIL project focused on the quantitative and qualitative evaluation, allowing us to clarify the learning from pilot tests and define the guidelines in Strategy thanks to which we could promote RUMOBIL solution to decision makers and then

amend/enhance/improve the plans and existing strategies in each territory concerning mobility in peripheral areas.

A comprehensive set of indicators was defined to measure outputs against goals of pilots and RUMOBIL project as well. All partners gathered data from their pilot regions with the aim to give an overview on baseline situation in region before and after pilot implementation. Outcomes indicators measured short impacts of a project. Indicators were divided into four groups: geographical, socio-demographical, operational, and economical. Partners also collected qualitative data to measure the level of satisfaction with their pilot measure among passengers (via user survey). Pilots, implemented in the operational phase of the project, were undertaken in three fields of concern:

- New approaches and transport services to link rural areas to national and EU transport;
- Improvement of access points to public transport networks to render offered services more attractive;
- Enhancement of passenger information to promote the use of public transport in rural areas.

Public transport service in rural areas is usually provided by bus operations or demand-response transport. This type of service is the most economical in the low densely populated areas. However, for residents of rural areas, access to public transit still needs to be improved and much more support is needed for these communities.

## 2.1 Thematic trains in Croatia

This pilot focused on the rail line linking peripheral areas of Karlovac County with Karlovac and Zagreb. The main objective of the pilot project was to raise awareness of public transport in Ozalj region and to attract more people to use rail transport. Other specific objectives included enhancement of local economy, especially tourist industry, support for local producers, shopkeepers and cultural organisations by attracting more people to visit Ozalj region. To reach stated targets HŽ Passenger Transport Limited Liability Company prepared a series of thematic trains. In total 37 trains were dispatched on the line Zagreb-Kralovac-Ozalj in period March 2017-March 2018. Each train was connected with special event, out-door activity, or visit of historical or natural places in Ozalj region.



Figure 2. Poster promoting thematic train [6]

When organizing each special train and its content, HŽ PP cooperated with local stakeholders, like municipality of Ozalj, and other 20 stakeholders representing local organisations, and businesses.

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Cooperation with local government was essential. Combining multiple transportation services in one location required creation of local partnerships and agreements among different partners and stakeholders involved. External marketing agency hired was responsible for advertisement in cooperation with marketing department of HŽ PP. Potential passengers were informed by leaflets in trains, posters at railway stations and via social media (figure 2).

## 2.2 Introducing a new minibus service in Germany

Whereas Saxony-Anhalt provides a good main transport network (rail service and interregional bus services), a number of rural/peripheral areas are not adequately connected to the main transport network including Osterburg and Möser. The main objective of the pilot project was to strengthen local public transport in those rural areas and thus contribute to ensuring people's mobility. Improvement was based on "thinking like a passenger" approach with the aim to provide local authorities and citizens with customer support and solution based on a comprehensive understanding of passenger needs, tailored mobility experience.

Ministry for Regional Development and Transport of Saxony-Anhalt with its in-house transport agency NASA aimed at introducing a new minibus service operating according to the demand of residents. A "Citizen Bus" operated by local communities, residents and volunteers represents a highly innovative and cost-effective approach for connecting rural/ peripheral areas. A mini bus with 8 passenger seats is driven by volunteers. Accessibility for people with reduced mobility was ensured by using a low floor bus equipped with a ramp for wheelchairs and rollators (figure 3). In addition, an automatically opening and closing door is useful. GPS transmitters and devices for ticket sales were installed and software was developed to arrange ticket sales and GPS tracking in the bus. This will latter allow an integration of the Citizen busses in real-time information systems. The Citizen Bus implementation was accompanied by a densification of bus stops in each settlement along its routes to shorten the distance between home of passengers and bus stops. In this way number of bus stops in substantially increased in both pilot areas. As this approach is regarded as a trial process, bus stops were equipped simply only installing a bus stop sign and an information plate for bus schedule. This is also to reduce costs in a service trial period.



Figure 3. Citizen Bus vehicle [6]

## 2.3 New bus services in Czech Republic

Hand in hand with present population development and unfavorable demographic prognosis for near future, the Vysočina Region has been struggling with decreasing numbers of passengers using public buses and trains, despite high financial involvement of the region, municipalities and the state. The pilot experimented innovative integrated approach for providing public passenger transport in peripheral

areas. Tested measures combined "standard" existing solutions, designed by the current regional public transport system, with ongoing preparations to launch the future integrated system "Public Transport of Vysočina". Developing such a system will facilitate easy and accessible mobility between rural areas and important regional nodes, where access to the national and European (TEN-T) transport network is available. The pilot bus line connections contributed to improvement of accessibility of rural municipalities and their connection to important nodes of regional or sub-regional importance, that are significant centres of education, employment and various public services for the inhabitants (regional capital Jihlava, cities of Třebíč and Havlíčkův Brod, town of Velké Meziříčí).

Another new pilot bus line introduced by Jikord in South Bohemia was led from the railway station in Kaplice to operate neighbouring municipalities and settlements/solitudes with the destination city of Benešov nad Černou. Pilot bus line connected region with long-distance and regional trains, which have further connections to all directions of the South Bohemian Region and beyond its borders. The line helped to improve the availability of public transport in the area (including weekends and public holidays, especially in places where access was not available). The secondary objective - to allow tourists access to the area - has been fulfilled successfully. Despite the short test period of the pilot line, which covered the tourist season for only 3 months, there was a considerable interest of both individual tourists and organized groups (senior clubs, tourist clubs, scouts and campsites, but also schools that used the bus for a school trips). Introducing of new bus lines was accompanied by publicity campaign (figure 4).



Figure 4. Promotional poster [6]

## 2.4 Rural intermodal node in Slovakia

Several aspects were taken into account under this field of concern. Intermodality, comfort and information. Intermodal travelling is perceived as a solution to the many transport problems and plays also an important role by enabling better mobility for the travellers in rural regions as combining different modes (including non-motorised) of transport in a seamless travel experience. Demand for

intermodal travel is growing and it has also led regional transport administrations to rethink how they can maximise the effectiveness of their networks. One option is to improve linkages with other transport modes. This concept was tested in Rajecké Teplice by Žilina self-governing region, where rural intermodal point – railway and bus station were equipped with new technologies and improvements including monitoring panels informing about departures and arrivals of public transport lines, barrier-free access from bus to railway station, safe bike box, wifi, new parking places for cars, renovated bus stops, or CCTV camera (figure 5).



Figure 5. New safe box for bicycles with benches for passengers [6]

## 2.5 Enhanced bus stops in Hungary

Another pilot addressed bus stops in Szabolcs-Szatmár-Bereg County and Municipality of Nagykálló. Except physical reconstruction of shelters several enhancements were performed including digital passenger information boards for passengers to provide real-time information collected via GPS from buses. WiFi accessibility can also contribute to public inclusion and increasing of bus-stops attractiveness (figure 6).



Figure 6. New bus stop in Nagykálló [6]

## 2.6 Mobile app for DTR service in Italy

The DRT (demand responsive transport) service Prontobus is performed from the public transport operator for the Province of Modena aMo for travels within the area of Castelfranco Emilia. Before RUMOBIL intervention the service was available with reservations that could be made only through a call center. The call center handled reservations manually and no information about service was provided to users. The lack of information about the provision of the DRT service has been highlighted by users – through a phone survey - as one of the main difficulties in accessing it. Main pilot objective was to significantly improve information and accessibility to the DRT service (that was actually underused compared to its potential) by implementing a new software application connected to a web

portal specifically dedicated to the information about DRT services. The system consists of web portal for the users of the Prontobus service with information about the situation of reservations updated in real time with the possibility to register in order to receive e-mails or SMS about interesting services recognized for the day after; site dedicated to the management of reservations for the call center; app for users of the Prontobus service to view reservations updated in real time and with the ability to book an existing trips directly from the app; app for drivers of the Prontobus service to get information about reservation in real time and the trips to be made (figure 7).



Figure 7. – Web portal for users, App for drivers on buses [6]

## 2.7 Live train status and departure information in Poland

Mazowieckie voivodship implemented new information system in the North-western part of Mazovia at two railway lines, Nasielsk – Sierpc, and Sierpc – Kutno. The aim of the pilot project was to increase the number of train passengers in the target area by implementation of the new real-time passenger information system. To reach this goal, several measures were implemented, that allow passengers to plan their trips more effectively including installation of GPS transmitters to trains, app for mobile phones (figure 8), and interactive kiosks at railway stations.



Figure 8. Log map of the "tropKM" application in pilot target area, mobile app screenshots [6]

### 2.8 Results and lessons learned

A common set of monitoring indicators was defined by partner – the University of Zilina to assess the success of the pilots in each region as well as through a comparable approach among partners. The learning from the pilots was transferred to the RUMOBIL Strategy. Deliverable D.T1.6.1 - Work paper summarised learning from RUMOBIL pilots was used for arguments for partners for the formulation of draft decisions. Pilots were also evaluated from economical point of view. In all partner regions there



was an increase of public transport service usage recorded in target area after pilots implementation (figure 9).

Figure 9. Number of passengers in partner regions [7]

Figure 9 represents difference between number of passengers before and after pilot implementation. Some partners did not provide data until the end of project. The highest growth was in Vysočina region, where pilot project tested new bus lines for new regional transport plan. On the basis of data from partners we can consider all pilots as successful. During RUMOBIL project some lessons were learned that will benefit partners as well as all other potential future replicators of new PT solutions. These lessons learned are presented as high-level information from RUMOBIL project perspective.

**Transportation planning, PT offer and local development**. Carrying out effective public transport in rural areas requires an optimal regional institutional arrangement for transportation planning and also for decision making. A future-oriented public transport for rural areas has consider demographic trends, socio-economic changes and the diversity of users and provides tailored offers. To ensure that it is necessary to assess customer expectations, and align them with service capabilities. In this way PT supports the provision of equal living conditions in rural areas Improved public transport between urban and rural areas help to develop local economies, contribute to the growth of business and integrate the rural environment into the mainstream economy. Good public transport service offered by operators can, with the help of local government, create a content by employing local people and different stakeholders, promoting heritage, sights and natural beauties. With people coming, local population has a reason to stay in rural area and provide contents [6].

**Integration and coordination.** The availability of public transportation, and especially, the better management of routes and the establishment of integrated systems in public transportation contribute to the change of many negative trends of the rural areas. The aim of integrated transport systems is to provide residents with a high quality, easily accessible transport network across a whole region. Travellers should be able to move using different modes of transport - such as rail, bus service, cars, on demand service, bicycles and even foots. The network should have a unified tariff and payment system.

Connections should be easy to reach, resulting in fewer transfers, reasonable costs, a reliable service, and convenient travel times [6].

**Flexible transport systems.** Flexible transport systems bring a promising approach to improving the efficiency and performance of passenger transportation services in rural areas. They provide passengers with flexibility in choosing routes, times, modes of transport, service provider or payment systems. The flexibility is based on integration of different modes of transport, or possibly spanning multiple service providers. Service is more sophisticated, comfortable and cost-effective. This concept is especially suitable within rural areas, which usually suffer from lack of service availability and demand uncertainties. Flexible transport systems could be integrated to an existing PT services and aim to support it reaching low density areas [6].

**Spatial densification of stops/stations.** The proximity of homes or target destinations to public transport networks is a key factor supporting usage of public transport. One of the most frequent strategies for increasing proximity to public transport is to densify the stops. Both the location and the spacing of bus stops significantly affect service performance and passenger satisfaction as they influence travel time [6].

An appealing design and the consideration of comfortableness. Respecting results of qualitative surveys performed among passengers in partners' regions, comfort is an important factor in residents' choice of traffic mode. Thus, improving comfort in vehicles and at bus stops and stations to attract more passengers received much attention from PT service operators and authorities in some partner regions. A good bus shelter – a waiting area for passengers - is an essential part of any successful PT bus service system. From the passenger's point of view, an ideal shelter is one that allows an easy access to the bus, is comfortable and convenient, and provides accurate information [6].

**Information and infomobility tools.** New infomobility tools are probably the ones more considered in the last years. Measures concern a lot of fields, all important to make a service more attractive and, above all, simple. Many of them refer to the real-time information that can really improve the quality of a service. Other actions focus on helping people to plan their trips, to make decisions, or to manage booking services and ticket buying. They save time and prevent troubles during the trip [6].

**Participation of stakeholders.** Citizens and stakeholders' involvement is a precondition for any mobility intervention, since long-term perspective of measure requires a high degree of support and acceptance. The main project beneficiaries are the groups of residents who were awaiting the arrival of a better transportation system and services in the region. Besides residents there can be other types of beneficiaries, e.g. tourists or specific groups of residents, e.g. elderly people or youth. The stakeholder identification process is one of the most important processes in each project management, because projects are undertaken to fulfil the requirements of stakeholders [6].

**Promotion campaigns.** To raise awareness on sustainable mobility among people in rural regions, various techniques may be used, such as designated educational programs, seminars, meetings, or different types of publicity campaigns. The production of a successful sustainable mobility campaign is a complex task and requires an understanding of the general needs of those affected. The aim of the campaign is to inform residents about the measure and its advantages as well as to test new measure and get feedback from the public. The campaigns promote public transport as a high-quality alternative to individual car transport among all target groups and highlighted main advantages of the new measure.

Appropriate evaluation methods and tools. Assessing the impact of measures and their feasibility is an essential part of mobility or transport planning. Monitoring and evaluation activities deliver data about the progress of measures and the impact of measures. Monitoring activities should be carry out before, during and after implementation of intervention measures. They provide information to planners and decision makers that allow a timely identification of problems, potential successes and need for readjustment of plans [6].

#### 3. Conclusions

The big amount of people living in European rural areas are faced with transport constraints. There are real obstacles to mobility, even for the most everyday journeys. Car is very often the only possible mean

of transport, but owning a car and using a car is expensive or impossible for some people, who are sometimes in a fragile financial, or health position, not to mention the environmental aspect of individual car transport. Very often rural families dedicate twice as much of their budget to transport as the rest of the country. In some low-income rural areas, this expense can account substantial part of a family's budget. Big cities, towns and sparsely populated regions have increasingly unequal access to mobility.

It is not possible to replicate some solutions proposed for PT in cities in the countryside. The cost per person of making a bus ride from village to village or to higher level transport node is much higher for local authorities, both financially and in terms of CO<sup>2</sup> emissions. New innovative solutions are needed. RUMOBIL partners tested such solutions in their regions. Each pilot was unique regarding a mode of transport, target area size, features, functionality or novelty to be deployed.

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