

INFOMOBILITY AS SOLUTION TO PROBLEMS OF MOBILITY AND TRANSPORT IN RURAL AREAS

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ABSTRACT

It is known that the inhabitants of rural areas are facing the problem of mobility. Infomobility can help in solving this problem; it refers to the procedures, systems and devices based on the intelligent transport systems (ITS) and services that enhance the mobility of people through the collection, processing and distribution of information. Infomobility services may have an impact on different groups of users, such as passengers, municipalities, transport operators and fleet managers. It can be said that they generate benefits for each of these groups. However, in many regions these services are not always used in the optimum way. The answer to this problem is the POLITE project, the goal of which is to share good practice between regions with more experience and regions which are willing to accept the support and want to use infomobility services. In this paper the authors present the best practices with infomobility potential, which give an excellent example of how you can cope with the problem of mobility in rural areas. The best practice is a demand responsive transport system, which is successfully implemented in Krakow low urbanized areas.

In order to better customize PT offer to citizens' needs, the city of Cracow has introduced and tested a new demand-responsive transport service in a chosen area of three districts. The DRT service, called Tele-Bus, was launched in Cracow after the transfer of technology and know-how from Genoa. DRT is a "many to many" public transport service with fixed stop points and flexible routes and timetables. It operates every day in the south-eastern part of the city and during defined operating hours. The main objective of demand-responsive transport (DRT) in Cracow is to better serve passengers by supplying better personalized service that could be in tune with their actual needs regarding journey time and destination. An important assumption is the lack of significant costs generation associated with the service launch and day-by-day operation. DRT clients just contact dispatchers by phone using a special free line dedicated only for that service. Dispatchers collect information from passengers and introduce the data into the system, which plans the routes; output information is given to tele-buses. The only limitation from the passengers' point of view is the fact that an order must be placed at least 30 minutes before the planned start of the trip.

The article presents the characteristics of infomobility services, the POLITE project, as well as best practice in the area of infomobility.

1 INTRODUCTION

The abbreviation DRT refers to the term of the demand responsive transport. In Poland there is only one solution of that kind in Cracow, defined as "a tele-bus" or "a dial-a-bus service". The DRT solution is so little known that it requires clarification, popularization and

finally also implementation. Urban or suburban areas around Polish conurbations seem to be an excellent scene for action for officials, who are often following an innovative approach, given that in many European regions a huge number of similar transport solutions have been successfully implemented and used. Therefore, there is no impediment to the implementation of similar solutions in rural areas, especially in those with quite high level and size of population, justifying such implementation. The DRT system has been described under the POLITE project²² as one of good practices, which can be transferred further.

2 The POLITE project

In recent years public transport companies have been developing their offer not only through the improvement of the quality of their services, but also through the enhancement of availability and attractiveness of their offer. Convincing the inhabitants of a conurbation to collective transport is becoming a key question to road traffic. The attempts at moving passenger streams from cars to public transport, aimed at reducing congestion, require activity of public transport companies and support of public benefit organizations. The POLITE project, which is one of the EU projects implemented by the Institute of Logistics and Warehousing, is concerned with offering support to such measures.

POLITE is an acronym of the full name of the project, i.e. Policy Learning in Information Technologies for Public Transport Enhancement. Although the term POLITE can be associated with the Greek word meaning the city/town, the project is concerned with all areas of operation of public transport, including cities and towns, the suburbs or typically rural areas. Moreover, the objective of the project is popularisation of solutions related to the integration of many means of transport, with special emphasis on solutions in the area of infomobility.

One of the basic objectives of the project is the improvement of use and attractiveness of public transport. This task should be achieved through the facilitation of transfer of solutions in the area of infomobility, i.e. through the improvement and popularisation of direct access to interactive sources of information for passengers, both present and potential ones. The examples of promoted solutions include improvement of information, comfort of travelling, the possibility of on-going planning of optimum connections, or purchase of tickets through electronic channels.

Yet another objective of the POLITE project is the promotion of co-modality of public transport. The passenger is also the focus of interest under this objective. Synchronization of travel frequency, based on the studies of passengers' needs, leads not only to the improvement of users' satisfaction, but also to optimum use of transport infrastructure.

The collection of information on good practices will enable the provision of ready solutions to public administration employees, which can be quickly transferred to their own local or regional area. After developing analyses of requirements of a given region, these solutions will be adapted to any identified requirement, as long as appropriate solutions can be provided by the partners of solution "donors".

Even if identified good practices are not directly compatible with the requirements, possibilities or character of regional needs of "the recipients" of practices, the knowledge of such practices will enable improvement of awareness of possibilities available to public administration and public transport, thus becoming the basis for the strategy and long-term development perspectives.

²² More information on the project is available on the website: www.polite-project.eu

The main result of the POLITE project will be a horizontal or vertical transfer of selected good practices between the regions of project participants (see Figure 1). The last task under the project consists in the development of implementation plans of selected good practices in the regions with lower culture of public transport.



Figure 1: Partners of POLITE project [1]

2.1 Good practices

How are good practices understood under the POLITE project? In compliance with the definition from the dictionary of INTERREG IVC scheme, a good practice is defined as *an initiative (e.g. methodologies, projects, processes, and techniques) undertaken in one of the programme's thematic priorities which has already proved successful and which has the potential to be transferred to a different geographic area. Proved successful is where the good practice has already provided tangible and measurable results in achieving a specific objective* [2]. This definition applies to good practices, i.e. the measures which are quite popular and usually present in more than one region. The hierarchic arrangement of good practices is possible, under which the best practice will be the top one. For the requirements of the POLITE project, the definition of the best practice of ERDF fund has been used: *“Best practice – a way, technique, methodology, innovative practice that, through experience and*

*research, has proven to reliably lead to a desired result and is considered to **be superior to all other known**. It contributes to the improved performance of an organisation, usually recognised as “best” by other peer organisations.”*

2.2 Infomobility

The project places special emphasis on infomobile services, i.e. services related to the collection, processing and dissemination of transport-related information using intelligent transport systems (ITS). Appropriately prepared and disseminated data shall provide information on available means of transport to commuters, both before and during the journey.

POLITE focuses on good and best practices related to IT technologies, which are used for the needs of public transport under the operator-passenger relation. Any other practices not related to IT can also be identified and disseminated, especially if they co-exist together with other best or good practices. An example of good practice not related with IT is the designation of public transport vehicles with colours, with the aim of facilitating and improving the process of identification of appropriate public transport lines.

3 Rural areas demand response transport

DRT, which in the article is called demand-responsive (public) transport, is a form of public transport the daily operation of which is determined by the needs of its users. Under one of the versions of the Niches [3] project, demand-responsive transport was defined as “the advanced, user-oriented form of public transport, characterised by flexible routes and variable timetable of small or medium-sized buses, operating between bus stops in compliance with current passenger needs”. Figure 1 presents the location of demand-responsive transport among other means of urban transport.

The operation of the system is quite simple - a potential passenger contacts the control centre of DRT traffic by phone and passes information concerning the planned starting and end site of journey, the number of persons and the time at which he intends to start the journey. Optionally, the passenger may also define the time at which he intends to reach the destination. The operator controls the status of orders placed for a given time on the on-going basis as well as the occupation of vehicles, and he plans the bus route with the support of optimization systems. On the basis of these data the operator informs the passenger of the time at which he should be present at a given bus stop. The passenger confirms the receipt of information and all he has to do is to wait for the arrival of the bus at the specified time.

Transport Categories Relationship and Apply Examples

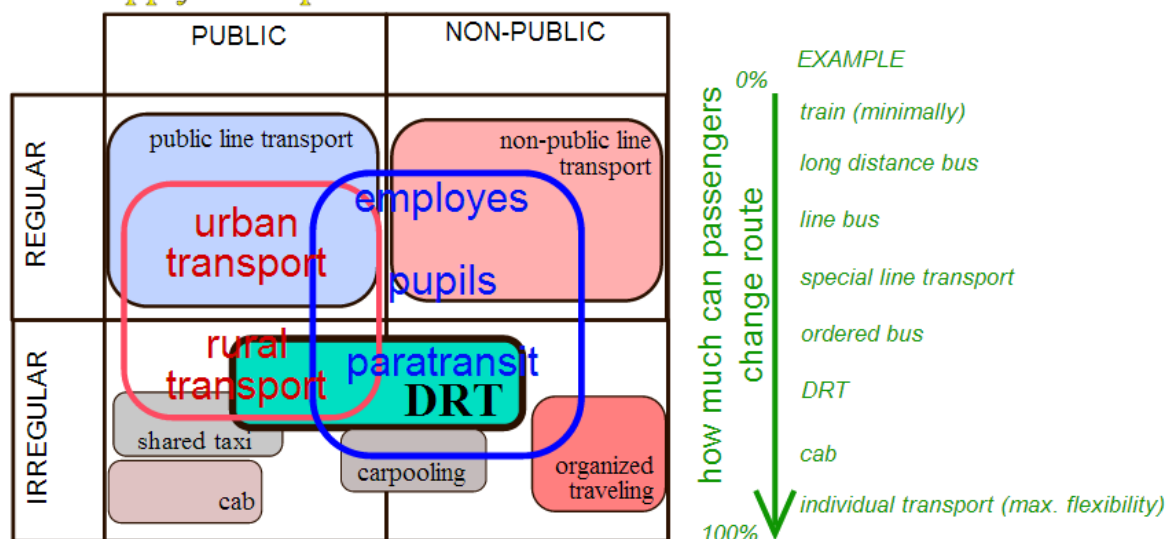


Fig.2: Rural transport and DTR on the background of others means of transport [4]

When deciding to use demand-responsive transport, the passenger does not know the exact bus route. He has to be prepared for a slightly longer (during rush hours) or shorter journey time in relation to the timetable of operating transport, depending on the number and location of transport bookings.

The task of the operator, apart from the on-going rationalization of transport routes, consists in the transmission, in an electronic and wireless manner, of any planned points of the route to the driver's interface. This interface, which is equipped with the location system, plans future routes or, if it is still possible, modifies the present route. The driver, on the other hand, shall follow the planned and optimized route, stopping at all bus stops in compliance with the indications of the interface installed in the bus.

The main advantage of demand-responsive transport is the improvement of access to public transport in the areas or at times when conventional services cannot be offered for various reasons on the level which is satisfactory to passengers. Furthermore, DRT solutions effectively prevent social exclusion of persons who do not possess their own means of transport, and who live in the area with quite low degree of urbanization, e.g. in rural areas. The success of demand-responsive transport solution, which has been popularised through word-of-mouth marketing or promotional campaigns of the operator, can be a convincing argument for changing a private car for a means of public transport. The data from actual implementations demonstrate a successive increase in persons using this kind of public transport.

Demand-responsive transport solutions usually enable reduction of public transport costs (in relation to the timetable-based solutions) in the areas of implementation with medium and low public transport demand (suburban, rural, and low-urbanized areas). Dedicated routes, smaller and flexibly selected buses (depending on availability) as well as the adaptation of the intensity of traffic to the size of the stream are only some of the factors which lead to savings and reduction of exhaust gases. The introduction of DRT is usually related with the increase in the scope of operation of public transport, too.

However, it is necessary to incur initial costs, which consist in the expenses for the optimization system, equipping the vehicles, the communication system, the modification of traffic control centre and other similar expenses. The costs of additional infrastructure and the costs related to employing the staff of traffic control centre are considered the running costs. An important outlay, which is often not taken into account, is the financing of campaigns aimed at popularisation of the new transport solution. Implementations usually have to be supported with public funds and, as in the majority of public transport cases, they have to receive subsidies during operation.

The most important factor of implementation, however, is passengers' satisfaction. After the initial adaptation period or the period of getting accustomed to the change, passengers praise the novel solution and they literally "vote with their legs" by changing the currently used means of transport for demand-responsive transport, which is confirmed by the example of the increase in the number of passengers during the first four years of DRT system operation in Florence (figure 3).

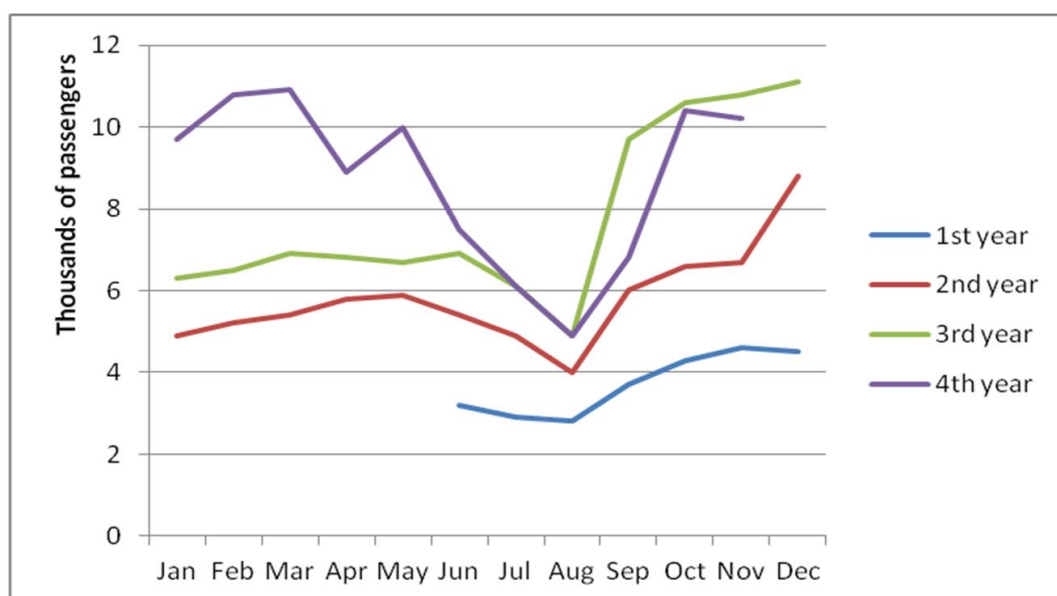


Fig.2: The increase in the number of passengers in the first 4 years of DRT system operation in Florence [5]

DRT solutions are not restricted only to public and urban transport. Solutions of a similar nature are often used in the airports, thus filling in the gap between transport operating according to the schedule and taxis.

Demand-responsive transport solutions can be transferred quite easily. The transfer of knowledge should be understood as the transmission of ordered and interpreted bundles of information, which does not have to be strictly technical: it can be e.g. economical knowledge or the knowledge in the area of logistics or marketing" [6]. The existing demand-responsive transport solutions can be exemplary solutions, i.e. the best practice ready to be implemented in another location with similar characteristics in the area of transport demand. Thus Telebus in Cracow started to operate, since it was created as an element of the EU project entitled Civitas Caravel, on the basis of experience of Italian partners under the project, who had implemented the model solution a few years before in Genoa. This is the only DRT system operating in Poland at present [7]. It should be stressed that the fare system in the telebus is the same one as in the whole public transport in Cracow, and it also includes the system of fare discounts.

The principles of operation of Tele-bus in Cracow stress one of the main defects of demand-responsive transport - passengers who have not booked their journey by phone can receive the service only if there are available seats on the bus and on the approved route which the bus follows. This defect can be reduced by the use of mobile applications, informing on the potential passengers on the on-going basis of possible travel options.

This currently developing state-of-the-art mobile technology can significantly facilitate access to demand-responsive transport. Many urban buses have already been equipped with location systems and many control centres dispose of current information of the location of their vehicles. Making this information available on internet platforms and transferring it further to mobile phone screens, tablets or city monitors is only a question of time. The transport can also be ordered on-line in the future, which will take the part of the load from the operators of control centres. Mobile technology seems to exactly match the needs of demand-responsive transport and it can become the source of its further development in the nearest future.

4 CONCLUSIONS

The POLITE project offers the possibility of transfer of publicly available knowledge from one place to another, from the Cities of Good Practices to Transfer Cities. It should be added that the POLITE project will also involve the initiation of co-operation with other regions outside the partnership with the view to enhancement of awareness of the existing infomobile solutions in Europe. This is an excellent opportunity for the cities in which infomobile services are not well developed to catch up in this area. Appropriately developed infomobile systems make public transport more attractive to passengers. The cities (the Managing Bodies of Public Transport) are the main beneficiaries of the implementation of this solution. The benefits mainly consist in more effective and efficient management of public transport.

One of the good practices identified under the POLITE project as DRT solutions based on telephone communication and operators that introduce the data manually has survived successfully for the number of years. State-of-the-art technologies, which provide systemic support to demand-responsive public transport, offer the possibilities of computerisation of both ordering passenger transport and route planning or organization. Such infomobile solution can help in further development of DRT and its successful implementations. The benefits of other solutions in the area of infomobility in the areas with low intensity of public transport-related infrastructure should also be taken into account.

The Cracow example is one of the sources that can serve as a good practice which can be transferred readily. The statement that there are no areas with appropriate level of population and urbanization, where such innovations can be introduced, is also not true. The only reasons for the lack of DRT solutions in rural areas can be the lack of appropriately disseminated knowledge on the benefits of demand-responsive transport and the unwillingness to try new solutions that have not been proved in the existing conditions, which, however, cannot be any justification for the lack of attempts in the area of implementation of demand-responsive transport. It is worth changing this situation.

There are many ideas and initiatives formed on their basis, but the main factor of effective transfer of good practices is the consequence in their implementation and on-going consultations with the stakeholders - representatives of public transport and inhabitants [8].

Acknowledgements



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