

*Proceedings of the 13th International Conference “Reliability and Statistics in Transportation and Communication” (RelStat’13), 16–19 October 2013, Riga, Latvia, p. 83–90. ISBN 978-9984-818-58-0
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KEY SUCCESS FACTORS OF INTEGRATED TRANSPORT SYSTEMS

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The article deals with the key success factors of integrated transport system (ITS) from the passenger’s point of view, what is the most important for passenger’s decision to choose the public passenger transport, how the services of integrated transport system can be competitive with an individual automobile transport. The article will define the key factors of successful integrated transport system. The solutions will be implemented in the region of Slovakia and it will be pointed out which problems have been identified in the conditions of preparing integrated transport system in Slovakia. The conditions will be compared with the conditions in other countries in which unlike Slovakia the integrated transport systems are successfully operated. Also there will be suggested the mechanisms how the process of integration should be realized in the conditions of Slovakia.

Keywords: access of public transport, financing, tariff integration, time and space coordination, marketing

1. The Integration of Public Transport

Generally it can be said that the integration is required in the case when some system is composed of several parts and elements and the aim of integration is to increase the work efficiency of these elements by their complementarily. The integration can be realized as the physical, operating and managerial. In terms of public passenger transport the integration is understood as the integration of different transport modes which are operating on the different transport networks on which various providers of public passenger transport provide services.

In terms of subjects who are involved in the integrated transport systems the main three interest groups are identified:

- providers of public passenger transport – they have to be willing to provide the interconnection of their systems in terms of transport, economic, organizational and tariff;
- users of public passenger transport – it can be said they are the decision-makers, they create the demand and they decide about the success of transport system by their behaviour,
- authorities, who order the performances – the public service obligations – they create the legislative framework how the integrated transport system should be operated, they transform the requirements from inhabitants to the operators.

In the pre-integration phase the agreement of the providers and authorities is the key issue. These authorities have to agree on the future of preparing and operating of integrated transport system. In this document the framework steps should be included and also the timetable of each of steps. It is important that the coordination group should be created from the all involved subjects as the base for future coordinator of ITS.

From this point of view the integrated transport can be defined as the organisational process through which the planning and other system element are associated regardless of the transport mod, providers and institutions with the aim to increase economical and social benefits. But more and more another benefit is considered – the impact on the environment.

This process of integration brings together the different subjects, their different approaches, aims, intentions and also their fears and barriers. The barriers of institutional integrated were identified as following:

Table 1. Institutional barriers of public transport integration [1]

Institutional barriers	Overcoming those barriers requires
Split or duplicated responsibility	More coordination between the tiers of government, and between agencies at each level
Process	Consistency in planning over the long term
Identifying objectives, specifying problems, selecting possible solutions, appraisal, implementation	A problem-led approach to developing solutions and strategies
Political and public acceptability	Political champions and more positive involvement of the public and media
Information and skills	More effective use of data, models and appraisal methods
Financial	Financial support for strategies, without inducing policy bias
Legislative and regulatory	Legislation and regulations to support these requirements

For operators involved in the integrated transport system the key issue is to provide integration in the following fields:

Transport integration – means the coordination and optimising of timetables and line tracing between operators, building and operation of transfer terminals including the controlled follow-ups of individual automobile transport and also walking and cycling. This means the transfer between different transport modes is provided and the passengers do not have to wait or wait too long for another line and their time loss are minimizing. It includes also the space coordination – the safe and comfort transfer nodes. All these measures have the main aim – to decrease time of journey from the origin to the destination.

Organizational-economical integration – the main part of this integration is to manage and realize financial flows between the involved subjects. It means mainly the dividing the revenues from fares and subsidy flows to cover the costs which are not covered by revenues.

Also this integration includes the activities as the planning and designing the future conceptions, development plans, agreements between all the involved subjects, information system, controlling, and other related activities. One activity has to be mentioned – promotion of integrated transport system and the services it offers to passengers.

Tariff integration – it includes the creating of unit tariff system which is comprehensible to passengers. The area of integrated transport system is divided into to regular or irregular zones, the tariff is created in accordance to tariff structure, and the range of ticket is created for regular and irregular passengers. The tariff and transport conditions are united too. It included also the selling and checking system.

As it can be seen (Figure 1) the process of integration includes many partial steps and each of these steps can contribute differently to the success of integrated transport system. On the base of years of experiences of integrated transport systems operated in many European countries the key success factors can be identified – range and quality of services, advantageous fares and comprehensible tariff system and promotion. All these parts influences each other, it is not possible to consider the success of integrated transport system without

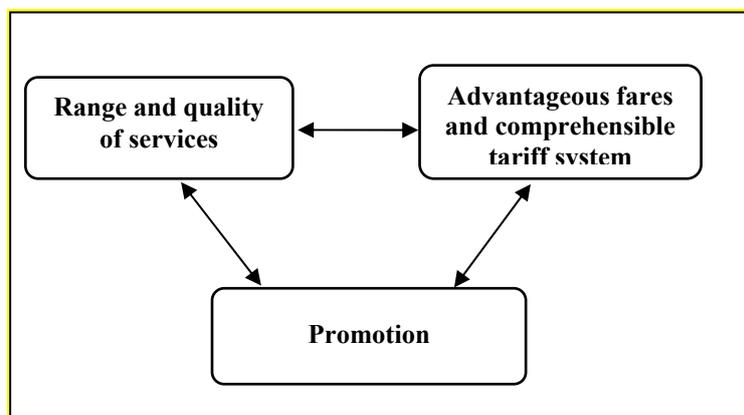


Figure 1. The key factors of ITS success and their interconnection

2. The Range and Quality of Services

The range and quality of services is a large term. Generally it can be said that the most important is to provide the sufficient number of connections and minimize the time of journey for providing the public transport competitive to individual transport.

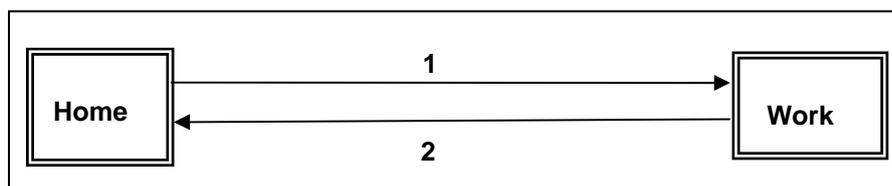


Figure 2. The journeys of individual automobile transport user
 1-waiting time = 0 min, journey = 15 min, 2 - waiting time = 0 min, journey = 15 min
Total time = 30 min

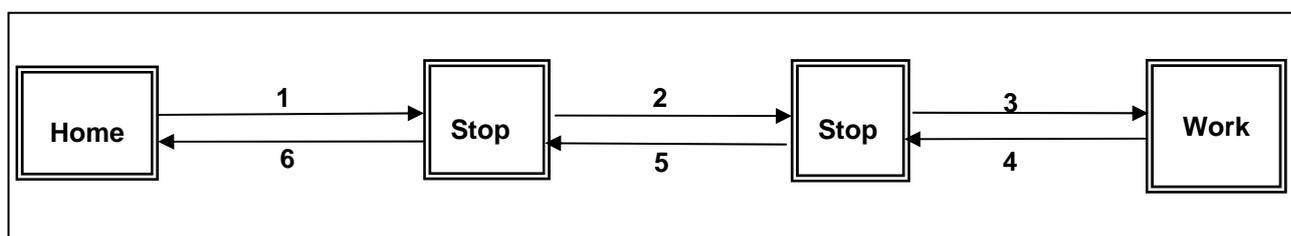


Figure 3. Journeys of public passenger transport user
 1-walking from home to stop – 5 min, waiting time = 5 min, 2 – journey by bus/train journey = 15 min, 3-walking to work = 5 min,
 4 – walking from work to stop = 5 min, 5 – journey by bus/train = 15 min, 6 - walking to home = 5 min
Total time = 65 min

As it can be seen on Figure x and y it is very difficult to provide the competitiveness of public transport to individual transport. Of course it has to be considered that the journey by car can be complicated mainly by the congestions or problem with parking.

The time barriers which can be perceived by passengers or inhabitants generally are eliminated by making the space and time coordination between all transports modes involved in the integrated transport system. The united timetable is the base of transport coordination

Another important part of coordination is to provide the space coordination between users of individual automobile transport and bicycles. Also these users can be the users of integrated transport system when they have the conditions to park their automobile or bicycle. For example, Park and Ride or Kiss and Ride systems are the well-established way how to support people to use public transport for longer journeys or journeys to the city centres.



Figure 4. Integration of individual automobile and bicycle and public transport [8]

Especially the access to terminals of integrated transport systems by bicycle or walking is very important. The way of passenger who uses the public transport has to be considered as the complex unit one journey from door to door as it is said about individual automobile transport. From this point of view it is more clear that all the parts of this journey has to be provided with aim to minimize waiting time, access time to the system of public transport and of course the ride time.

3. Advantageous Fares and Comprehensible Tariff System

It can be said that the advantageous price of tickets is one of the most important benefits for passengers when the integrated transport system is operated. The level of advantageous prices results from the fact if the passenger is regular and how often he uses the ITS.

The regular passengers are those who use integrated transport system for their regular everyday journeys to work, school etc. so they are mostly the pupils, students, commuters. The season tickets are suitable for these passengers. The prices of ticket are more advantageous when the ticket is valid for longer term. It is the so called horizontal digression. Also the vertical digression is used when the price of ticket is more advantageous when the passenger travels to the longer distance. But considering the dividing of passengers on regular and irregular this digression is not useful.

The most European integrated transport systems offer special tickets when they realize that also the regular passengers can be different respectively their journeys and the reason for their journeys are different. For example, for passengers, who commute to work after the 9 hour there is the offer of special season tickets with the price more advantageous price compared to basic season tickets. It can be considered that these passengers are rewarded by lower price because they use the system off-peak. The non-personified tickets are another example how to make tickets advantageous for the family members. This type of ticket can be used by any person from for example the family so they are portable.

The irregular passengers are the second important group of passengers for integrated transport system. They can be divided into the inhabitants of the city or region who do not use the ITS for some reason, and the visitors, tourists or another passengers.

The first group – inhabitants who do not use the ITS regularly - they are for example the commuters or pupils or students who do not have to use the public or any transport because of short journey to work or school but they use ITS for other journeys in their leisure time. Also pensioners or seniors can be considered in this group because they do not have to commute every day to work but they use ITS for their journeys to the malls or visits of family, doctors etc. It depends on the approach of each ITS how these range of tickets for these passengers will be and if and how much they will be advantageous. Sometimes these passengers are dependent on the basic tickets or day ticket or the ticket for more journeys. But in most of European integrated transport systems they try to support these passengers by some interesting ticket offers considering the fact that they can change into the regular passengers later. In all ITS the seniors have the special tickets for them. They support the mobility of seniors in the city or region. For pupils or students the special leisure tickets exist. They are intended for pupils or students who do not have to travel to school but they have to travel to another activities as sport and other school or non-school activities in their leisure time.

The second group – visitors, tourists – usually the day, 3-day or week tickets are intended for this group of passengers. Another type of tickets it is so called “city tickets” or different name of tickets which makes available to combine the travelling by ITS with visiting of historical, cultural, sport or other events or places. The visitor of city or region do not have to think about which tickets can use for travelling by different transport modes or where to buy the tickets for visiting e.g. museum. This ticket supports the visitors to visit as much places as they can and so it is the support of tourism. The group and family tickets can be included.

As it can be seen the range of tickets in integrated transport system is usually very wide because of tickets for different passengers. With combination with tariff structure and possibility of using all the transport modes the passengers can be confused which ticket for their journeys is the best and if it is suitable with regard to time and space use. So the passengers –regardless if they are regular or irregular – have to be informed by the most convenient way – as easy as possible – about their possibilities. They should get the simple instructions for choosing the right tickets.

4. Marketing, Promotion of Integrated Transport System

The promotion of integrated transport system can be divided into two ways:

1. The subjects of service – the journey – following things can be promoted:
 - information about the possibilities to use public passenger transport for regular or irregular journeys – to school, work, for cultural, sport events, visits,

- possibilities how to get the information (offline or online) about the departures, searching of journeys, lines, timetables.
2. The price and the tickets – this is the area when the promotion of ITS is based on the dividing of passengers as it was mentioned in the third chapter. The promotion is focused on the possibility of using different types of tickets for different groups of passengers regarding the purpose of the journey. For example in the term of beginning of the new school year the information about all the possibilities for pupils and students for using ITS with special season tickets was the main line for promotion. For regular passengers the promotion of year season tickets (the so-called subscription) is advanced. The passengers are informed about the advantage of such a ticket – the time validation for one year, the price as for only 10 months).



Figure 5. The part of TV spot promoting the year ticket of ITS Salzburg [9]

Except the price of tickets also other advantages are promoted as that it is portable, non-personalized, the possibility of refunding, the cost saving compared to the using of individual automobile transport.

Also the promotion of time saving by using the tickets without any time and space limits is focused on the visitors. It includes the multi-day tickets, tourist tickets, or the special tickets with the possibility for visiting the cultural and sport events, fairs and other possibilities.

Another interesting way how to promote the services of integrated transport system is to refer to positive impact on the environment. They use the tables on their websites when the passenger could enter the basic information about their journey and it calculates usually the costs and the emissions by using the ITS and by using the automobile.

 ZUR ARBEIT MIT DEM AUTO	VS	 ÖFFENTLICH ZUR ARBEIT
<small>Jährliche Kosten</small> 584,7 €	<small>ERSPARNIS</small> 147,7 €	<small>Jährliche Kosten</small> 437 €
<small>Jährlicher Benzinverbrauch/Person</small> 84,096 lt	49,5 lt	<small>Jährlicher Benzinverbrauch/Person</small> 34,56 lt
<small>Jährliche CO₂-Emissionen/Person</small> 184,5 kg	99,8 kg	<small>Jährliche CO₂-Emissionen/Person</small> 84,7 kg

Figure 6. The example of comparison of costs and emissions between automobile transport and public transport in ITS Salzburg [9]

5. The Problematic Conditions for Integration in Slovakia and Their Solutions

The basic problem of integrated transport systems in Slovakia is that the relevant legislation does not exist. The integrated transport systems are mentioned only in the Act about Road transport and railway transport as the short definition:

“The region or municipality supports the creation of integrated transport system in passenger transport. Integrated transport system means the connection of railway transport services with urban transport system and suburban bus transport into the one system of lines in the way that it brings the advantages of unified tariff, transport conditions and unified transport documents.”

The similar new passage containing the support for integrated transport systems is included in the act for railway transport:

“Integrated transport system means the connection of railway transport services with the system of urban transport and suburban bus transport into the one system in which the lines are interconnected and the connections are harmonized. This is based on unified time-table. Ticket sell system is unified as well. Integrated transport system has to be able to perform the journeys on the interconnected lines with only one transport document.”

It appears from the above-mentioned that for now there is only the basic support defined in the legislation and the involved subjects – operators and authorities are not forced to be involved in the creating of integrated transport system. Also more detailed elaboration of each part of integration, the process of integration, the conditions for all involved parts are absent in the both acts. When the authorities and operators decide to create the integrated transport system they do not have any basic instructions how to continue, what is important, what they have to prepare, plan, when the coordinator should be established and with which responsibilities in each phase of planning and operating.

The coordinator should have the responsibilities for:

- organizing the transport services by public transport,
- the transport needs monitoring and evaluating,
- optimising and controlling of financial flows,
- designing and implementation of integrated tariff system,
- preparation of development phases of ITS, etc.

When these responsibilities are not strictly defined in any document the authorities and operators have often the problem to agree immediately in the first phase of planning. This causes the total delay of whole project. This is the problem of Slovak republic. The following solution should be considered:

- the new Act focused only on the public passenger transport with the special part focused on the integrated transport systems, with the main aims to:
 - approve the role of coordinator, its status to other subjects involved in the ITS,
 - support the responsibilities of the coordinator

The key problem in Slovak Republic regarding to tariff is that the maximum prices for suburban bus transport, railway transport and urban transport are fixed by different administration. From 2005 the prices for suburban bus transport are regulated by regions. The prices for railway transport are regulated by the office for regulation of railway transport. Now the process of movement of the competences from the office to the regions is realized. But in this time the regions do not have the full competence to set the prices for railway transport. The urban transport is regulated by the municipalities.

Also each operator mode has its different type of tickets. It can be said that the operators of urban transport and railway transport offer s the wide range of single and season tickets depending on the time of use, the number of journeys and also the distances of journeys. But also these tickets are different. For example according to journey distance some operators use the time tickets (e.g. to 15 minutes, to 60 minutes), another use the number of stops the passenger travel through, the state railway operator use the kilometric tariff. Also there are the differences in the other season tickets. The suburban transport is provided by different operators in each regions of Slovakia but one thing is common for their offer of tickets (and completely different from other mentioned modes) – they do not offer the season tickets. They only offer the discount when the passenger uses the transport card.

The main aim of preparing the tariff integration in the conditions of Slovakia is to suggest the basic prices of all involved operators and to suggest the construction of the season tickets and special tickets. As it was mentioned above, the success integrated transport systems in Europe offer the wide

range of season tickets and there are the strategic way how to make ITS attractive from the financial point of view and be used in the promotion campaigns.

The promotion of public passenger transport is very poor in the conditions of Slovakia. The urban, suburban and regional railway transport are subsidized and the operators do not have a need to promote them despite the fact the number of passengers is still decreasing. The propagation has been focused usually on the tour transport. In the last years when the transport cards have been started used in the suburban transport, the promotion was focused on the lower price when passengers use these cards. It influenced passengers and they provided these cards. It showed that when the interesting prices and tickets are combined the passengers perceive the advantages and use them.

The process of integration in Slovakia should be based on the legislation, which should give instructions not only about the coordinator, its responsibilities, but also about the each phase of integration. Already in the pre-integration phase when the coordinator is not yet established, the basic solutions for mainly time coordination and tariff integration should be proposed. All the involved subjects, authorities and operators, should get the basic framework about the future cooperation within integrated transport system, the requirements which will be required from each of subjects. Also the terms for first integration phase should be set and these entire proposals should be contained in the document.

The first phase of integration so called founder phase – all the involved subjects declare their interest to participate in the integrated transport system and the integrated transport system is formally established. All the subjects should propose their delegate for the consultation during which the first plans and proposals are agreed. Also in this phase the subject of coordinator should be proposed. The coordinator is very important subject with its competences, which should be clearly declared and all other subject should respect the requirements of coordinator on data, information and cooperation. In Slovakia the development from last years and attempts of creating the integrated transport system showed that when the coordinator is established without any competences the other involved subject do not respect its requirements and the cooperation is more complicated.

The advances phase – usually the integrated transport system starts to operate after pilot phase. The integration is focused on the part of whole future full-integrated region. The tariff and transport integration is prepared and operated in the full extent and the operation is verified. During it the plans for the integration of other parts are preparing and the integration gradually is covering whole the area. The coordinator fulfils the function of controller and provides the financial flows. The marketing strategy is prepared.

6. Conclusions

Integrated transport system is successful when it is attractive for passengers in terms of offered services and advantageous fares. If the passenger has to decide for the public passenger transport in the form of integrated transport system and not for an individual automobile transport, he has to have the reason for such decision. The time of journey and the price for journey can be said as the key decision-maker factors. The time of journey in terms of integrated transport system can be competitive to individual automobile transport when the time and space coordination is provided for all the involved transport modes. Together with the suitable fares it can influence the decision of passenger.

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Tento článok vznikol v nadväznosti na riešený projekt spolufinancovaný zo zdrojov EÚ s názvom „Kvalita vzdelávania a rozvoj ľudských zdrojov ako piliere vedomostnej spoločnosti na Fakulte PEDAS Žilinskej univerzity v Žiline, ITMS 26110230083.“



Moderné vzdelávanie pre vedomostnú spoločnosť/Projekt je spolufinancovaný zo zdrojov EÚ

This article was created in response to the project co-financed by EU with the title „The Quality of Education and Human Resources Development as the Pillars of Knowledge Society of PEDAS Faculty of the University of Žilina in Žilina, ITMS 26110230083“.



Modern education for the knowledge society/Project is co-financed by EU