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The proposal of coordination the rail and bus passenger transport on the relation Žilina – Ružomberok

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Abstract

The current trend in passenger traffic is a sharp increase of individual passenger transport, resulting in substantial adverse environmental impacts such as congestion and traffic accidents. These negative impacts can be reduced by using an efficient system of public transport. Research realized at the Department of railway transport at the University of Žilina has showed high proportion of simultaneous connections between transport modes on the relation Žilina – Ružomberok. This state is inefficient and significantly increases the economic costs of public passenger transport.

The result of research is the proposal of optimization for passenger transport lines on the relation Žilina – Ružomberok, including the elimination of simultaneous connections. There are a major financial savings after this elimination that can be used to improve level of public passenger transport and creating integrated transport systems.

Another result of the research is the proposal of flow chart that use the predetermined criteria to assess the relevance of concurrent connections. The flow chart can be suitably adjusted according to various specified criteria and also expanded to more types of transport systems.

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1. Introduction

The main objective of passenger transport is to fulfill a transport needs and demands of the population. Current urban areas are characterized by a high level of concentration of population and growth in demand for transportation. This state negatively influences increase of transport costs and external costs such as air pollution, absorption of agricultural land because of expansion of transport infrastructure, level of accidents and not least congestion. Significant share to increasing such negative factors has a continual increase in individual passenger transport.

A significant decrease of these negative effects can contribute to efficient system of public transport. This requires the coordination of modes of transport and developing integrated transport systems, with emphasis on the greatest possible use of environmentally friendly modes of transport and efficient transport systems as such. Modal shift to more environmentally friendly modes of transport is one of the main objectives of Slovakia and the European transport policy.

An efficient cooperation of individual carriers with an appropriate split of public transport between the various transport systems can greatly increase the attractiveness and demand for public transport services.

Public passenger transport in Slovakia is in the vast majority realized by rail passenger transport or bus transport. Because of the overall efficiency of public transport it is necessary first of all to remove the parallelism of modes of transport connections, because these connections are inefficient and greatly increase the costs of public passenger transport.

It is necessary to determine a methodology to assess efficiency of using the individual transport systems and the division of labor among the different transport modes, with an emphasis on maintaining the availability of boarding and exit points and the overall level of quality of transport services.

2. Analysis of relation Žilina – Ružomberok

Department of Railway Transport at the University of Žilina conducted the research in the field of coordination of rail passenger and bus transport on the selected relation Žilina – Ružomberok. The research was focused on the analysis of the current state of public passenger transport and the proposal of coordination of modes of transport and the subsequent economic evaluation of the results of coordination. The goal is to eliminate simultaneous bus connections and to shift passengers to railway transport that is more environmentally friendly.

The aim of analysis is to determine whether rail transport is able to ensure the transport requirements and the required quality of transport services in the case of transfer of passengers from the bus transport. The analysis of public transport on given sections, necessary for determination of simultaneous connections, was focused on the following criteria:

- Comparison of cruising speed of bus and railway transport on selected relation
- Density and time position of each train connection
- Utilization of train and bus capacity
- Availability of railway boarding and exit points

Due to more thorough analysis as well as because of directional differentiation of transport routes, the relation was divided into the following sub-relations:

- Žilina – Vrútky.
- Vrútky – Kral'ovany.
- Kral'ovany – Ružomberok.

Term "simultaneous connection" is used for connections with the departure time not more than 20 minutes after or before the connection of different mode of transport [1].

On the basis of a detailed analysis of timetables carriers were determined simultaneous connections of railway and bus transport for all of the sub-sections (Tab. 1).

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