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Evaluating Riga Transport System Accessibility

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Abstract

Accessibility can be defined as the facility that helps people to reach a location to perform an activity. The research presents an overview of the case study: the accessibility analysis of the Riga public transport system. The transport system of Riga is presented and highlighted by the public transport services; the problems of public transport system and development plans are discussed. The author continues to analyse the project of the Riga Central Multimodal Public Transportation Hub that is planned in the frame of the Rail Baltica project and provides the analysis of the Riga Transport System accessibility in the current moment, before reconstruction. Accessibility was calculated on the base of the shortest journey time (or the fastest possible route) during the morning peak hours. The public transport accessibility was analysed and compared with the travel time by private cars. For the calculations, the author used Riga transport model, which is created in EMME software and supported by Riga municipality. The list of zones with the high level of travelling time that needs to be improved for more attractive public transport system was determined.

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1. Introduction

A sustainable urban transport system (SUTS) requires the strengthening of various features of the system, including accessibility and mobility, reliability and efficiency, as well as safety and security, social equity, convenience and comfort. It should be people- and environmental-friendly. The Urban public transport system

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(UPTS) should lead to enhanced mobility and generate greater equity between citizen groups. In order to achieve all these aspects, various challenges must be solved and one of the most important is the ability to measure all these features of the system. As represented in the report of the United Nations Economic Commission (UNECE, 2015) public transport is a main component of SUTS (see Fig. 1).

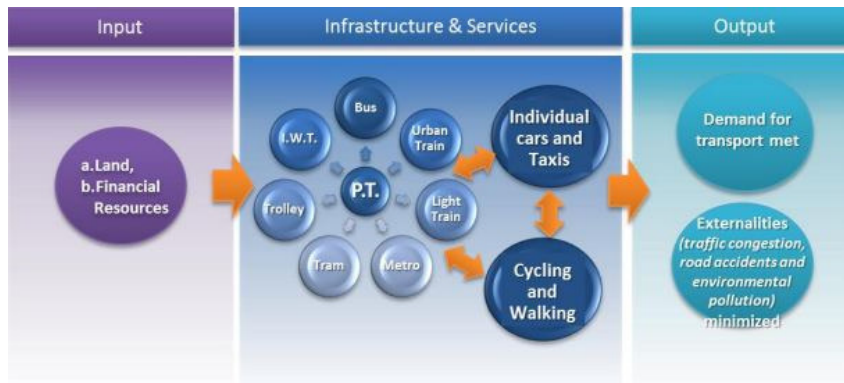


Fig. 1. Sustainable urban transport system (UNECE, 2015).

The UPTS is more attractive for commuters and more economically viable for operators if they offer the option to travel from one point of the city to another. Yatskiv and Budilovich in (2016) have analysed the main sustainability indicators which are significant for the Riga Transport System (RTS) and on the basis of the questionnaire have concluded that the accessibility is most important for the last one.

Accessibility can be defined as the facility that helps people to reach a location to perform an activity. Providing a link between transportation and land-use models, accessibility can be seen as an indicator to assess transport and land-use policies, especially in urban structures. Morris *et al.* (1978) give a definition of accessibility. Litman (2012), Geurs and van Wee (2013) provided an overview of literature into 'accessibility' and found different factors that affect accessibility: transportation demand and options, mobility, information, integration of the transport system etc. According to the definition, the level of accessibility depends on the location of activities, quality and quantity of infrastructures, as well as needs of people and companies. The level of accessibility has an impact on the economy because a well-functioning transport system in a combination with the land-use system is a condition for economic development. Accessibility is relevant for the economy, as well as fulfils a social role (van Wee, 2013).

Litman in (2012) concluded that there is no single indicator to capture accessibility. In fact, it depends on the goal of the study how the accessibility should be measured. Litman in (2015) proposed that sustainable transportation indicators should reflect accessibility-based planning, that tends to consider additional planning objectives (improved mobility for non-drivers, energy conservation, improved safety, etc.) and additional solutions (improving alternative modes, more efficient pricing, more accessible land-use development etc.). Litman (2013) suggested that accessibility-based planning is recognising the following factors that affect accessibility: mobility, the quality of transport options, transport network connectivity and land-use accessibility concerning accessibility-based planning.

The measures of accessibility are diverse and can be person-based, i.e. measuring the opportunities at the individual level or location-based, i.e. measuring the number of opportunities accessible from one location (Geurs and Ritsemavan Eck, 2001). The person-based accessibility accounts individual factors affecting one's ease of reaching its desired destination, whereas the location-based accessibility presents aggregated measures. The most common measure of the location-based accessibility is the cumulative opportunity measure, that counts the number of opportunities that can be accessed from one location within a given travel time (Geurs and van Wee, 2004). Several authors have written review articles on accessibility measures, focusing on certain perspectives, such as location accessibility (Handy and Niemeier, 1997), individual accessibility (Pirie, 1979; Kwan, 1998), economic benefits of accessibility (Koenig, 1980; Niemeier, 1997) or different perspectives (Geurs and van Wee, 2004).

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