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Factors influencing the transport accessibility level – seniors point of view

SUMMARY

The growing group of European older inhabitants, namely senior citizens (aged + 65) belong to the most vulnerable group to social exclusion. Transport accessibility is a concept, that can lead to enhancing life quality of seniors, which is shown based on the case study of Cracow, Poland as a European city. 100 seniors, that are living in different areas (urban, suburban), were asked for define different aspects that may influence their travel behaviour. Respondents were indicating their individual concerns connected with travelling, the existing barriers and expected solutions.

The goal of the paper is to present the main outcomes of the conducted surveys, in order to present the concept of transport accessibility in the context of the most important factors influencing seniors life quality. The accessibility conditions and barriers, which can affect mobility possibilities and different activities of senior citizens in urban areas, are indicated in the paper. The identification of the crucial aspects of accessibility play an important role in development of sustainable transport system together with sustainable urban design, that will be friendly for all citizens in aging society.

1. INTRODUCTION

1.1 Aging society

Ageing is a common trend in all societies in the world, as well in Europe, and this trend is also strong in Polish cities like Krakow (see fig. 1). Senior citizens (aged 65+) are a growing social group especially in big cities. Older people want to provide an active life and to live independently, without help of others (Zakowska and Kubiak, 2004), as long as possible. There are several barriers to their independent life and everyday activities. Individual mobility is regarded as one of the most important preconditions of independent life in older age. Together with health problems, outdoor mobility barriers can effect in restriction of social life, which may lead to social exclusion. Ability of senior's participation in outdoor activities is depending on their accessibility to transport infrastructure in independent way. The presented studies were compared with the results of the large EU project SIZE (www.size-project.at) (Life quality of senior citizens in relations to mobility conditions)

revealed (Zakowska and Kubiak, 2004 and 2005) multiple barriers of individual mobility of older people in Europe, among which poor accessibility to the public transport services was a significant restriction. SIZE Project was conducted almost a decade ago, and during last ten years a huge amount of European funds were put into several programs of upgrading transport infrastructure. In Poland, like in all other EU countries, most of the infrastructure related barriers were taken into consideration during renovation of public transport fleet and road infrastructure in cities.

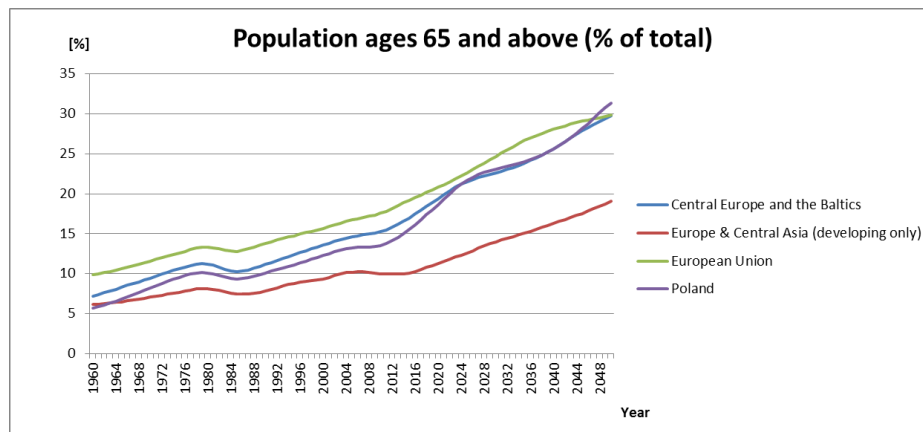


Fig. 1 - Projection of seniors population in the different part of the world.

Source: own elaboration based on <http://esa.un.org>

1.2 Accessibility concept

The concept of transport accessibility (e.g. Geurs and van Eck, 2001, Hull et al., 2012) is related to the role of spatial and transport system for society: it gives possibilities for people to participate in activities situated in different locations. At least two approaches to accessibility could be identified. The first one is focused on mobility or ability to make a trip. This concept concentrate on aspects of traffic flow geography and distribution of these flows between origins and destinations. The second approach to accessibility focused more on "ease of reaching" various goods and services situated in different destinations (e.g. Geurs and van Eck, 2001, Pulawska, 2014). According to the issue of seniors citizens, in the analysis another activities has to be considered, together with different needs connected with the level of public transport service and walking infrastructure.

2. RESEARCH STUDY

1.1 The Study goal

The current study goal is to evaluate changes in seniors perceiving of mobility opportunities completed during last decade. The research questions are therefore:

1. whether public transport development is in line with senior's friendly concept of transport accessibility?

2. how this is perceived by polish seniors, what kind of barriers connected to public transport usage they face today and what solutions they propose and support?
3. may the accessibility concepts and measures provide the answer to decision-makers, how create the senior's friendly urban environment?

1.3 The study scope

Almost a decade ago the large EU project SIZE was conducted (www.size-project.at) (Life quality of senior citizens in relations to mobility conditions) and revealed (Zakowska and Kubiak, 2004 and 2005) multiple barriers of individual mobility of older people in Europe, among which poor accessibility to the public transport services was a significant restriction. Presented in the paper results used for the comparison with latest polish studies are based on the results of 487 interviews with seniors from eight countries (Austria, Germany, Ireland, Italy, Sweden, Poland, Czech Republic, Spain). Seniors participating in the studies were selected in order to create a sample of all categories: seniors from big and small towns, villages; men and women; with various degrees of education, various types of economic activity and habitation, using various types of mobility (SIZE, 2005). Latest polish research were based on the survey studies carried out in 2015 on the sample of 97 seniors from Krakow and other part of Lesser Poland (75% live in Cracow metropolitan area, 21% in rural area, 4% in the small city; 59% of respondents were woman; 58% were in the age 65-74, 36% were in age 75-84, 6% were in age 85+).

1.4 Methods

SIZE project studies were conducted with the usage of focus-group interviews and in-depth interviews with senior citizens and experts (details of methodology description on <http://www.size-project.at>). The survey used in 2015 contained set of questions related to public transport usage (and walking conditions) divided into following groups:

- mobility and quality of life indicators,
- mobility barriers,
- solutions for mobility.

The accessibility conditions and barriers, which can affect mobility possibilities and different activities of senior citizens in urban areas, were the main point of interest in the conducted studies. The respondents were indicated possible barriers or obstacles that may affect the accessibility. On the other hand, seniors were asked to indicate the most urgent solutions for improving the accessibility. In order to compare the results of 2005 and 2015 studies, the average values in groups of variables were calculated.

Simultaneously, as a background of the survey studies, public transport infrastructure accessibility analysis for seniors citizens in Cracow were conducted. The analysis concerned evaluation of the senior citizens population (aged 65+) which can reach the nearest tram or bus stop within 5 minute walking distance (accessibility contour measures) (e.g. Geurs and

van Eck, 2001, Curtis and Scheurer, 2007, Pulawska, 2014). The applied walking speed was lower than in standard evaluations of pedestrian accessibility, due to the restricted physical mobility of older people. The walking speed adopted to the senior’s conditions was assumed as 1m/s (Olszewski, 2007). Using the GIS tool for spatial analysis, the areas in Krakow with the highest density of older people in the population were indicated. In the next step, the buffers with the radius of 300 m around bus and tram stops were set, as a representation of walking time within 5 minutes.

2. RESULTS ANALYSIS

Seniors public transport accessibility in Cracow

The results of the contour measures accessibility analysis are illustrated in Fig. 2 and Fig 3 and presented in table 1.

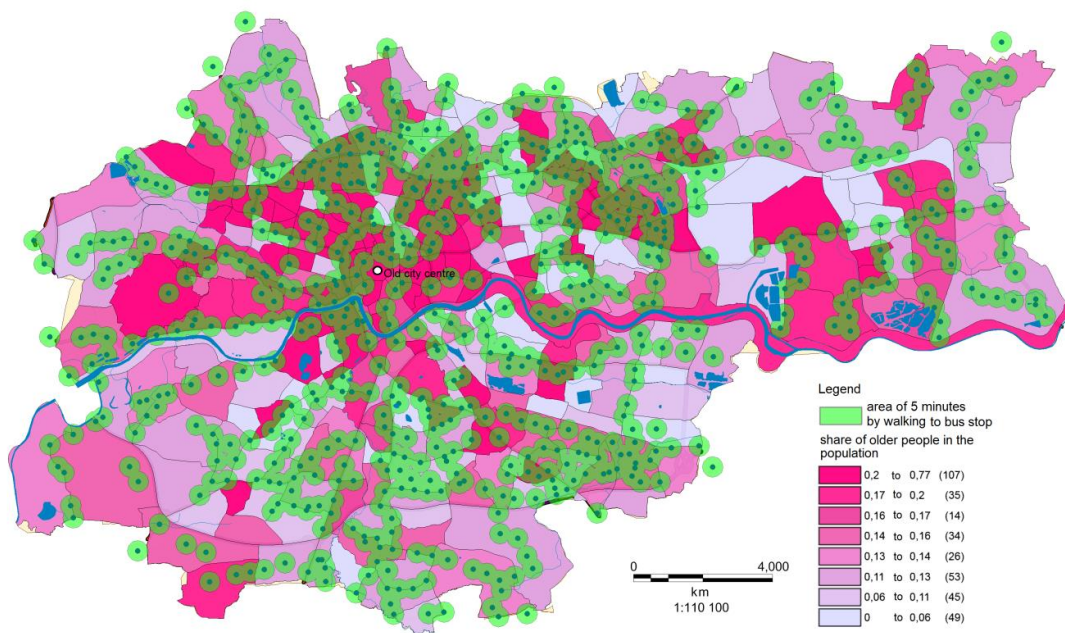


Fig. 2 - Cracow’ senior citizens accessibility to bus stops (source: Zakowska and Pulawska, 2014)

		Men over 65	Woman over 65	People over 65 total
total in Krakow		47388	75955	123343
in the 5 minutes buffer	bus stops	35547	57453	93000
	tram stops	17780	29590	47370

Table 1 – The number of elderly residents of Krakow with good accessibility level to public transport infrastructure.

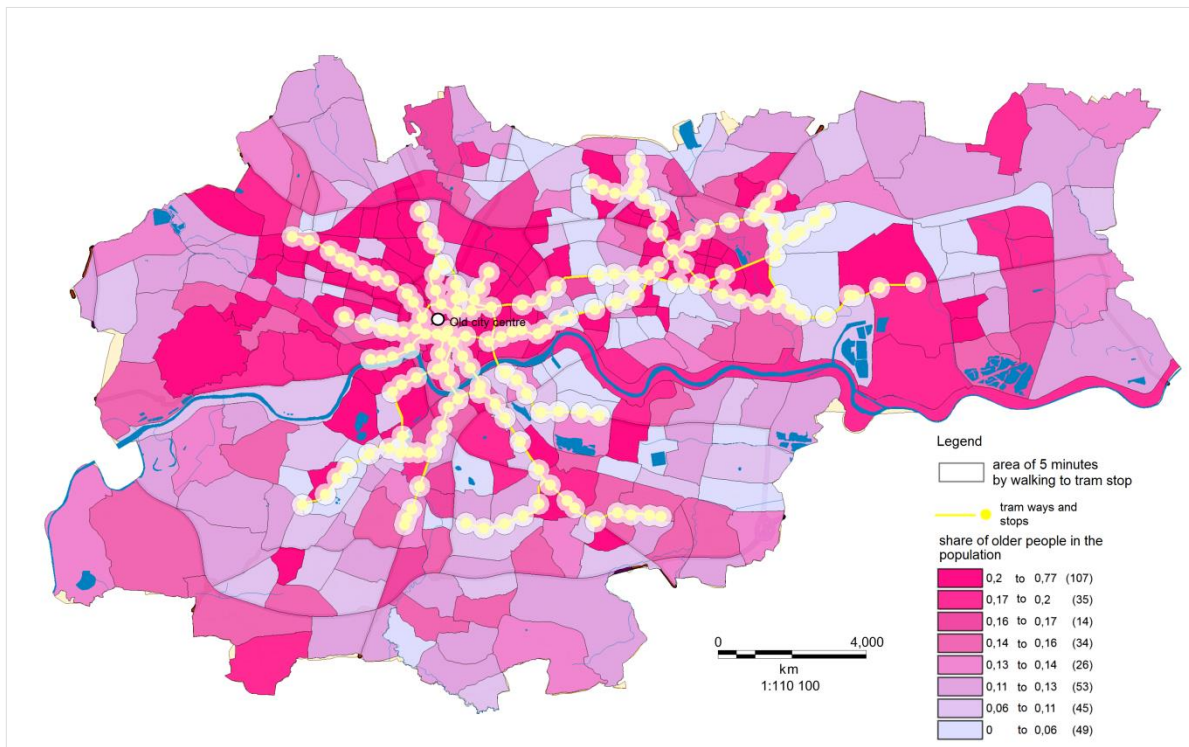


Fig. 3 - Cracow' senior citizens accessibility to tram stops (source: Zakowska and Pulawska, 2014)

According to the demographic-spatial information (GIS maps from 2010), 17% of Cracow populations are aged 65+. This group of inhabitants can enjoy a relatively good access to the public bus stops. This study results show that 76% of old men and old woman lives within 5 min walking access to the nearest bus stop. Bus infrastructure is dense and spread around all Krakow districts. However, the backbone of Cracow public transport system – tram infrastructure is not so easy available for all citizens - tram stop infrastructure is accessible within 5 minutes walk only to 38% of the whole senior citizens population (38% of woman, 39% of men).

Barriers and obstacles

Comparing the results from 2005 and 2015 study, it can be noted that some barriers are still significant or perceptible to an even greater extent. Senior public transport users complain the most about crowded vehicles, ramps on paths, vehicles on pavements and inconvenient and long crossings ("Roundabouts"). Less important become a barrier related to the lack of punctuality, insufficient routes, or ruthless drivers. Seniors still complain about not adapted to their needs high-floor vehicles, which makes very difficult to get in and out. This is also the most often mentioned and a major obstacle connected to public transport, that has been indicated in the open question.

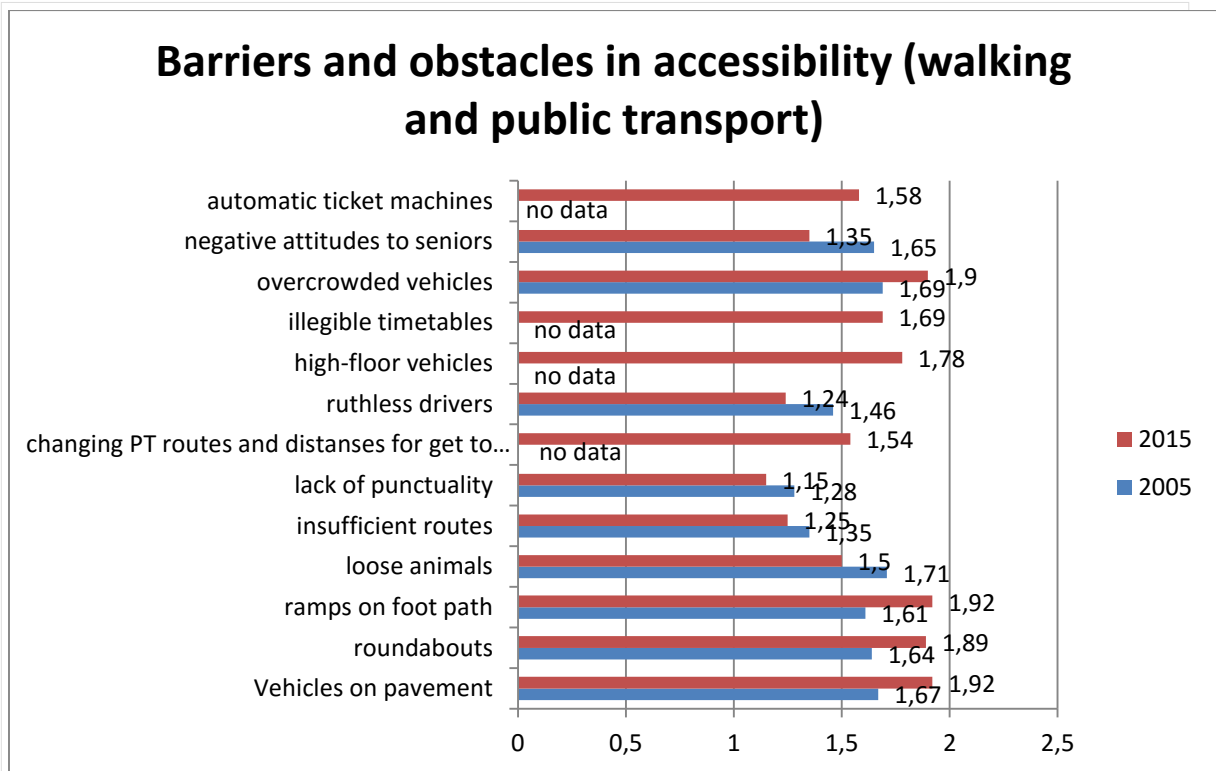


Fig. 4 – Barriers and obstacles in seniors accessibility

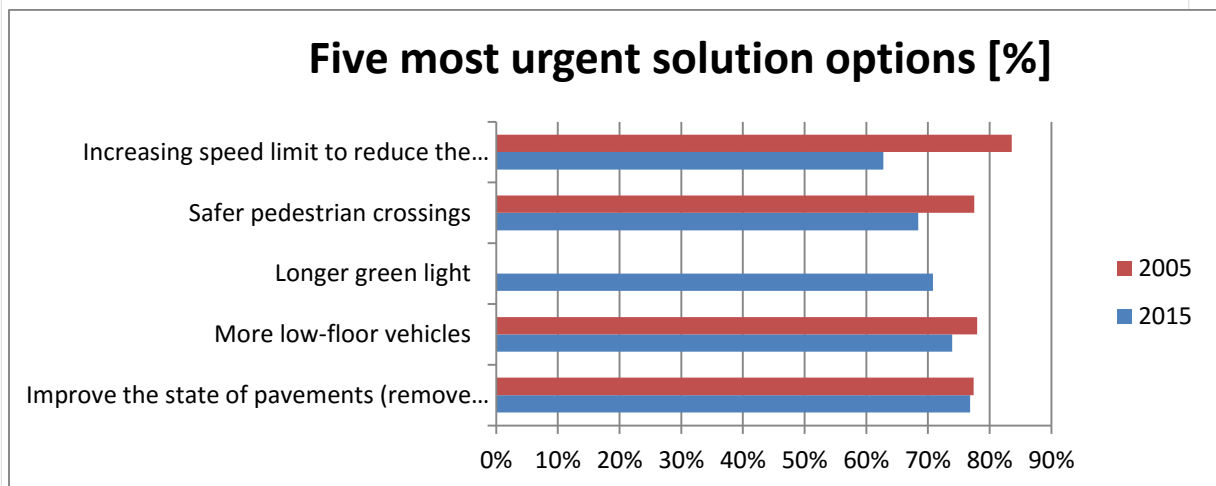


Fig. 5 – Most urgent solution for better seniors accessibility

The respondents were asked to indicate most urgent or rather redundant solution that may affect their accessibility level. Both now and in 2005 (for comparison, the results of the SIZE Project for all respondents), seniors indicated the same most urgent solution. Among them they distinguished the need of enforcing the speed restriction (more than 80% in 2005 and more than 60% in 2015), improvements in pathways infrastructure (77% in 2005 and 2015) and fleet (78% in 2005 and 74% in 2015), safer pedestrian crossings (78% in 2005 and 68% in 2015). The need of longer green light on the crossings was indicated in the first most urgent solution in 2015 (by 71% seniors), however in 2005 this solution wasn't considered.

3. CONCLUSIONS

In Poland , like in all other EU countries, most of the infrastructure related barriers were taken into consideration during renovation of public transport fleet and road infrastructure in cities. The accessibility conditions and barriers, which can affect mobility possibilities and different activities of senior citizens in urban areas, were indicated in the paper. The identification of the crucial aspects of accessibility play an important role in development of sustainable transport system together with sustainable urban design, that will be friendly for all citizens in aging society. Incorporating the accessibility individual component of senior citizens into general accessibility analysis, that often do not focus on the needs and conditions particular groups of inhabitants, is essential in reaching the goal, namely: reaching seniors friendly urban environment.

The demographic changes have the same tendency in all European countries, where the number of senior citizens are growing. This is also valid to many other developed regions. Personal mobility of seniors depends more than ever before on proper solutions in transport systems, where needs and mobility preconditions of older users must be first recognized, than included into policies and design and finally implemented.

Despite many promising studies and changes completed during last decade, seniors are still facing problems in everyday activities in Poland, as the last survey revealed. This problems are connected mostly to public transport related barriers namely poorly adapted fleet and pavements. The most significant claim is fully adapted to seniors need fleet and infrastructure. The new growing barrier is the necessity of acceptance and cooperation with new technology solutions.

The studies has shown that seniors appreciate big transformation in public transport quality of service. These results also confirmed positive changes in social attitude toward seniors. Summing up, it is important to care about solutions that will be created and developed together with participation of seniors to meet their needs, which may evolve simultaneously with the development of technology.

Finally, it was interesting to check, how the new measures of accessibility are representing seniors opportunity to rich public transport stops in different parts of the Krakow city. This accessibility measures let us also to evaluate the number of elderly residents of Krakow with good accessibility level to public transport infrastructure, namely to bus and tram stops. Accessibility indicators confirmed the results related to seniors opinion on the quality of public transport, presenting the similar percentage of residents not satisfied with the existing distance to bus and tram stops like the percentage of areas with lover accessibility to public transport infrastructure.

Further studies on accessibility indicators for evaluation life quality related to public transport access for older residents is recommended.

References:

- HULL, A., SILVA, C. and BERTOLINI, L. (2012). *COST Action - Accessibility Instruments for Planning Practice*, European Science Foundation.
- CURTIS, C. and SCHEURER, J. (2007). *Accessibility Measures: Overview and Practical Applications*. Curtin University. Urbanet.
- GEURS, K. and VAN ECK, J.R. (2001). Accessibility measures: review and applications. RIVM.
- OLSZEWSKI, P. (2007). *Walking as a mode of transport – a planning and policy perspective*, Oficyna Wydawnicza Politechniki Warszawskiej. Warszawa.
- PULAWSKA, S. (2014). Preliminary results of experiment concerning evaluation of Krakow public transport accessibility, *Logistyka* 4/2014.
- ŻAKOWSKA, L. and KUBIAK, M. (2004). Warunki mobilności osób starszych w Europie – podsumowanie stanu wiedzy na podstawie badań projektu SIZE, *Transport Miejski i Regionalny* 12/2004.
- ŻAKOWSKA, L. and KUBIAK, M. (2005). Analiza warunków mobilności osób starszych w Europie na podstawie studiów jakościowych projektu SIZE, *Transport Miejski i Regionalny* 02/2005.
- ŻAKOWSKA, L. and PULAWSKA, S. (2014). Equity in transportation: new approach in transport planning - preliminary results of case study in Krakow, *Transport Problems*. – 2014, Vol. 9, Iss. 3. pp. 67-74.
- <http://esa.un.org> - Web site of The United Nations Population Division's World Population Prospects.
- www.size-project.at – web site of EU project SIZE - Life quality of senior citizens in relations to mobility conditions.