Considering the Preferences of Adults and Elderly Individuals While Examining the Spatial Justice of the Distribution of Urban Facilities: A Case Study of the Small Town of Fiľakovo (Slovakia)[1]

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Considering the Preferences of Adults and Elderly While Examining Spatial Justice of Urban Facilities Distribution: A Case Study of a Small Town Fiľakovo (Slovakia). By commonly requiring smaller walking distances, elderly have been considered more vulnerable when accessing urban facilities, and thereby have fewer urban opportunities than an "average adult". Yet is not clear if this disadvantage remains significant after considering the different needs of the elderly. The main aim of this study was to provide an analysis of the spatial distribution of urban facilities, while considering differences in preferences for facility types of the elderly (over 65 years of age) and adults (under 65 years of age). Participants residing Fiľakovo (Slovakia) were asked to state a visitation frequency of urban facilities. All the facility types mentioned by the residents were then mapped. Accessibility to opportunities was calculated in a trigonometric model of fictitious public space users, with the differences between the age groups being tested with a Mann-Whitney U test. Areas of interest for adults and the elderly were calculated using Kernel density analyses. The results showed that even after considering the different needs and preferences of the elderly, there were still significant differences in opportunities within their walking distance compared to adults. The spatial patterns of the areas of interest were similar, but with higher values of the kernel density in the case of adults. Inequalities emerged particularly in areas where facilities catering to daily needs were absent. Indeed, to mitigate the socio-spatial injustice, it would be beneficial to deconcentrate the municipality-controlled facilities.
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Introduction

The global urbanisation rate is rising steadily and, according to the United Nations (2018), it will increase to 60% by 2050. Cities are therefore facing challenges in ensuring their sustainable development as well as in providing a good quality of life for their citizens. Important studies pertaining to

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sustainable cities began to emerge in 1990s (e.g., Banister et al. 1997; Haughton 1997; Satterthwaite 1997). A sustainable city can be defined as an urban area with an economic, environmental, and social development that can continue in the future. However, these three dimensions frequently receive unequal attention, with the social one often being neglected[4]. The central component of social sustainability is equality (Eizenberg – Jabareen 2017). The term "spatial justice" has been used in geography, which refers to the "fair and equitable distribution in space of socially valued resources and opportunities to use them" (Soja 2009: 2).

It is especially important to address social and spatial justice in the context of ageing populations in European cities, as this process is directly related to the increasing demand for services and urban facilities used by the elderly. According to Van Hoof and Kazak (2018), in OECD countries, more than 43% of older adults (65 years old and more) live in urban areas. In this context, the spatial distribution of urban facilities is especially important, since the abilities of the elderly often limit their movements around the city. Therefore, there is a need to situate preferred places and services within a walking distance of their dwellings.

Urban facilities have been studied by numerous authors, with some of them also focusing on the needs of older people (e.g., Chen et al. 2019; Gauvin et al. 2012; Zimmer – Chappell 1997). Yet, there has been lack of studies comparing the needs and preferences of the elderly for urban facilities with other age categories of city dwellers. Additionally, such studies have been conducted in cities or rural areas while research in small towns has been absent, and importantly, these have not considered spatial dimensions.

In this paper, spatial justice was studied in relation to equal opportunities in public space for all its users, with the aim of providing an analysis of the spatial distribution of urban facilities, while considering differences in the needs and preferences of the elderly and adults under 65 years of age (hereinafter termed as "adults" in this study).

Theoretical background

Social justice is a *"universal principle that produces social, cultural, and economic equality for all individuals"* (Gess 2016: 124). The early history of social justice and sociology was described by Romero (2020). While some authors have placed greater emphasis on the social dimensions of justice, others have focused on its spatial ones. Among the leading researchers promoting the idea of injustice mainly having a spatial cause, as well as remedies, the most

[4]Based on the number of records in the WoS database (15th April, 2022) when searching studies using keywords "environmental sustainability", "social sustainability" and "economic sustainability".

famous is Edward Soja (e.g., Soja 2010). On the other hand, Peter Marcuse claimed that spatial remedies to injustice are insufficient (Marcuse 2010), since the origins of injustice are commonly rooted in broader economic, political, and social arenas, with space being only a partial cause of the problems (Marcuse 2009). For a more detailed comparison of Soja's and Marcuse's approaches, see the work of Iveson (2011). Social and spatial justice relate to the concept of *Right to the city*, originally proposed by Henry Lefebvre who described it as: *"the right to information, the rights to use of multiple services, the right of users to make known their ideas on the space and time of their activities in urban areas; it would also cover the right to the use of the center"* (Lefebvre 1991: 34 in Marcuse 2009: 189). However, as pointed by Marcuse (2009), it is necessary to think about whose rights should be considered. In this regard, Romero (2020) highlighted that even in sociology, marginalised groups were often forgotten about in the past. In this paper, we focused on the distributive justice (a just distribution of benefits and burdens within a society), with one of the measures ensuring it being the guarantee of minimum standards of accessibility to key destinations (Pereira et al. 2016). In Slovakia, spatial justice was previously studied in relation to food desserts (Bilková et al. 2017; Križan et al. 2015; Trembošová – Jakab 2021), school and pre-school accessibility (Križan et al. 2021; Sládeková Madajová et al. 2021), transport-related disadvantages (Székely – Novotný 2022; Rišová 2021; Rišová 2022; Trembošová – Kohutiar 2022), safety perception of walking environments (Rišová – Sládeková Madajová 2020), access to drinking water in marginalised communities (Rochovská et al. 2021), etc.

One of the basic planning strategies for sustainable cities involves ensuring accessibility through a density of destinations (e.g., home, workplace, school, urban facilities), as well as related mixed land uses (Haselsteiner et al. 2015; Sung et al. 2015). Such an approach leads to spatial proximity which is a prerequisite for the use of slow transport modes such as walking or cycling, which have been broadly considered to be the most socially, environmentally, as well as economically sustainable ways of moving around an urban area (e.g., Brand et al. 2021; Ek et al. 2021; Nourian et al. 2018). Walking, in particular, is available to most socio-economic groups of urban dwellers, while not harming the environment and requiring the lowest operating costs. The concept of "sustainable accessibility" has arisen (Bertolini et al. 2005, Solá et al. 2018), defined as the possibility of reach locations to meet daily needs by solely using sustainable modes of transport.

However, a maximum comfortable or acceptable walking distance and walking duration are not easy to define due to different characteristics of individuals, in addition to environmental variables. Indeed, there is no universal consensus regarding a walking distance that is suitable for all public space

users and locations. Yet, as pointed by Azmi et al. (2012) in an urban planning context, the general maximum comfortable walking distance to urban facilities is often considered to be 400 m, while in case of the elderly, the value can drop to 190 m. This has traditionally been explained by numerous limitations related to ageing. For example, Byles et al. (2015) found that the mental health and physical functioning of older adults were related to the extent of their activity space. In another study, older pedestrians behaved more riskily than members of other age groups and had difficulties in their decision-making process while crossing streets, which was explained by their reduced visual and cognitive abilities (Zito et al. 2015).

Yet, despite the general assumption of the younger public space users being more capable of walking, there have also been studies questioning this stereotype. For example, in a study by Prins et al. (2014) conducted in the Netherlands, 62% of the elderly walked for distances exceeding 500 m to a grocery shop. In the same study, elderly over the age of 75 walked both more often and over longer distances than those under the age of 75, which was, however, caused by a switch from cycling to walking at an older age. However, since cycling is not equally popular in all regions of the world, such results cannot be generalised to areas with different cultures or environmental characteristics (e.g., rangy relief). Nevertheless, such surprising findings have often been related to the fact that the elderly cannot be perceived as a homogenous group. Differences in socio-economic and cultural backgrounds, age, gender, physical and mental abilities, residential location, as well as the possession of a valid driving license and the capability to drive have been found to affect walking activity and characteristics of activity spaces of the elderly individuals. As a result, some older adults can be considered more vulnerable than others. For example, Plaut et al. (2021) found that those who were afraid of falls or faced a high risk of falls walked less, had smaller activity spaces, and walked over shorter distances than other seniors. In another study, socially disadvantaged persons (including the elderly) did not have significantly smaller activity spaces compared to others, when examined in areas with a generous public transport provision, numerous shopping opportunities in a neighbourhood, and small income inequalities (Schönfelder – Axhausen 2003). In addition, research to date has shown that private transport plays an important role in the mobility patterns of elderly as well. Numerous studies have shown that those individuals with valid driving licenses and an ability to drive reported more mobility and larger activity spaces than others (e.g., Byles et al. 2015; Hirsch et al. 2014; Shah et al. 2012). On the other hand, an inability to drive and no access to private transportation were associated with a reduced willingness to travel out of the home (Sikder – Pinjari 2012) and related disadvantages in community participation (Zeitler – Buys 2015).

In summary, the abovementioned studies revealed that longer distances can be suitable even for the elderly, however, only in the case of those persons who are considered less vulnerable (younger healthy seniors without physical and cognitive restrictions, and/or those with higher incomes and access to private transport). Maintaining shorter distances between destinations is therefore still an important priority for moderating inequalities in public space. Highly walkable environments and a provision of meaningful destinations are prerequisites for active modes of transport among older adults. As found by Winters et al. (2015), elderly individuals in a highly walkable environment made 80% more walking trips than other older adults across the region. Similarly, Li et al. (2005) showed that a walkable environment, together with a sufficient number of urban opportunities, were important factors encouraging walking among older adults.

However, each urban facility type has a different importance for an individual. In addition, although several studies have identified the types of urban facilities which were important for older adults in general, the differences among age categories of the individuals have not yet been sufficiently explored. Moreover, even if such findings existed, it is questionable to what extent these could be generalised, since individuals worldwide do not have the same preferences and/or opportunities. However, grocery stores, for example, are among the most frequently visited destinations both among adults and the elderly (e.g., Haugen 2011; Lee – Moudon 2008, Wang – Lee 2010; Winters 2015). However, it is difficult to define definite patterns when considering the visitation frequency to most of these facility types since their importance can vary based on differences in factors affecting individuals' lives (e.g., culture, religion, economic status, etc.).

Based on the above, elderly can be perceived as a vulnerable group inhabiting urban environments regarding their ability to reach important destinations. On the other hand, it remains unclear if these differences remain significant when considering the different needs and the preferences of elderly population. Our research questions were the following:

1. Is there a significant difference in urban opportunities for adults and the elderly? What are the differences in the accessibility to facilities for the two age groups examined?
2. Is there a difference in the spatial patterns of the areas of interest for adults and the elderly? If so, what was this difference?

The term "opportunities" is here defined as a facilities provision after considering the different needs and preferences of the elderly and adults. To ensure that meaningful results were reached in this study, mapping of the facilities and

spatial analyses were preceded by data collection regarding visitation frequency of facilities obtained by both adults and elderly groups residing within the study area. The access to opportunities was then calculated in a model using fictitious public space users, separately for adults and the elderly.

Methods

Research area

This research was conducted at the southern edge of Slovakia in a small peripheral town of Fiľakovo with a population of nearly 10, 000 inhabitants. According to the Statistical Office of the Slovak Republic in 2021, there were 1,663 residents aged 65 and over, with 6,293 adults aged 18-64 inhabiting the town. The area is typical for its economic deprivation, migration from the region, and related ageing of its population. Yet, the town is a centre of social life for not only its residents but also for inhabitants from surrounding rural areas; the area provides the nearby populations with basic urban facilities pertaining to healthcare, transport, primary and secondary education, public administration, culture, sports, etc. However, since the town is not served by intra-urban public transport, it can be assumed that its inhabitants are often dependent on walking while moving around the area with a proximity to facilities playing an important role for them. This can have a negative effect especially for individuals with reduced mobility, such as the elderly, children, and individuals with various types of impairment, etc., as well as for individuals with limited access to a private car. It is nonetheless important that key facilities are accessible within a walking distance for populations residing in towns of this type.

Data

To evaluate the different importance of each facility type, this study surveyed a total of 28 adults (18-55 years old; with an average age of 36; 57% women) and 24 older adults (65-80 years old; with an average age of 69; 54% women) residing the town of Fiľakovo; the respondents reported a visitation frequency of urban facilities by filling a reply form. The sample selection was random. The survey was conducted from December 12th to December 29th, 2021. The pre-prepared list of urban facilities consisted of the following: playgrounds, sport facilities, parks, groceries, specialised shops, bus stops, kindergartens, primary schools, secondary schools, primary art schools, public libraries, pharmacies, general practitioners, bank branches, ATMs, and post offices. These facility types have been broadly considered as necessary to meet the

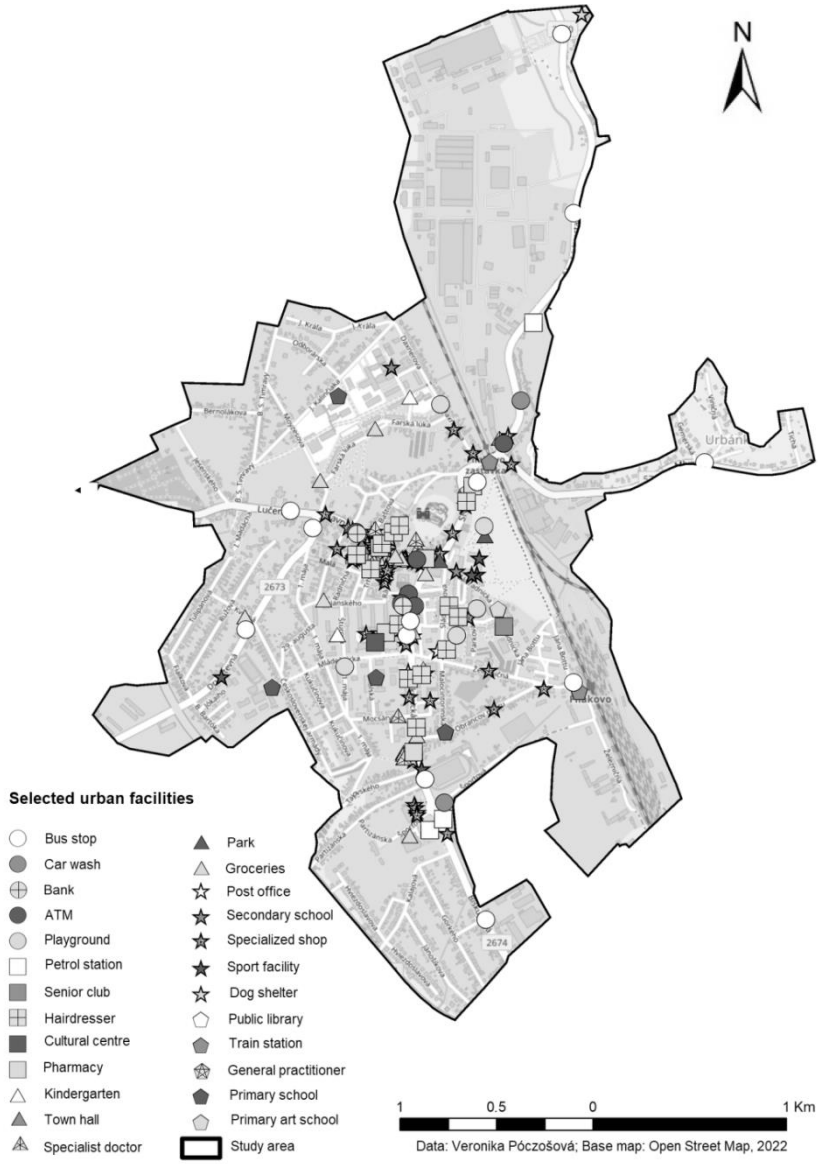
needs of urban dwellers while maintaining their quality of life (e.g., Rišová – Pouš 2018).

Along with a pre-prepared list of facility types, there was a possibility of adding other items of a participant's choice, if necessary. Adults added a specialist doctor, a railway station, a dog shelter, a petrol station, and a hairdresser as facilities they visit at least once a year. The elderly chose a cultural centre, a senior club, a specialist doctor, a car wash, a hairdresser, a town hall, a railway station, and a petrol station. Some respondents stated that they used the petrol station as a place to chat with friends over coffee since cafes, bars, and restaurants were closed due to the pandemic measures undertaken at the time of the survey[5]. Participants were asked to state their visitation frequency to each of these locations by opting from the below: "daily", "several times a week", "once a week", "several times a month", "once a month", "several times a year", "once a year", and "I do not use it". Subsequently, the facility types mentioned by the respondents were under field mapping. The quantified importance of each facility type was used as a weight for further calculations.

The mapping of the facilities was conducted using Locus GIS (a free Android app developed by the Asamm Software (2023). The facility types were defined as follows: all places with at least one element for children to play (e.g., sand box, swing, slide etc.) which are public and free of charge were considered a playground. Similarly, in the case of sport facilities, only areas accessible to all individuals and free of charge were mapped. As park, areas with park vegetation, benches, and pavements that are generally known parks by residents of the town were considered. Groceries were defined as retail establishments with mixed food supply. On the other hand, specialised shops were those with a specific food supply (e.g., bakeries, butchers), as well as all retails with other goods (e.g., fashion store, stationery, drugstore, electronics, etc.). The exception were pharmacies, which formed a special category. In the case of general practitioners and specialised doctors, outpatient clinics were mapped for all age categories. There was no need to define other facility types, as their meaning was clear. The facilities are shown in Figure 1.

[5] As primary functions of car wash and petrol stations are related to automobile transport, these facilities were not considered in the research, as the focus of the study was on walking.

Figure 1: **Urban facilities visited by participants in the town of Fiľakovo**



Calculations

The visitation frequency quantification was based on the fact that an average year lasts 365 days. Therefore, it could be defined as a number of days in

a year, during which a particular facility was visited by an average individual. This way, values were calculated for: daily (365.00), once a week (52.14), once a month (12.00), once a year (1.00), and never (0). The remaining frequencies, i.e., several times a week (208.57), several times a month (32.07), and several times a year (6.50), were then calculated as an average of the two adjacent values. The annual visitation frequency of a facility type by an average adult or elderly was then calculated as the sum of the frequencies stated by the participants divided by the number of participants, for an average adult and an average elderly separately[6].

Table 1: **Weights of the facility types of the elderly**

Priority	**Facility type**	**The annual visitation frequency by an average elderly**	**% of total annual visits by the elderly Share (S_e)**
1.	groceries	163.95	28.15
2.	specialised shops	77.80	13.36
3.	parks	65.69	11.28
4.	primary schools	54.63	9.38
5.	pharmacies	28.90	4.96
6.	playgrounds	27.15	4.66
7.	post offices	27.10	4.65
8.	kindergartens	23.90	4.10
9.	atms	23.65	4.06
10.	bus stops	19.90	3.42
11.	public libraries	17.44	2.99
12.	general practitioner	16.71	2.87
13.	primary art school	10.90	1.87
14.	bank branches	9.38	1.61
15.	specialist doctor	4.28	0.73
16.	sport facilities	3.99	0.69
17.	senior club	2.67	0.46
18.	cultural centre	2.17	0.37
19.	railway station	1.61	0.28
20.	hairdressers	0.27	0.05
21.	town hall	0.27	0.05
22.	secondary school	0.08	0.01
	Total annual visits by elderly	**582.44**	

[6] As an example, a general practitioner was visited by seven seniors several times a week (224.49), while 12 seniors used his outpatient clinic several times a month (144) and five seniors several times a year (32.5). The sum of importance rates (400.99) divided by 24 elderly respondents is the final weight for general practitioners (16.71). This way, all the facilities are given a weight, separately for adults and the elderly.

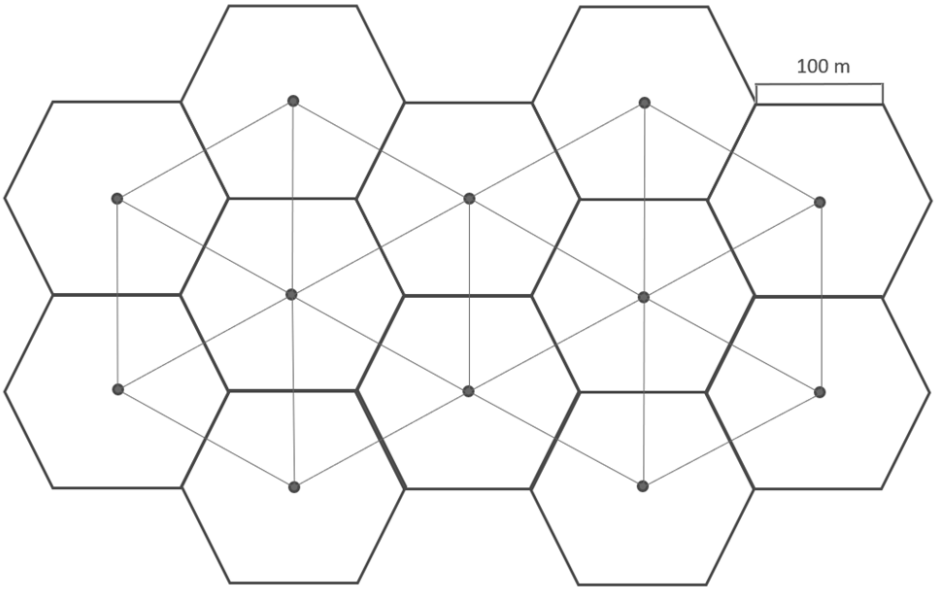
As shown in Tables 1 and 2, an average adult visited 822.12 facilities during a year, while an average elderly one visited 582.44 (hereinafter as "total annual visits"). Subsequently, the share values were calculated (% of total annual visits by elderly (S_e) and adults (S_a)) for each facility type, since each facility type contributes to the total annual visits differently and therefore cannot have the same weight in the following calculations.

Table 2: **Weights of the facility types of adults**

Priority	Facility type	The annual visitation frequency by an average adult	% of total annual visits by adults Share (Sa)
1.	groceries	232.2	28.24
2.	park	138.62	16.86
3.	primary school	73.09	8.89
4.	bus stop	65.76	8.00
5.	specialized shop	65.42	7.96
6.	kindergarten	53.52	6.51
7.	atm	49.48	6.02
8.	playground	35.38	4.30
9.	pharmacy	33.45	4.07
10.	post office	22.37	2.72
11.	railway station	20.91	2.54
12.	general practitioner	8.26	1.00
13.	bank branch	8.50	1.03
14.	dog shelter	7.45	0.91
15.	sport facility	4.80	0.58
16.	public library	1.79	0.22
17.	specilist doctor	0.46	0.06
18.	hairdresser	0.43	0.05
19.	primary art school	0.23	0.03
	Total annual visits by adults	**822.12**	

Next, the accessibility models for adults and elderly were built. The town was divided through a hexagon grid with a side of 100 m. The centroids of the hexagons were considered fictitious individuals each of whom needs to reach the preferred facilities. Only the centroids within the boundaries of the study area were included in the calculations. The final sample thus consisted of 133 fictitious seniors and 133 fictitious adults, and was placed in a uniform trigonometric network with a side of a triangle of 173.21 m.

Figure 2: **Simplified diagram of the trigonometric model used in the analysis.** Centroids of hexagons are considered fictitious individuals each of whom needs to reach the preferred facilities.



Source: Authors, 2023

According to the theory of walking distance for vulnerable groups (see the Theoretical background section of this paper), the walking distance for seniors was set to 200 m, while that of the adults was restricted to 400 m. A buffer with a walking distance radius was created around each centroid[7] to calculate the opportunities of each individual's surroundings. The opportunities in a buffer were calculated as follows:

$$O = \sum_{i=1}^{j} \left(\frac{n_i}{N_i} * S_i \right)$$

[7] In some works, network analyses were used to examine the proximity to facilities (e.g., Križan et al. 2015). However, in Fiľakovo, the important part of the pedestrian environment is not spatially related to roads, but instead, consists of parks, pedestrian zones, and other similar areas. Therefore, the buffers were used to delimit the walking areas.

Where *O* refers to the opportunities in a buffer, *n* is the number of elements of a particular facility type in a buffer, *N* is the number of elements of a particular facility type within a town, *S* is the share constant for a facility type, *i* refers to a facility type, and *j* is a number of facility types considered. This way, the opportunity value reflects both the number and diversity of facility types in a buffer, with a special emphasis on the visitation frequency of the age group examined.

Finally, the significance of differences in opportunities reachable within a walking distance of adults and elderly were tested. The Shapiro-Wilk test and the Levene's test showed that the assumptions of the normal distribution and homogeneity of variances were not met. Therefore, the non-parametric Mann Whitney U test was used to test these differences.

To compare the spatial patterns of areas of interest for both groups examined, the kernel density of point features per square kilometre was calculated. The search area was set to 300 m. The annual visitation frequency by an average adult and elderly were used as a weight for calculations for each facility type.

Results

Even after the specific needs of elderly have been taken into account (preferred types of facilities and different visitation frequency), there were still significant differences in opportunities reachable within a walking distance (200 m in the case of elderly individuals, 400 m in the case of adults) by the two age groups examined ($p < 0.05$) (Mann Whitney U = 13025, p-value = 1.834e-11). Facilities located within the buffers of the adults reflected their needs to a greater extent compared to those of the elderly. Selected differences in accessibility of facilities are shown in Table 3.

As shown in the Figure 3, the spatial patterns of areas of interest for adults and the elderly were relatively similar. In both cases, the highest values of the kernel density were recorded in the central part of the town (the primary area A). The area A is typical for its historical buildings, proximity to the castle and the highest concentration of urban facilities in the town. Another area (b) was located on the southern edge of the historical core. The higher values of the kernel density in the case of the adults there were probably caused by the existence of ATMs, bus stops, and banks, that were more frequently used by the former than the elderly. In area c, only groceries and specialized shops are located although these were frequently visited by both groups examined. Several facilities (rarely visited by both age groups) were located between areas b and c. These include, for example, specialist doctor, sports facilities,

and hairdressers. Facilities visited more often (e.g., groceries) are only found here in limited quantities. Indeed, there are important differences between the tertiary areas of interest, such as areas ii (with only one element of urban facilities – a grocery shop) and iii (with two elements – a grocery shop and a bus stop), which are absent in case of the elderly. On the other hand, the area i relates to both of the groups examined. In this area, several facilities are located, however, their composition makes this location less important. There are several less frequently visited health-related elements, with a less numerous mixes of other facility types. Overall, in all the areas of interest, higher values of the kernel density of point features were reached in case of adults.

Table 3: **Comparison of the accessibility of facility types within the buffers of elderly and adults**

Facility type	**Priority**		**Number of elements in an average buffer**		**Buffers with the absent facility type [%]**	
	elderly	adults	elderly	adults	elderly	adults
groceries	1.	1.	0.47	1.79	73.68	46.62
specialised shop	2.	5.	2.37	9.28	67.67	39.10
park	3.	2.	0.08	0.29	93.98	81.95
primary school	4.	3.	0.16	0.50	85.71	63.16
pharmacy	5.	9.	0.19	0.70	84.21	63.16
playground	6.	8.	0.17	0.72	85.71	58.65
post office	7.	10.	0.08	0.29	93.23	80.45
kindergarten	8.	6.	0.07	0.27	93.23	72.93
atm	9.	7.	0.24	0.84	88.72	70.68
bus stop	10.	4.	0.35	1.29	70.68	21.05
public library	11.	16.	0.04	0.14	96.24	85.71
general practitioner	12.	12.	0.20	0.73	90.98	75.94
primary art school	13.	19.	0.03	0.14	96.99	85.71
bank branch	14.	13.	0.08	0.29	93.23	78.95
specialist doctor	15.	17.	0.34	1.35	86.47	60.90
sport facility	16..	15.	0.15	0.67	90.23	63.16
senior club	17.	N/A	0.04	0.14	96.24	85.71
cultural centre	18.	N/A	0.04	0.14	96.24	85.71
railway station	19.	11.	0.08	0.24	92.48	75.94
hairdressers	20.	18.	0.47	1.89	83.46	60.90
town hall	21.	N/A	0.03	0.16	96.99	84.21
secondary school	22.	N/A	0.08	0.27	91.73	73.68
dog shelter	N/A	14.	0.01	0.02	0.99	97.74

Figure 3: **Spatial patterns of the areas of interest for adults and the elderly.** Based on the kernel density values, the areas were were considered of the primary (A – up to 700,000), secondary (b, c – up to 350,000), and terciary (i,ii,iii – up to 100,000) importances.

Discussion and conclusions

In this study, the accessibility to preferred urban facilities for adults and the elderly were compared to study spatial justice within the ageing society of a small post-socialist peripheral town. Several interesting findings emerged.

The primary finding was that the number of opportunities for seniors were not in line with their preferences and needs to the same extent as for adults. The differences in opportunities for elderly and adults were significant even after considering the specific needs of both groups examined. The spatial patterns of areas of interest for adults and seniors were similar; however, the accessibility of the preferred facilities differed significantly, even after considering the

specific needs of both groups examined. In this context, it is important to highlight some important findings.

First, looking at grocery stores (the most often visited facilities both by adults and the elderly as well as the most important facility ensuring access to food as a basic human need), opportunities of the elderly were poorer compared to adults: an average elderly can reach 0.47 grocery shops in a walking distance, while the value for an average adult is 1.79. Limited choices can put individuals at an economic disadvantage when they do not have the opportunity to travel for a cheaper (or of a higher quality) alternative. Since the elderly in Slovakia are economically one of the most vulnerable groups, such spatial inequality may threaten them even more than others. According to Guy and David (2004), the physical disadvantage of residents (in terms of mobility and accessibility), lower incomes, and the lack of food stores in a neighborhood can be considered some of the food desserts attributes. Especially important is accessibility to large-scale shopping units, which are typical for generally lower prices compared to small-scale grocery shops. As revealed by Križan et al. (2015), prices in large-scale grocery shops proved to be generally lower compared to small-scale units. Consequently, not only the accessibility, but also the ability to choose from multiple stores and their attributes are important in mitigating spatial inequalities.

Second, some facilities which are particularly (or, in some cases even solely) preferred by the elderly are placed in only one location, so they are not within walking distance for most pedestrians. These are, for example, cultural centre, library, and the senior club. Such locations are helpful in supporting socialisation and cultural activities. Moreover, performing activities (Leontyeva et al. 2016), being involved with people, and having close personal relationships (Jopp et al. 2015; Strawbridge et al. 1996) have proven to be some of the main preconditions for successful ageing.

Another important finding was related to parks (second most often visited facility type by the elderly). Parks were accessible by walking less for elderly individuals than for adults. Despite the impossibility of homogenising motives and preferences regarding park use for all groups of their visitors (e.g., Buchel – Frantzeskaki 2015; Kemperman – Timmermans 2006), there has been evidence of urban park use benefits which cover all the psychological, environmental, social, and physical activity domains (e.g., Brown et al. 2018). Therefore, where not possible to build new parks, it is important to optimise other types of public spaces (e.g., small-scale urban greenery, squares) to provide the abovementioned benefits so that the park-typical favourite

functions could be preserved in a neighbourhood and be available to all groups of the population.

The results are a subject of limitations. First, when evaluating different importance of the facility types, the visitation frequency can be biased by the personal situation of the participants (e.g., whether the elderly are grandparents and to what extent they participate in school commuting or play time of their grandchildren). Second, parameters of the facilities were not considered in the research (e.g., size of the grocery stores, number of connections from the bus stops and railway stations). Another limitation pertains to the fact that participants were asked to state their visitation frequency of urban facilities during the pandemic measures. During the COVID-19 pandemic, the elderly in Slovakia were asked to minimise their activities outside their homes as well as social contacts, and, as found by Čuláková et al. (2022), 53.6% of Slovak consumers changed their shopping behaviour. Such changes may have affected the visitation frequency data used in this study. Finally, this analysis only targeted a specific area, and thus, the results cannot be generalised to other environments with different economic statuses and cultures. In addition, areas in the town (e.g., residential, industry) were not distinguished when creating the model. However, the study contributes to the existing knowledge by examining accessibility to facilities by especially vulnerable group living in especially vulnerable peripheral town suffering from low economic activity of individuals, negative migration balance, and ageing of its population, together with absent intraurban public transport.

In summary, the inaccessibility to preferred facilities confirms the paradigm of the elderly facing not only social and spatial injustice but also transport-related exclusion (e.g., Hine – Mitchell 2001; Papa et al. 2018) According to a study examining the elderly in a Czech rural environment, the inaccessibility to important services, together with lack of transport opportunities *"not only endanger the fulfilment of their daily needs but also challenge their sense of belonging to their localities and the wider society that might be seen as failing to respond to their emotional, social, and material needs."* (Galčanová – Staveník 2020: 351). Importantly, public spaces are places for effective social inclusion of elderly, due to opportunities for social interactions (Rochovská et al. 2017). However, in later life, the activity space of the elderly narrows depending on their finances and physical abilities (Temelová – Dvořáková 2012). Therefore, areas surrounding the homes of older adults together with urban facilities located there should become increasingly important as it is often the only environment they are moving around within.

In this study, the elderly individuals were examined. However, there are other vulnerable groups for who longer distance is a barrier in their everyday activities. These are individuals, who face various constraints and therefore are not able to reach remote destinations (e.g., parents with children, physically or mentally impaired persons). All these groups need to have urban destinations within a short walking distance. As shown in this paper, problems emerged particularly in areas, where facilities of daily needs were absent. Additionally, in our society, spatial distribution that could be described as "one facility type in one place" is common (e.g., concentration of large food stores in one place), which is suitable for car-owners only, while neglecting other individuals. In the case of facilities, whose placement is controlled by municipalities (e.g., public library, senior club), it would be beneficial to relocate them in more places in town to ensure access for more individuals.

In the future, researchers could focus on conducting more in-depth examinations of the processes which prevent vulnerable groups from reaching important facilities, as well as assessing the resulting consequences.

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REFERENCES

ASSAM SOFTWARE, 2023: Locus GIS [online]. Accessed 11th February 2023. Available at: https://www.locusgis.com/#functions

AZMI, D. I. – KARIM, H. A. – AMIN, M. Z. M., 2012: Comparing the walking behaviour between urban and rural residents. Procedia-Social and Behavioral Sciences 68: 406-416. DOI: https://doi.org/10.1016/j.sbspro.2012.12.237

BANISTER, D. – WATSON, S. – WOOD, C., 1997: Sustainable cities: transport, energy, and urban form. Environment and Planning B: Planning and Design 24(1): 125-143. DOI: https://doi.org/10.1068/b240125

BERTOLINI, L. – LE CLERCQ, F. – KAPOEN, L., 2005: Sustainable accessibility: a conceptual framework to integrate transport and land use plan-making. Two test-applications in the Netherlands and a reflection on the way forward. Transport Policy 12(3): 207-220. DOI: https://doi.org/10.1016/j.tranpol.2005.01.006

BILKOVÁ, K. – KRIŽAN, F. – BARLÍK, P. – HORŇÁK, M. – ZEMAN, M. – ZUBRICZKÝ, G., 2017: Za nákupom ďaleko: rurálne potravinové púšte na Gemeri. Geografický časopis 69(1): 3-20.

BRAND, C. – DONS, E. – ANAYA-BOIG, E. – AVILA-PALENCIA, I. – CLARK, A. – DE NAZELLE, A. – GASCON, M. – GAUPP-BERGHAUSEN, M. – GERIKE, R. – GOTSCHI, T. – IACOROSSI, F. – KAHLMEIER, S. – LAEREMANS, M. – NIEUWENHUIJSEN, M. J. – ORJUELA, J. P. – RACIOPPI, F. – RASER, E. – ROJAS-RUEDA, D. – STANDAERT, A. – STIGELL, E. – SULIKOVA, S. – WEGENER, S. – PANIS, L. I., 2021: The climate change mitigation effects of daily active travel in cities. Transportation Research Part D: Transport and Environment 93: 102764. DOI: https://doi.org/10.1016/j.trd.2021.102764

BROWN, G. – RHODES, J. – DADE, M., 2018: An evaluation of participatory mapping methods to assess urban park benefits. Landscape and Urban Planning 178: 1831. DOI: https://doi.org/10.1016/j.landurbplan.2018.05.018

BUCHEL, S. – FRANTZESKAKI, N., 2015: Citizens' voice: A case study about perceived ecosystem services by urban park users in Rotterdam, the Netherlands. Ecosystem Services 12: 169-177. DOI: https://doi.org/10.1016/j.ecoser.2014.11.014

BYLES, J. E. – LEIGH, L. – VO, K. – FORDER, P. – CURRYER, C., 2015: Life space and mental health: a study of older community-dwelling persons in Australia. Aging & Mental Health 19(2): 98-106. DOI: https://doi.org/10.1080/13607863.2014.917607

ČULÁKOVÁ, K. – BILKOVÁ, K. – KRIŽAN, F. – DANIELOVÁ, K. – HENCELOVÁ, P., 2022: Dosah pandémie COVID-19 na zmeny v nákupnom správaní spotrebiteľov na Slovensku. Sociológia 54(5): 385-411. DOI: https://doi.org/10.31577/sociologia.2022.54.5.14

EIZENBERG, E. – JABAREEN, Y., 2017: Social Sustainability: A New Conceptual Framework. Sustainability 9(1): 68. DOI: https://doi.org/10.3390/su9010068

EK, K. – WÅRELL, L. – ANDERSSON, L., 2021: Motives for walking and cycling when commuting–differences in local contexts and attitudes. European Transport Research Review 13(1): 1-12. DOI: https://doi.org/10.1186/s12544-021-00502-5

GALČANOVÁ, L. – STAVENÍK, A., 2020: Ageing in the changing countryside: The experience of rural Czechs. Sociologia Ruralis 60(2): 329-356. DOI: https://doi.org/10.1111/soru.12292

GAUVIN, L. – RICHARD, L. – KESTENS, Y. – SHATENSTEIN, B. – DANIEL, M. – MOORE, S. D. – PAYETTE, H., 2012: Living in a Well-Serviced Urban Area Is Associated With Maintenance of Frequent Walking Among Seniors in the

VoisiNuAge Study. The Journals of Gerontology Series B: Psychological Sciences and Social Sciences 67B(1): 76-88. DOI: https://doi.org/10.1093/geronb/gbr134

GESS, J., 2016: Social justice in counselor education: Teaching advocacy across the core. Journal of Counselor Leadership and Advocacy 3(2): 124-134. DOI: https://doi.org/10.1080/2326716X.2015.1133334

GUY, C. – DAVID, G., 2004: Measuring physical access to "healthy foods" in areas of social deprivation: a case study in Cardiff. International Journal of Consumer Studies 28: 222-234. DOI: https://doi.org/10.1111/j.1470-6431.2003.00340.x

HASELSTEINER, E. – SMETSCHKA, B. – REMESCH, A. – GAUBE, V., 2015: Time-use patterns and sustainable urban form: A case study to explore potential links. Sustainability 7(6): 8022-8050. DOI: https://doi.org/10.3390/su7068022

HAUGEN, K., 2011: The advantage of „near": Which accessibilities matter to whom? European Journal of Transport and Infrastructure Research 11(4): 368-388. DOI: https://doi.org/10.18757/ejtir.2011.11.4.2941

HAUGHTON, G., 1997: Developing sustainable urban development models. Cities 14(4), 189-195. DOI: https://doi.org/10.1016/S0264-2751(97)00002-4

HINE, J. – MITCHELL, F., 2001: Better for everyone? Travel experiences and transport exclusion. Urban Studies 38(2): 319-332. DOI: https://doi.org/10.1080/00420980020018619

HIRSCH, J. A. – WINTERS, M. – CLARKE, P. – MCKAY, H., 2014: Generating GPS activity spaces that shed light upon the mobility habits of older adults: a descriptive analysis. International Journal of Health Geographics 13(1): 1-14. DOI: https://doi.org/10.1186/1476-072X-13-51

CHEN, J. C. – TSAIH, L. S. – LI, Y., 2019: Exploring views on communal amenities and well-being in housing for seniors in Taiwan. Building Research & Information 48: 1-15. DOI: https://doi.org/10.1080/09613218.2019.1674626

IVESON, K., 2011: Social or spatial justice? Marcuse and Soja on the right to the city. City 15(2): 250-259. DOI: https://doi.org/10.1080/13604813.2011.568723

JOPP, D. S. – WOZNIAK, D. – DAMARIN, A. K. – DE FEO, M. – JUNG, S. – JESWANI, S., 2015: How could lay perspectives on successful aging complement scientific theory? Findings from a US and a German life-span sample. The Gerontologist 55(1): 91-106. DOI: https://doi.org/10.1093/geront/gnu059

KEMPERMAN, A. D. – TIMMERMANS, H. J., 2006: Heterogeneity in urban park use of aging visitors: a latent class analysis. Leisure Sciences 28(1): 57-71. DOI: https://doi.org/10.1080/01490400500332710

KRIŽAN, F. – BILKOVÁ, K. – KITA, P. – HORŇÁK, M., 2015: Potential food deserts and food oases in a post-communist city: Access, quality, variability and price of food in Bratislava-Petržalka. Applied Geography 62: 8-18. DOI: https://doi.org/10.1016/j.apgeog.2015.04.003

KRIŽAN, F. – ŠVEDA, M. – TARČÁKOVÁ, S. – BILKOVÁ, K. – HENCELOVÁ, P., 2021: Kam do školy? Transformácia a priestorové rozmiestnenie základného školstva v zázemí Bratislavy. In: Šveda, M., Šuška, P. (eds.): Suburbanizácia 2: Sondy do premien zázemia Bratislavy. Bratislava: Geografický ústav SAV, pp.171-194.

LEE, C. – MOUDON, A. V., 2008: Neighbourhood design and physical activity. Building Research & Information 36 (5): 395-411. DOI: https://doi.org/10.1080/09613210802045547

LEONTYEVA, E. G. – KALASHNIKOVA, T. V. – DANILOVA, N. – KRAKOVETCKAYA, I., 2016: Subjective Well-being as a Result of the Realization of Projects of the Elderly's Involvement into the Social Life. The European Proceedings of Social & Behavioural Sciences (EpSBS). Vol. 7: Lifelong Wellbeing in the World (WELLSO 2015), Nicosia, pp. 1-6. DOI: http://dx.doi.org/10.15405/epsbs.2016.02.1

LI, F. – FISHER, K. J. – BROWNSON, R. C. – BOSWORTH, M., 2005: Multilevel modelling of built environment characteristics related to neighbourhood walking activity in older adults. Journal of Epidemiology & Community Health 59(7): 558-564. DOI: http://dx.doi.org/10.1136/jech.2004.028399

MARCUSE, P., 2010: Spatial justice: derivative but causal of social justice. In: Bret, B., Gervais Lambony, P., Hancock, C., Landy, F. (eds.): Justices et Injustices Spatiales, pp. 75-94. Paris: Presses Univeritaires de Paris Ouest.

MARCUSE, P., 2009: From critical urban theory to the right to the city. City, 13(2–3): 185-197. DOI: https://doi.org/10.1080/13604810902982177

NOURIAN, P. – REZVANI, S. – VALECKAITE, K. – SARIYILDIZ, S., 2018: Modelling walking and cycling accessibility and mobility: The effect of network configuration and occupancy on spatial dynamics of active mobility. Smart and Sustainable Built Environment 7(1): 101-116. DOI: https://doi.org/ 10.1108/SASBE-10-2017-0058

PAPA, E. – CARPENTIERI, G. – GUIDA, C., 2018: Measuring walking accessibility to public transport for the elderly: the case of Naples. TeMA-Journal of Land Use, Mobility and Environment 105-116. DOI: https://doi.org/10.6092/1970-9870/5766

PEREIRA, R. H. – SCHWANEN, T. – BANISTER, D., 2016: Distributive justice and equity in transportation. Transport Reviews 37(2): 170-191. DOI: https://doi.org/10.1080/01441647.2016.1257660

PLAUT, P. – SHACH-PINSLY, D. – SCHREUER, N. – KIZONY, R., 2021: The reflection of the fear of falls and risk of falling in walking activity spaces of older adults in various urban environments. Journal of Transport Geography 95: 103152. DOI: https://doi.org/10.1016/j.jtrangeo.2021.103152

PRINS, R. G. – PIERIK, F. – ETMAN, A. – STERKENBURG, R. P. – KAMPHUIS, C. B. – VAN LENTHE, F. J., 2014: How many walking and cycling trips made by

elderly are beyond commonly used buffer sizes: results from a GPS study. Health & Place 27: 127-133. DOI: https://doi.org/10.1016/j.healthplace.2014.01.012

RIŠOVÁ, K. – SLÁDEKOVÁ MADAJOVÁ, M., 2020: Gender differences in a walking environment safety perception: A case study in a small town of Banská Bystrica (Slovakia). Journal of Transport Geography 85: 102723. DOI: https://doi.org/10.1016/j.jtrangeo.2020.102723

RIŠOVÁ, K., 2021: Questioning gender stereotypes: A case study of adolescents walking activity space in a small Central European city. Journal of Transport Geography 91: 102970. DOI: https://doi.org/10.1016/j.jtrangeo.2021.102970

RIŠOVÁ, K., 2022: The Role of Residence Location in the Spatio-Temporal Walking Patterns of Adolescents: A Case Study in the Post-Socialist Town of Banská Bystrica (Central Slovakia). Sociológia, 54(4): 352-375. DOI: https://doi.org/10.31577/sociologia.2022.54.4.13

ROCHOVSKÁ, A. – HORŇÁK, M. – HLUŠKO, R., 2021: Na ceste z chudoby a sociálneho vylúčenia? Dostupnosť pitnej vody v rómskych komunitách na východnom Slovensku. Geographia cassoviensis, 15(1): 71-85. DOI: https://doi.org/10.33542/GC2021-1-05

ROCHOVSKÁ, A. – MAJO, J. – KÁČEROVÁ, M. – ONDOŠ, S., 2017: Priateľské sídlisko alebo o dôležitosti prostredia pre zdravú komunitu seniorov. Geographia Cassoviensis 11(2): 184-200.

ROMERO, M., 2020: Sociology engaged in social justice. American Sociological Review 85(1): 1-30. DOI: https://doi.org/10.1177/0003122419893677

SATTERTHWAITE, D., 1997: Sustainable cities or cities that contribute to sustainable development?. Urban Studies 34(10): 1667-1691. DOI: https://doi.org/10.1080/0042098975394

SHAH, R. C. – MAITRA, K. – BARNES, L. L. – JAMES, B. D. – LEURGANS, S. – BENNETT, D. A., 2012: Relation of driving status to incident life space constriction in community-dwelling older persons: a prospective cohort study. Journals of Gerontology Series A: Biomedical Sciences and Medical Sciences 67(9): 984-989. DOI: https://doi.org/10.1093/gerona/gls133

SCHÖNFELDER, S. – AXHAUSEN, K. W., 2003: Activity spaces: measures of social exclusion?. Transport Policy 10(4): 273-286. DOI: https://doi.org/10.1016/j.tranpol.2003.07.002

SIKDER, S. – PINJARI, A. R., 2012: Immobility levels and mobility preferences of the elderly in the United States: Evidence from 2009 national household travel survey. Transportation Research Record 2318(1): 137-147. DOI: https://doi.org/10.3141/2318-16

SLÁDEKOVÁ MADAJOVÁ, M. – ŠVEDA, M. – VÝBOŠŤOK, J., 2021: Bude miesto pre všetky deti? Kapacita predškolských zariadení v Bratislavskom samosprávnom kraji. In Geografický časopis 73(4): 301-322. DOI: https://doi.org/10.31577/geogrcas.2021.73.4.16

SOJA, E., 2009: The city and spatial justice [online]. Justice Spatiale/Spatial Justice 1 [cit. 10.06.2022] Available at: http://www.jssj.org/wp-content/uploads/ 2012/12/JSSJ1- 1en4.pdf

SOJA, E., 2010: Spatializing the urban, Part I. City 14(6): 629-635.

SOLÁ, A. G. – VILHELMSON, B. – LARSSON, A., 2018: Understanding sustainable accessibility in urban planning: Themes of consensus, themes of tension. Journal of Transport Geography 70: 1-10. DOI: https://doi.org/10.1016/j.jtrangeo.2018.05.010

STRAWBRIDGE, W. J. – COHEN, R. D. – SHEMA, S. J. – KAPLAN, G. A., 1996: Successful Aging: Predictors and Associated Activities, American Journal of Epidemiology, 144(2): 135-141. DOI: https://doi.org/ 10.1093/oxfordjournals.aje.a008900

SUNG, H. – GO, D. – CHOI, C. G. – CHEON, S. – PARK, S., 2015: Effects of street-level physical environment and zoning on walking activity in Seoul, Korea. Land Use Policy 49: 152-160. DOI: https://doi.org/10.1016/j.landusepol.2015.07.022

SZÉKELY, V. – NOVOTNÝ, J., 2022: Public transport-disadvantaged rural areas in relation to daily accessibility of regional centre: Case study from Slovakia. Journal of Rural Studies 92: 1-16. DOI: https://doi.org/10.1016/j.jrurstud.2022.03.015

TEMELOVÁ, J. – DVOŘÁKOVÁ, N., 2012: Residential satisfaction of elderly in the city centre: The case of revitalizing neighbourhoods in Prague. Cities 29(5): 310-317. DOI: https://doi.org/10.1016/j.cities.2011.11.015

TREMBOŠOVÁ, M. – KOHUTIAR, S., 2022: The impact of public transport on regional development in the Trnava self-governing region. Prace Komisji Geografii Komunikacji PTG/ Transport Geography Papers of Polish Geographical Society 25(2): 18-26. DOI: https://doi.org/10.4467/2543859XPKG.22.007.16265

TREMBOŠOVÁ, M. – JAKAB, I., 2021: Spreading of Food Deserts in Time and Space: The Case of the City of Nitra (Slovakia). Sustainability 13(13): 7138. DOI: https://doi.org/10.3390/ su13137138

UNITED NATIONS, D. O. E. A. S. A., POPULATION DIVISION., 2019: World urbanization prospects: 2018 revision. New York: United Nations.

VAN HOOF, J. – KAZAK, J. K., 2018: Urban ageing. Indoor and Built Environment 27(5): 583-586. DOI: https://doi.org/10.1177/1420326X18768160

WINTERS, M. – VOSS, C. – ASHE, M. C. – GUTTERIDGE, K. – MCKAY, H. – SIMS-GOULD, J., 2015: Where do they go and how do they get there? Older adults' travel behaviour in a highly walkable environment. Social Science & Medicine 133: 304-312. DOI: https://doi.org/10.1016/j.socscimed.2014.07.006

ZEITLER, E. – BUYS, L., 2015: Mobility and out-of-home activities of older people living in suburban environments:'Because I'm a driver, I don't have a problem'. Ageing & Society 35(4): 785-808. DOI: https://doi.org/ 10.1017/S0144686X13001086

ZIMMER, Z. – CHAPPELL, N., 1997: Chapter 8. Rural-Urban Differences in Seniors' Neighbourhood Preferences. Journal of Housing For the Elderly 12(1-2): 105-124. DOI: https://doi.org/10.1300/J081v12n01_08

ZITO, G. A. – CAZZOLI, D. – SCHEFFLER, L. – JÄGER, M. – MÜRI, R. M. – MOSIMANN, U. P. – NYFFELER, T. – MAST, F. W. – NEF, T., 2015: Street crossing behavior in younger and older pedestrians: an eye-and head-tracking study. BMC Geriatrics 15(1): 1-10. DOI: https://doi.org/10.1186/s12877-015-0175-0