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## Gender and age differences in the travel behavior – a Novi Sad case study

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### Abstract

This work presents the results obtained by analyzing behavior patterns of transport users in Novi Sad (Republic of Serbia) with respect to their gender and age. Novi Sad is the second largest city in the Republic of Serbia, and is recognized as a regional administrative, commercial, tourist and cultural center. In addition to its favorable geographical, topographical and climatic conditions, its street and public transport network has considerably developed in recent decades, while its innermost districts have a well developed network of bicycle paths. Presently, the city is characterized by extremely high participation of non-motorized trips (about 48%) and approximately equal contribution of public transport and private vehicles to the motorized travel volume. The aforementioned analysis utilized the information sourced from the NOSTRAM database and the Novi Sad Transport Model. In order to form such a comprehensive database of daily activities, a series of traffic surveys was carried out (household surveys, surveys on the outer cordon, public transport passenger counting, parking space utilization monitoring, etc.). Statistical analysis of the household survey data enabled a comparison of the male and female core travel characteristics. The same methodology was subsequently employed in comparing travel characteristics pertinent to different age groups (children, teenagers, students, working-age population represented by several categories, and pensioners). Data analysis revealed gender differences in the utilization of various transport modes, as well as with respect to travel purpose and daily distribution of key activities. It can be said that, due to the traditional societal values and poor economic conditions, women tend to use passenger car less frequently than men do. The results related to different age groups prompted a discussion on transport accessibility to various population strata and employment level as the potential causes of the observed patterns and low mobility among children.

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The contribution of this paper is multifaceted, as it provides valuable information for further social and traffic studies, as well as for the creation of sustainable mobility plans for Novi Sad. The patterns revealed here can be applied in the development of mobility schemes of other regional cities characterized by similar economic development and cultural-historical heritage. The value of this work is reflected in the creation of a solid basis for the definition of mathematical models of transport demand and identification of transport policy measures directed toward sustainable mobility.

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## 1. Introduction

When the population that is free and able to travel is examined, it is easy to discern the diversity in their trip characteristics, allowing patterns in the travel motives and purposes to emerge. In addition, by exploring the number of trips an individual or a group of people make in a particular period of observation, the concept of mobility emerges as the essential trip characteristic, manifested to a lesser or greater extent through certain indicators.

Determining the mobility levels of the Novi Sad residents (the second largest city in terms of population in the Republic of Serbia) necessitates close observation and monitoring of its trip patterns. Transport planning is becoming increasingly prominent and complex field of study, both in the urban activities of a city and at the state level. Thus, it has been on the agenda of the powerful state entities entrusted with the adoption of directives and promotion of the field of transport at the highest level. For the purpose of transport planning, the data is usually obtained (collected) through public and/or internal transport studies. This information is subsequently examined and sorted, before being used to form a single database that is further processed statistically according to the expert (transport) instructions.

Historically, the practice of transportation planning in Serbia and world-wide focused on comprehensive land use and transportation planning based on formal procedures - model development and application. The experiences in application of analytical methods of transport system planning and management in most Serbian cities and those of the former Yugoslavia date back to the early 1970s when the Land Use and Transportation Studies were made for the purposes of producing Master Plans by application of computer technologies and transport models (Jović and Depolo, 2011; Basarić et al., 2015). Up to the mid-1970s a large number of household origin-destination surveys, using a simple random technique were undertaken in Serbian urban areas. Long term transportation plans were city urban planners' vision, often containing development plans of city transport network within Master Plans in accordance with the growing demands of passenger car users. The current principal shortcoming of Serbian city practices is the lack of transport development strategy and nonexistence of a complete and updated database on transport system supply and demand characteristics.

This work is based on an relatively new study that aimed to establish travel patterns and purposes of the Novi Sad residents. Its findings have led to the need to conduct further research focusing on everyday mobility of the seemingly the same city population that is nevertheless different in terms of socio-economic characteristics, work/study commitments and general behaviour. Therefore, the present study comprised of the selection and processing of the pertinent data as a function of gender and age of the Novi Sad residents, who took part in the earlier survey conducted as a part of the transportation study NOSTRAM.

The need to conduct a study specifically examining travel characteristics of citizens separated into gender and age groups emerged, owing to the modern trends in transport research conducted in Europe and elsewhere in the world, which have thus far not been followed in the local transport studies. The Eurobarometer survey (EC, 2007), which provides gender-disaggregated data on modal split in the European Union, provides a clear indication of gender differences in relation to utilization of different transport modes. According to this source, a higher proportion of men travel by car and motorcycle relative to women, who in turn walk and use public transport and bicycles more than men do (**Table 1**). Literature review also revealed that, compared to men, women tend to have values that are more environment-focused, as well as hold more positive views of speed limits and congestion fees, and other initiatives geared towards the promotion of a more sustainable transport system. Gender differences in socio-economic and demographic conditions are at the basis of women's lower ability to own and use a car. Extant

evidence also suggests that women travel in cars more frequently as passengers rather than as drivers (CIVITAS, 2014).

Table 1. Gender differences by modal split in the EU-27 (EC, 2007).

|              | Car  | Public transport | Walking | Bicycle | Motorcycle | Other |
|--------------|------|------------------|---------|---------|------------|-------|
| <b>EU 27</b> | 51.4 | 20.6             | 14.7    | 8.7     | 1.8        | 2.7   |
| <b>Men</b>   | 57.5 | 18.0             | 10.2    | 8.3     | 3.3        | 2.7   |
| <b>Women</b> | 45.8 | 23.1             | 18.8    | 9.1     | 0.5        | 2.7   |

Available statistics pertaining to selected European countries underline that women tend to travel less for work (commuting and business) than men do. These differences are particularly pronounced in countries (i.e., Italy, Spain) traditionally characterized by higher gender disparities in the level of labor market participation. By contrast, the female population clearly tends to travel more frequently for purposes of shopping, escorting family members, household management, and so on (CIVITAS, 2014).

While men often display standard and linear travel patterns (to and from workplace, without interruptions), women frequently have shorter travel patterns and more complex travel chains. Using the data yielded by the research on the travel characteristics in the US, McGuckin and Nakamoto (2004) observed gender differences in the mobility level, the distance covered and trip duration. When conducting these comparisons, the authors segregated the respondents by gender, in addition to forming groups including those that have no children, have a small child, or a school-aged child (teenagers).

In all categories based on the child's age, women were shown to have greater mobility, while covering shorter distances in individual trips, relative to men. The authors introduced the concept “trip chain” when describing regular (daily) travel, such as leaving the house to travel to work and later returning home. Their results revealed that women tend to stop more frequently during the execution of their daily “trip chain”, to allow the passengers or the driver to embark/disembark, or to perform everyday purchases and use services required to meet household needs. Similar results were reported by Li and coworkers (2004), who noted that men tend to travel for longer periods and cover greater distances in the morning peak hour, while working women are more likely to stop during their regular trips to work and on the return journey home, especially if they have to care for children and the household. Research conducted in California revealed that unemployed mothers are generally more mobile than their male counterparts in the same situation (Gossen and Purvis, 2004).

Since the beginning of the 21st century, according to the data pertinent to the territory of Europe, the number of female drivers increased by 3.5% and continues to grow in relation to the 1990s. SARTRE program (Social Attitudes to Road Traffic Risk in Europe) conducted a series of surveys to examine the behaviors and attitudes of drivers, reporting that women are more compliant with the traffic regulations and the road traffic safety laws than men are. In addition, women are less likely to cause traffic accidents, and suffer fewer fatalities as a result of the same. With respect to the number of female drivers, Serbia lags behind most European countries. More specifically, Serbia has the lowest percentage of registered women drivers of passenger cars (27%) and motorcycles (4%), compared to, for example, Austria (with 48% and 14%, respectively), Germany (43% and 12%) and the Netherlands (52% and 26%) (EC, 2014).

In Europe, the demographic distribution is shifting toward greater percentage of the elderly relative to the younger population. This ageing population is increasingly diverse with regard to age distribution, socio-economic status, health and household structure. The expected consequences highlight potential mobility and traffic safety considerations (CONSOL, 2013). In relation to sustainability and mobility patterns, older generations are generally less mobile and their number and duration of daily journeys tend to decline after the age of 60, and particularly after 75 (EP, 2012). Mobility is more restricted for older women than it is for men of comparable age. Rosembloom's (2006) study based on the data sourced from the National Household Travel Survey pointed out that older women travel less and for shorter distances than older men and often use alternatives to passenger car. When analysing transport needs in old age, Buck (2005) found that the main concerns for older people are crime and accessibility. In particular, fear of violence and aggression makes older women less willing to travel after dark, especially by public transport, making cars their preferred choice. The Scottish Household Survey also investigated travel patterns by age

and gender, revealing that women use buses more frequently than men do, irrespective of their age. On the other hand, this transport mode is least popular for both genders in the 25-59 age category. Similarly, while there is little difference between women and men regarding travel purposes, women aged 60-69 shop more often than their male counterparts (He et al. 2012). Available statistics in selected European countries show that, for example, in Austria, walking is the preferred mode of transport for the elderly, followed by driving, while this order is reversed in Sweden and the Netherlands. In France, car is the dominant transport mode for older age groups and, while its usage decreases from age 65, it remains prominent. In the Czech Republic, passenger car is the most important transport mode for all age groups, while no data is given regarding access differences across age groups. In all aforementioned countries, with the exception of Netherlands, cycling is of minor importance (CONSOL, 2013).

The paper presents the data and results pertaining to the basic trip characteristics, as a function of gender and age structure of the population of Novi Sad, which will serve as input for the development of mathematical transport models. Significance of the analysis of resident mobility trends according to gender and age structure is reflected in the implementation of the results in traffic studies, as well as their usage in future mobility plans and frameworks.

## 2. Study area and methodology

The aim of this work is to identify the key travel characteristics in Novi Sad, according to gender and age of its population. Novi Sad (a city with 280 000 inhabitants, occupying an area of 129.4 km<sup>2</sup>) is one of the important cities of the Danube region. Due to its favorable geographic position and good transport links, it has become a dominant socioeconomic center of Vojvodina and a unique macro-regional and administrative part of the Republic of Serbia. It is the second largest city in Serbia, home to significant scientific, research and development, and professional organizations, as well as numerous medical, cultural, and educational institutions.

Due to comprehensive research initiatives on passenger and freight movement characteristics (home interviews, external cordon interview and traffic counting) in the area of the town of Novi Sad in 2009, a transport demand and supply database was formed: **NOvi Sad TRANsportation Model – NOSTRAM** (Urbanism Public Enterprise, 2009). Home Interview or Household Survey are the most expensive and difficult type of survey but offer a rich and useful data set (Ortuzar and Willumsen, 2011). Personal interviews were used to collect data for one day (weekday) at the maximum level of disaggregation based on a geographical information system. Survey was divided into two parts:

- Personal and household characteristics and identification – questions designed to classify the household members according to the relation to the head of the household, sex, age, possession of a driving licence, educational level...
- Trip data- all trips made by household members older than 6.

Based on the NOSTRAM transport model data, within the total scope of the road transport using the city's road and street network, passenger car journeys dominate (with 80% participation) compared to the bus and truck transportation. Approximately 80 000 motor vehicles are registered in the city area. Compared to 1971, when previous extensive research was conducted, the number of registered passenger cars has increased by nearly 60%. A set of social and economic changes unavoidably led to the increase in the total number of journeys—over 30% in the period 1976 – 2009. In the same period, a change in the modal split also occurred, marked by significant increase in the number of trips made by passenger cars, accompanied by the corresponding decrease in public transport use. The data used in the analyses were obtained from the household survey conducted in order to investigate the travel habits, behaviors and needs of the Novi Sad residents, which was necessary for the creation of the transport model of Novi Sad - NOSTRAM (Urbanism Public Enterprise, 2009), among other uses. Among the 303 traffic zones in the urban area of Novi Sad and the Veternik suburb, no dwellings or residents were registered in 58, or the registered number was too small, thus preventing inclusion in the analysis, due to the need to apply partial proportionality. In other words, as these zones were not included in the household sample that required the members to keep the travel diary, no initial trips exist for this subgroup.

Data collection was performed using two semi-standardized questionnaires, one for the household and one for its members, which also included a 24-hour travel diary. In addition to the questionnaires and diaries, all household members who kept the diary were given a trip reminder, which they used, with assistance from the field researchers, to complete the diary. The survey excluded trips made by household members younger than 6 years of age did not involve collection of data on the movement of these household members. Field data collection was conducted in

April 2009 and consisted of three steps. In the first step, field researchers conducted an interview with the household member who was able to answer the questions included in the household questionnaire. During this visit, field researchers also conducted interviews with the household members, using the household members' questionnaire, after which they explained how travel diary is to be kept during the next working day, using the trip reminder. On the third day of the data collection phase, which was the day immediately following the date on which the diary was kept, the household members were assisted by the field researchers in completing their respective travel diaries. The diary was kept on Mon-Thu only. The household survey NOSTRAM included 104 questions, while the individual questionnaire comprised of 127 items. If the respondent performed at least one trip, he/she was required to respond to further 10 questions, as each trip was described using 10 questions included in the individual questionnaire (the diary).

The study involved 4,147 households residing in 245 traffic zones, comprising of total 11,016 members, of whom 8,640 kept the trip diary. Once the data was collected, it was augmented by the addition of the household survey data pertaining to the entire Novi Sad area, thus obtaining information on the movement of all residents. The applied methodology yielded data on the basic travel characteristics in Novi Sad, with respect to mobility, trip distribution by mode of transport as well as purpose (motive), and temporal distribution (usually within 24 hours). The book No. 3 "Household survey", i.e., the data set and observations from the household surveys, served as a source of data for the analyses conducted in this study. The work presented here is based on the selected and processed answers given by the survey respondents (Novi Sad residents) in their "travel diary". Basic travel characteristics were determined in terms of gender and the age (grouped into eight categories). The first category of the surveyed population, according to the division by age, comprised individuals aged 6 to 15 years, assumed to be primary school students. The next category comprised of residents aged 16 to 18 years (high school students). The next category (19 to 25 years) mostly constituted students. The following four categories covered 10-year intervals, comprising of working-age middle-aged population (employed and unemployed). The final category included all respondents aged 65 and older, declared as pensioners.

### 3. Study results

The analysis of the expanded survey data set revealed that 744,745 trips (by all transport modes, including walking) were made on an average workday in 2009, in the area covered by the Novi Sad General Plan (GP). According to the household survey, Novi Sad resident mobility on an average workday in 2009 corresponded to 2.65 trips/day/per capita. Almost half of the journeys were performed on foot or by bike. The trips made by public transport and passenger car contributed by 21.5% and around 26%, respectively. Moreover, 42% of these trips were routine commutes to and from home, which implies a return from travel to other destinations, mostly with the purpose of going to work, school, and university, but including other less regular purposes, such as shopping, visits to friends/family, recreation, entertainment, etc.

Based on the temporal trip distribution, morning and afternoon peak hour were introduced into the analyses. The findings revealed that the greatest number of trips in relation to the overall movement (approximately 62,000) are carried out in the period from 07:00 to 08:00, which is thus chosen as the morning peak hour. Similarly, the largest number of movements takes place in the afternoon period from 15:00 to 16:00 (approximately 58,000), corresponding to greater traffic congestion during this period, which is chosen as the afternoon peak period.

#### 3.1. The key travel characteristics in Novi Sad as a function of gender

When classified by gender, 48.88% of the total trips made in the investigated period were made by men, and the remaining 51.12% by women. On the day for which the travel diaries were kept by the respondents, 7.13% and 5.74%, respectively, of the surveyed women and men made no trips. The results also revealed that a greater percentage of men were employed and mobile (which applies to Serbia as a whole). Given that some women are housewives, they are less mobile, as their need for regular daily commute is reduced. On the other hand, when the overall sample was analysed, the average number of daily trips was similar for both genders (3 trips/day). Similar findings also related to the average journey duration, with 16.16 minutes for men, and 17.34 minutes for women. **Figure 1** depicts temporal travel distribution by gender, revealing only minor differences. The main discrepancies



arise in the morning hours (08:00 to 11:00), when women made greater number of trips than men, most likely for shopping purposes.

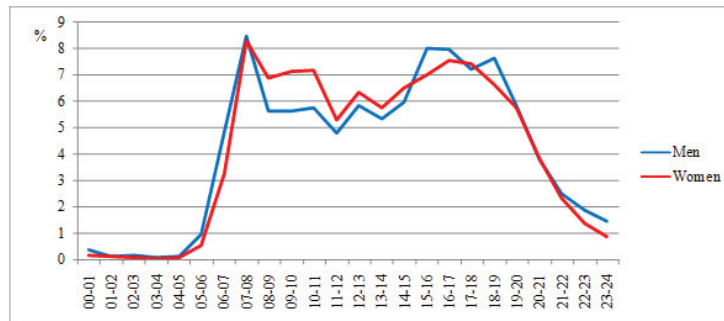


Fig. 1. Temporal travel distribution by gender.



Fig. 2. Travel distribution by gender and purpose over a 24-hour period.

Commute to work/school/university and subsequent return home (to the respondent's place of residence) are considered the primary travel purposes; thus, it is not surprising that the study participants of both genders made most of their trips in this category (42.61% of men and 42.63% of women, as shown in **Figure 2**). Nonetheless, a greater percentage of men (15.02% of daily trips) than women (10.48%) travel to work. In addition, in the entire 24-hour period to which the survey pertained, women made a greater number of shopping trips (13.55%) relative to men (8.24%). When the morning peak period (07:00 - 08:00) is considered, 10% more men travel to work during this time than do women, in line with the NOSTRAM data indicating that a greater number of male Novi Sad residents are employed. A considerable number of shopping trips are also made by women in this period (12.07%), while men make only 8.38% trips for this purpose during the morning peak hour. When the same analysis was applied to the afternoon peak period (15:00 - 16:00), the greatest contribution in the total volume of trips is made by return commute home. As greater number of men travelled to work in the morning, it is logical that they return home during this period in greater numbers. Again, given that some women stay at home taking care of children, they make a greater number of shopping trips in this peak period than men do. It is, however, interesting to note that three times more women than men travel to work during this period, as they presumably work afternoon shifts or in private capacity (**Figure 3**). Most daily trips are made on foot, irrespective of gender, even though women walk more than men do, with 54.06% and 40.16% of all daily trips made, respectively (**Figure 4**). This is followed by the use of public transport, which is again used more frequently by women (23.59%) than men (18.27%). However, men prefer to use passenger car (as drivers) when making motorized trips (29.75%), while women make only 8.37% trips as car drivers. Thus, it is not surprising that they are more frequently car passengers (7.56%) relative to men (4.80%). Similarly, women are more likely to use taxi service (3.66%) than are men (1.92%).

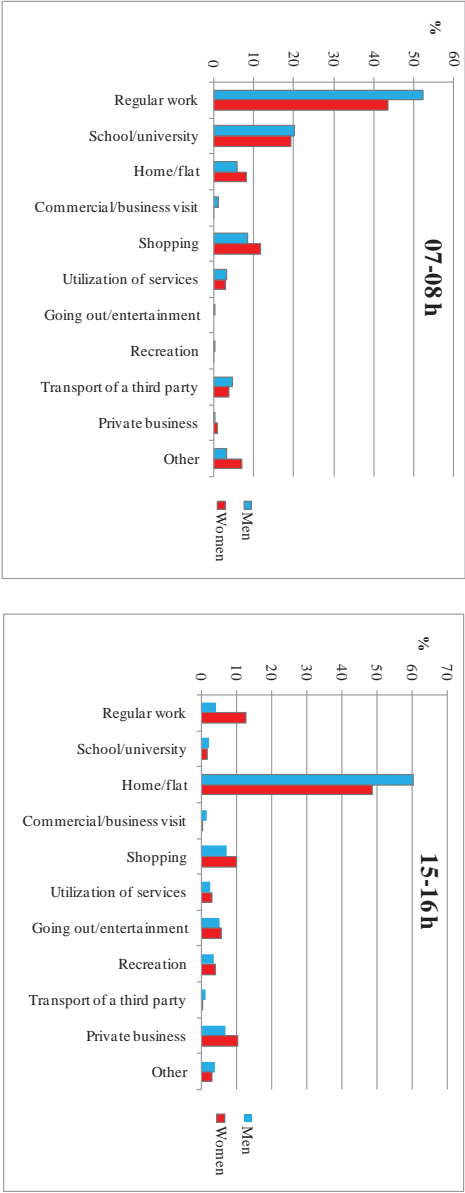


Fig. 3. Travel distribution by gender and purpose (motive) for peak periods.

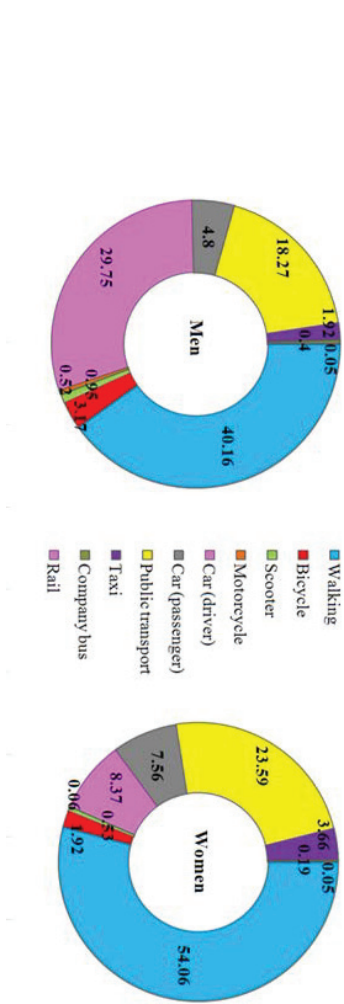


Fig. 4. Travel distribution by gender and transport mode over a 24-hour period.

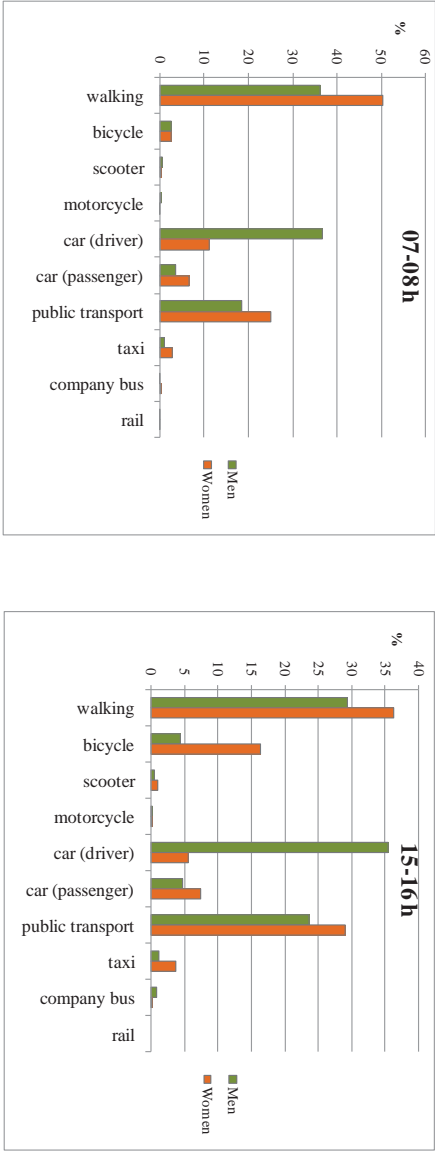


Fig. 5. Travel distribution by gender and transport mode for the peak periods.

In line with the daily travel distribution, in peak periods, a greater number of men use passenger car, especially in the afternoon, when 35.4% of male trips are made by this transport mode, compared to only 5.57% made by women. The most pronounced difference is seen in the use of bicycle, with 16.29% of women and only 4.36% of men using this mode of transport in the peak period (**Figure 5**).

### 3.2. The key travel characteristics in Novi Sad as a function of age structure

The survey findings reveal that mobility declines with age, with the greatest number of trips made by those in the 19 to 35 age group. **Table 2** presents average trip durations for various age categories, revealing that those aged 19 to 25 make the longest journeys (lasting 21.33 minutes on average).

Table 2. Percentage participation and duration of trips made by different age groups, with the corresponding mobility levels.

| Trips   | AGE CATEGORIES [years]: |        |         |         |         |        |         |        |
|---|-------------------------|--------|---------|---------|---------|--------|---------|--------|
|   | 6- 15                   | 16 -18 | 19 - 25 | 26 - 35 | 36 - 45 | 46- 55 | 56 - 65 | + 65   |
| <b>Participation in the surveyed sample</b>                           | 4.83%                   | 1.95%  | 17.35%  | 20.59%  | 13.25%  | 13.53% | 10.84%  | 17.66% |
| <b>Participation of trips realized</b>                                | 4.77%                   | 2.06%  | 19.83%  | 22.21%  | 13.96%  | 13.18% | 10.27%  | 13.72% |
| <b>Participation of those that made no trips in the survey period</b> | 3.86%                   | 4.19%  | 2.88%   | 3.73%   | 3.51%   | 6.19%  | 7.19%   | 16.04% |
| <b>Average trip duration [min]</b>                                    | 12.33                   | 19.69  | 21.33   | 14.76   | 17.91   | 17.39  | 15.63   | 17.57  |
| <b>Mobility [trip/person/day]</b>                                     | 3.02                    | 3.24   | 3.49    | 3.30    | 3.22    | 2.98   | 2.9     | 2.38   |

As previously noted, trips made for the primary purpose of commuting to and from home predominate in all age categories, and contribute to the daily travel by 40% to 47%. When younger age groups are analyzed separately, as expected, it was evident that most of their trips were related to educational purposes. On the other hand, relative to other activities to which the trips realized during the surveyed period related, school-aged respondents engaged in recreation more frequently than did those in secondary school, while individuals in their early twenties tend to go out and socialize more, i.e., make a greater number of trips for the purpose of entertainment. As those aged 25 to 65 are deemed to be of working age, they are expected to work either full- or part-time. However, due to the socioeconomic conditions currently prevailing in Serbia, unemployment rate is high, resulting in a high percentage of those under 35 that are not in regular employment. On the other hand, older age groups and those approaching retirement are more likely to be employed and go to work regularly. While shopping as a trip purpose is present in most age groups, its participation in the daily travel distribution increases with age, while traveling for recreation and entertainment declines. However, the oldest respondents were found to be much more active in this respect relative to their middle-aged counterparts, as they regularly took walks and socialized with other pensioners, visited shops, markets, parks, etc. **Figure 6** depicts the most prominent travel purposes for the analyzed age categories.

The analysis also included usage of the ten transport modes included in the survey, separately for each age category. As expected, due to the city size and accessibility of many important amenities, the greatest proportion of trips are made on foot. Similarly, it is logical that the youngest respondents do not drive cars or ride bicycles, or use corporate buses. Thus, these transport modes are excluded from the travel distribution by transport mode for children. It is also evident that, despite 16 being the lowest age limit for passing the driving test (with the license obtained at 17), those attending secondary school rarely use passenger car as drivers for realizing their daily trips. As the law stipulates that novice drivers must be accompanied by an individual that has held the B-category drivers license for a minimum of five years, this is a likely contributor to this low usage of cars by teenagers. For those in other age groups, an increase in the prevalence in car usage increases with age, whereby those aged 36 to 45 drive cars to realize about 1/3 of all daily trips, making this mode transport even more popular than walking.



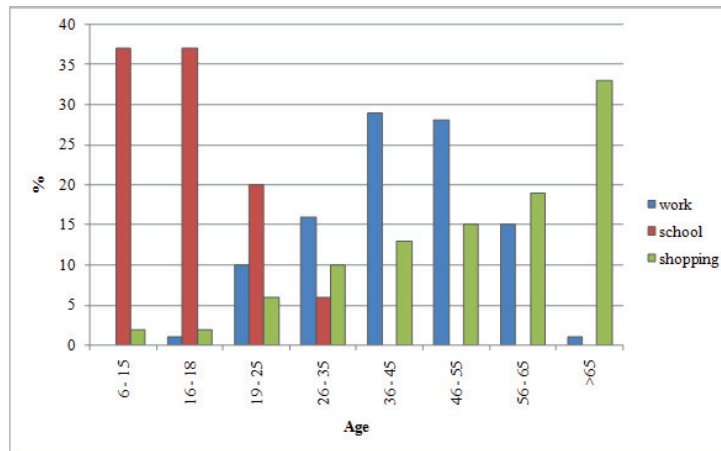


Fig. 6. The most prevalent travel purposes for the analyzed age categories.

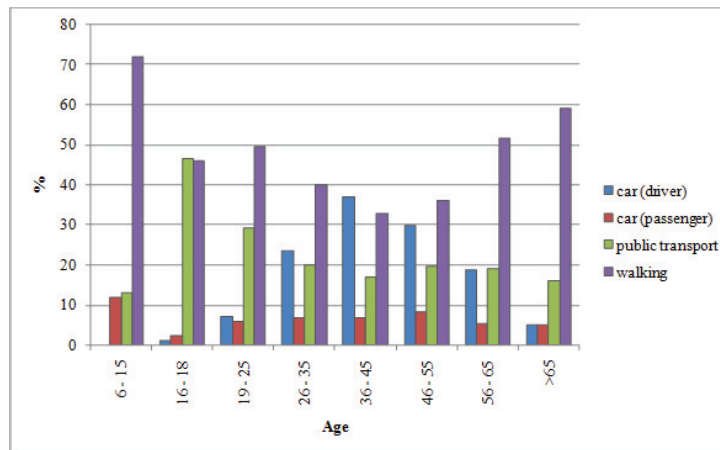


Fig. 7 The most prevalent transport modes by age category.

Public transport features relatively equally in the trip distribution of those older than 26, with about 20% participation. The youngest respondents use public transport the least, while they are most likely to be car passengers. In this age category, 72% of all daily trips are made on foot, with this high percentage justified by the dense network of primary schools that are thus short distance away from most children's homes. Use of buses provided to workers by their employers, as well as rail use, is not prominent in the daily trip distribution for any of the age categories. On the other hand, while not significant, taxi service use features in all age groups. This is justified by affordable price and reliable service offered by several taxi companies operating in Novi Sad. Use of motorcycle as a mode of transport is negligible in all age categories (not exceeding 1% in the daily travel distribution), with a slight increase noted among those aged 26 to 35. Similarly, in the 16-25 age group, use of scooters increases relative to other age categories, while bicycle is the most popular among older Novi Sad residents (accounting for about 3% of trips made by all respondents aged over 25). **Figure 7** depicts the most prevalent transport modes by age category. In terms of temporal travel distribution, it is worth noting that, for children and mature adults, the morning peak period is between 7:00 and 8:00, whereas it is 10:00 to 11:00 for those aged 19 to 25 and elderly. Similarly, for most respondents in full-time education, the afternoon peak period takes place from

13:00 to 14:00, whereas for those of working age and pensioners, it corresponds to 14:00-16:00 and 17:00-18:00, respectively. A third peak period from 19:00 to 20:00 was also identified for teenagers, presumably because this is the time most take trips for recreation/entertainment purposes.

#### 4. Conclusion

The descriptive analysis presented in this work utilized data yielded by the household and individual surveys conducted in 2009, which was evaluated with respect to respondents' gender and age. When the daily travel characteristics were analyzed by gender, no discernible differences in mobility level emerged. On the other hand, it could also be ascertained that a greater percentage of women than men made no trips in the surveyed period, men tend to travel more for work than women do, and use passenger car as drivers four times more. In terms of respondent age, analyses revealed that Novi Sad residents' mobility declines with age. In addition, while those aged 19 to 35 make the greatest number of daily trips, those in the 16-18 age category and pensioners are least mobile. Owing to the harsh socioeconomic conditions resulting in high unemployment rate, a significant proportion of those aged 26 to 35 do not hold full-time jobs and thus do not regularly travel to and from work. Similarly, the diaries kept by all respondents revealed that very few teenagers engage in regular extracurricular activities. On the other hand, in comparison with the respondents that took part in studies conducted in Europe (**Table 1**), Novi Sad residents of both genders walk significantly more.

This study offered some significant findings, but also opened many avenues for further research using this data set. For example, future analyses could assess travel characteristics as a function of combination of gender and different age categories. The results reported here are particularly valuable for monitoring mobility patterns of various age groups as a part of socio-demographic research. This work has resulted in the creation of a preliminary database, which will be utilized in the development of mathematical transport demand models.

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