

Analysis of Tourist Travel Behaviour for the Train/Bus Transport Service Establishment - The Case of Kopaonik

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Abstract –This paper reports the survey results of tourists' travel behaviour. The case study covers the sample of 1000 adult respondents visiting Kopaonik National Park (Serbia) in the winter season of 2020. The survey results indicate that some integrated train/bus transport services have to be initiated in the future.

Keywords – Travel Behaviour, Passenger, Railway, Transport Service, Tourism.

I. INTRODUCTION

Transport is the key element in tourism industry. Tourism, as an economic activity, relies on transportation to bring tourists to destinations. Transportation itself can be a part of the touristic experience.

Leisure travel demands are a challenge for transport planners. Leisure travel is more concentrated around annual holidays and can be fairly well predicted. A real challenge for most transport planners is accessibility to and within tourist attractions and destinations because accessibility is the ultimate goal of the majority of transport activities.

The sector of travel & tourism is one of the world's largest sectors, driving socio-economic development and job creation. This sector accounted for 10.3% of global GDP (8.9 trillion \$) and 10.4% of total employment (around 330 million jobs) in 2019. The average annual growth rate for the past ten years is 3.5%. This rate is 40% higher than that of the global economy (2.5% overall economy growth) [1]. Europe is the world's largest market, accounting for more than 50% of all tourist arrivals worldwide. One-third of foreign tourist arrivals in Europe are in Southern/Mediterranean Europe (17 countries). The share of the Republic of Serbia in total foreign tourist arrivals in this area is almost statistically irrelevant (around 0.5%). Only three countries have fewer foreign tourist arrivals than the Republic of Serbia (Republic of Bosnia and Herzegovina, Republic of North Macedonia, and Republic of San Marino)[2]. Nevertheless, in the last ten years, travel & tourism has become the sector with the highest growth rate in Serbia (5.0% in 2019), accounted for 5.9% of total GDP. Around 3.7 million tourist arrivals (49.9% domestic and 51% foreign tourists) are registered in 2019. In 2019, compared to 2010, there were 84.4% more tourist arrivals. The number of foreign tourist arrivals rose 2.7 times. Average overnights are 4.2 days [3].

Sustainability is the core of growth in all sectors. Travel &

tourism is an especially vulnerable sector. This sector is highly dependent on many factors and their changes over time, especially on behaviour changes. Therefore, constant monitoring of tourists' travel behaviour is crucial.

It is well-known that accessibility refers to people's ability to reach desired services and activities. Many factors affect accessibility, including mobility, the quality and affordability of transport options, transport system connectivity, mobility substitutes, and land-use patterns. Conventional planning tends to overlook and undervalue some of these factors and perspectives [4].

It is noticed that a significant limitation in the methodology of creating the Tourism Development Strategy of the Republic of Serbia 2016 - 2025 is the lack of current and credible local research of the travel & tourism market, attitudes and opinions of tourists, and relevant entities in the tourism sector [5].

This case study is a small contribution to the efforts in travel & tourism market research. The target group is adult visitors of the Kopaonik tourist resort in the winter period. A special emphasis is put on the origin of tourist and transport mode choice. The main goal of the survey is to obtain valid data for the establishment of a new concept of accessibility to the resort in the form of an integrated train/bus transport service.

II. STUDY LOCATION

Kopaonik Mountain (in further text Kopaonik Mt.) is situated in the southern part of central Serbia, in the Raška and Brus municipalities. The total area of Kopaonik Mt. covers 2758 km². The highest point is the peak Pančičev Vrh (2017 m). Kopaonik Mt. is one of the most important centres of biodiversity of endemic flora in Serbia with a variety of animal species as well. It was recognized and established as an area of exceptional natural value (National Park) in 1981 with three stages of protection. The oldest and largest ski resort in Serbia is located in Kopaonik National Park. It was founded in the 1930s and has been developing rapidly since the 1970s. Today the ski resort has more than 62 km of ski paths and trails (ski lift system 55 km in length with the capacity of 32,000 passengers/hour). Leisure activities on Kopaonik Mt. are walking excursions, sports (biking, basketball, tennis, riding, paragliding, etc.), slimming, fitness, and other programs. Tourist attractions are spas and mineral springs. The most popular destinations are the remains of fortified towns of the medieval Serbian state, as well as churches, monasteries, and other cultural heritage sites.

Kopaonik Mt. is one of the most popular tourist mountain destinations in Serbia. In 2019, around 135,613 visitors (79.2% domestic and 20.8% foreign tourists) and 565,980 overnights are registered [3]. Around 66.8% of overnights are

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registered in the period from late November to the end of March. In the same year, local tourist organization (TO) Raška registered more than 150,000 visitors who stayed for just a day without spending the night in collective or private accommodation (so-called "same-day visitors"). The local TO authorities estimated that there were numbers of not registered visitors. The coefficient of monthly unevenness of tourist visits was extremely large (2.69) in 2019.

Seasonality in the number of tourists on Kopaonik Mt. changed in 2020. The most crowded days in 2020 were: in the winter season the 2nd of January (with 6,500 skiers) and in the summer season the 22nd of August (with 4,400 tourists, mostly domestic) [6]. The rise of domestic tourism in 2020 is the consequence of epidemiological measures due to the coronavirus pandemic.

Seasonality is extremely important in passenger transport planning, especially to and from tourist destinations. It is well known that the data of registered tourists and overnight stay do not provide a complete insight into travel behaviour and distribution. Therefore, at the destination level, for the analysis of seasonality in the distribution of tourists a new approach is needed.

III. ANALYSIS OF THE PRESENT PASSENGER TRANSPORT SERVICE TO KOPAONIK MT.

For traveling to Kopaonik Mt. and ski resort tourists can choose between road and railway means of transportation. Helicopter transportation is also available in certain situations.

Available means of road transportation are:

- scheduled public transport bus service;
- rent-a-car;
- door-to-door private or shared transfers by vehicles with professional drivers: VIP limousines up to 8 passengers, minibus up to 15-20 passengers, minivans up to 8 passengers, or taxi transfer. The service can be organised as a one-way transfer or sightseeing round-trip transfer.

Since the direct railway transportation service to the Kopaonik Mt. ski resort does not exist, an intermodal passenger transport is needed. The nearest railway station is 16.4 km far away (Rudnica railway station). In 2020, only 2 pairs of passenger trains operated daily on the Kraljevo - Kosovska Mitrovica railway line, with planned stops in Rudnica station. The connection with the bus service for transfer to Kopaonik Mt. ski resort was not planned.

A. A historical overview of the rail transport service

If we look into the past six decades, the railway services from Belgrade municipality to the Kopaonik area were poor. In the period from 1950 to 1990, there was one pair of trains operating daily on railway line Belgrade-Skoplje via Kraljevo. The departure time from Belgrade station was 21:55 and the arrival time in Rudnica station was 03:59. Total travel time was 6 hours and 4 minutes.

In the beginning, in 1950, the transfer from the station to the Kopaonik Mt. ski resort was organised by the local

population. Tourists have been transferred by horse or ox wagons with a maximum travel speed of 5 km/h, and a total travel time of over 3 hours in one direction. Later on, a transfer by public bus service was obtained, but the arrival of trains and departure of buses was not adjusted. Tourists waited too long at the bus station.

The first real attempt for the establishment of railway service according to travel demands of skiers was held in the mid of the last decade of the 20th century. The daily rail service named "ski train" operated only for a year, and then was withdrawn.

The malformation of this service was a lack of train/bus transfer time adjustability. The railway company did not make an agreement with local bus operators about the integrated train/bus services. Nevertheless, from that period until today the interest of tourists for traveling by train to Kopaonik Mt. still remains.

IV. SURVEY RESEARCH METHOD AND METHODOLOGY

For this research, a survey methodology and e-questionnaire have been developed. It is based on theoretical approaches to travel behavior and demand analysis such as activity-based approaches, approaches using subjective variables (attitude), approaches using population segmentation, and approaches directly involving choice models.

The e-questionnaire consists of 12 questions in total (multiple-choice and open questions) divided into two sections. The first section consists of 4 questions (general observation of the interviewer such as sex and approximate age of a tourist, place, and time). The second section consists of 8 questions that have to be answered by a tourist. These questions are referring to the following:

- Origin of a tourist (where the tourist comes from);
- Frequency of visits to Kopaonik Mt.;
- Duration of stay;
- Transportation mode in arrival and return to the tourist's origin;
- Factors influencing the mode choice;
- Attitudes of the tourist towards a train/bus integrated transport service;
- Travel quality demands of the tourist.

The primary data were gathered using a face-to-face survey among adult visitors to Kopaonik Mt. The survey respondents were selected using random sampling, and the on-site survey was carried out on a voluntary basis. The survey was conducted over a time period of 4 weeks (from mid-January to mid-February 2020), each day from 10:00 to 16:00, on the most visited sites (in and outdoor leisure & recreational areas).

The data collected by the e-questionnaire (electronic Blaise questionnaire) were transformed and compiled, then converted into SPSS format (SPSS - A software package for statistical analysis). Data collected this way are easy to handle (sort, analyse and present in tables and graphs).

V. THE MAIN RESULTS OF THE INTERVIEW

The pilot survey was performed on the 26th and 27th of March 2016 with a sample of 100 tourists. The results were presented in the Bachelor's degree final project of the student in charge [7].

In the survey, carried out in 2020, a total of 1,000 visitors were interviewed (51% male and 49% female).

Among interviewed 92% were domestic and 8% were foreign tourists.

The age of respondents is given in Table 1.

TABLE I
AGE CLUSTERING OF TOURISTS

Age of tourists	%
under 20	10
20 - 30	29
30 - 40	27
40 - 50	26
over 50	8

The age of the majority of the surveyed tourists is clustering from 20 to 50 years (82%).

The origins of tourists (where tourists come from) are given in Table 2.

TABLE II
ORIGIN OF TOURISTS

Region	%
Belgrade	50
Vojvodina	14
Šumadija	8
Western Serbia	12
Eastern Serbia	1
South Serbia	7
Neighbouring countries	5
Other European countries	2.8
Other countries	0.2

The largest number of tourists (50%) come from the Belgrade region (47% from Belgrade municipality), then 14% from the Vojvodina region (5% from Novi Sad) and 12% from Western Serbia (7% from Kraljevo). The majority of foreign tourists come from the Republic of North Macedonia.

Around 87% of respondents visit Kopaonik Mt. in the winter season, 10% in the winter and summer season, and 3% in the winter and some other season.

The duration of staying for the majority of tourists (43%) is 7 to 10 days. Most of the visits are organized by travel & tourism agencies. The greatest number of tourists prefer one-day visits (3%) or weekend and short holidays visits with 2 or 3 overnights (39%). Around 15% of visitors stay longer than 10 days.

The majority of respondents (88%) for their overnight staying chose hotels or apartments, 9% chose private houses and lodges. On the list, 3% of visitors did not stay overnight.

Of the total number of respondents, 73% came by car, while 27% used public bus transportation.

Attitudes of tourists towards a train/bus integrated transport service show that 38% of respondents are highly interested, 41% are not interested and 21% are indefinite and will show their preferences after the travel service establishment.

Those who are not interested in new integrated transport service specified their reasons as follows:

- car dependency;
- personal travel comfort;
- travel with children and a great amount of luggage;
- other reasons.

Those who are interested or indefinite specified their priority in travel quality demands as follows:

A) Demands toward transport service

- timetable (38%),
- total travel time (26%),
- comfort and internet (22%),
- integrated ticketing and tariffs (6%),
- free door to door luggage service (5%),
- high cleaning standards for vehicles (4%).

B) Demands toward Kopaonik Mt. railway stations (Rudnica and other stations)

- station functionality - the collective function that a station offers to passengers as part of a journey;
- station building services - waiting area, left luggage lockers & offices, dressing and changing rooms with bathrooms, etc.;
- station as a transport hub - extended range of services in addition to services for the journey - restaurants, cafeteria, shops;
- station as a transfer point - more transfer opportunities (variety bus types by capacities, rent a car, rent a motorbike and a bike, rent a vehicle with driver, etc.).

The majority of visitors under the age of 30, who stay one day, have more demands toward timetable and railway station services.

The main demand toward timetable is that arrival and departure time should have seasonal characteristics. In the winter season, arrival and departure times have to be in correlation with lifts & ski trails operation schedule (arrival at the spot at least 1 hour before opening, and departure at least 1 hour after closure). In the summer season, arrival and departure time has to be in correlation with the daylight period (arrival at the spot at least at 10 o'clock and departure time at the most 1 hour before sunset).

The demand toward train running dynamics is that in both seasons long-distance railway passenger service (over 150 km) should be organized 3 times a week (Friday, Saturday, and Sunday), and short distance service (up to 150 km) on a daily basis.

The majority of visitors interested in integrated rail/bus passenger transport services come from Belgrade, Kragujevac, and Kraljevo.

The results of the comparative analysis of distance from the place of origin to Kopaonik Mt. are given in Table 3.

Presented data imply that distance as a travelling parameter is highly competitive.

TABLE III
DISTANCE FROM ORIGIN TO KOPAONIK MT. SKI RESORT

Departure city	Distance (km)		
	Road		Railway+Road
	Car	Bus	Train+Bus
Belgrade	270.2	277.4	271.6
Kragujevac	149.0	163.0	150.4
Kraljevo	101.0	109.0	93.7

The results of the comparative analysis of travel time from origins to Kopaonik Mt. are given in Table 4.

TABLE IV
TRAVEL TIME FROM ORIGIN TO KOPAONIK MT. SKI RESORT IN 2021

Departure city	Time (h,min)		
	Road		Railway
	Car	Bus	Train*
Belgrade	3h 15min	5h 15min	6h 10min
Kragujevac	2h 34min	3h 10 min	3h 48min
Kraljevo	1h 53min	2h 00 min	1h 50min

*travel time has to be extended with the period of time for transfer and travel by bus, from Rudnica station to the resort

The travel time by bus, from Rudnica railway station to Kopaonik Mt. ski resort, is 21 min in the summer season and up to 40 min in the winter season. The transfer time is around 10 min.

Presented data imply that on distances up to 100 km the travel time is competitive. Cars and buses are used on local roads with speed limits, so the average speed is around 53 km/h.

On distances over 100 km, travel time by car is far less than travel time by bus or train.

From Belgrade to the destination, section of the main road can be used, so the average speed is around 83 km/h.

The average speed of buses on all distances is nearly the same. The average speed of trains is highly dependent on conditions of the infrastructure elements, and varies from one section of tracks to another (goes from 40 km/h to 53 km/h).

VI. OPPORTUNITIES & CHALLENGES OF RAILWAY PASSENGER TRANSPORT SERVICE

The rise in demand for railway passenger services is closely related to investments in railway infrastructure driven by the government and to service standards of railway undertakings (RU) and infrastructure managers. Travel demands can put large pressure on the authority in charge.

Leisure tourism spending worldwide had increased steadily since 2015. In 2020, inbound tourism (visits and spending) has declined, and domestic tourism has risen. The presence of rail passenger service on the travel & tourism market is necessary. Consequently, constant transport market research is crucial for the improvement of rail travel service planning. Rail passenger services, which are close to travel demand,

may shift the share of the railways in passenger transport modal split.

The results of this research indicate that there are demands toward integrated rail/bus service. The travelling parameters of such a service could be competitive on the transport market.

The proof for that claim is lying in the plans of the Government of the Republic of Serbia for further investments in the railway infrastructure and vehicles. Therefore, continuous rising of the speed of trains and reduction of travel time can be expected.

VII. CONCLUSION

Accessibility is the main function behind the basics of tourism & transport. The improved transport infrastructure facilities and services have incited tourism, and the expansion of tourism has incited the development of transport infrastructure [8].

In the last ten years, the Government of the Republic of Serbia has made significant progress in the field of transport infrastructure. The investments have covered reconstruction, improvement, and building new capacities in all modes of transport, especially road and railway.

One of the main pillar for the travel & tourism uprising, appointed in the development vision for travel & tourism in the Republic of Serbia, is the continual improvement of the quality of all types of transportation services. A special emphasis is put on enhancing public transport services.

The further actions need to be taken toward continuous monitoring of travel behaviour and demands, and establishment of a high level of cooperation between operators of rail and road public passenger transport.

Local tourism organizations have to be active partners in planning and realizing transport services to, from, and within attractive tourist destinations.

REFERENCES

- [1] Travel & Tourism - Global Economic Impact & Trends 2020, World Travel & Tourism Council, Jun 2020
- [2] Tourism Statistics, Eurostat Statistics Explained, Online publications, March 2021
- [3] STAT database - Tourism, Statistical Office of the Republic of Serbia, 2020
- [4] Evaluating Accessibility for Transport Planning: Measuring People's Ability to Reach Desired Services and Activities, Tod Litman, Victoria Transport Policy Institute, 22 April 2021, www.vtpi.org/access.pdf
- [5] Tourism Development Strategy of the Republic of Serbia 2016-2025, Government of the Republic of Serbia, Ministry of Trade, Tourism and Telecommunications, Belgrade, November 2016
- [6] <https://www.turistickisvet.com/vesti/turizam/rekordan-broj-posetilaca-na-kopaoniku.html>, 5th of October 2020
- [7] N. Pejić, "Mogućnosti uvođenja "ski" voza na relaciji Beograd - Rudnica", Završni rad, Visoka železnička škola strukovnih studija, Beograd, 2016
- [8] J.P. Rodrigue, The Geography of Transport System, Fifth ed., New York: Routledge, 456 pg. ISBN 978-0-367-36463-2