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**Roadside geotourism – an alternative approach to geotourism**

Specific demands of visitors in the sector of tourism have brought definitions of various new and special forms of nature-based tourism, like ecotourism and geotourism, in last decades. This paper presents an alternative approach to geotourism development via its roadside form. The concept of roadside geotourism is adopted from the roadside geology book series which is relatively well known and popular in the United States of America and some other countries, including e.g. Wales or Australia. In this paper, the original concept has been extended based on recently accepted definitions of geotourism and geosite. Expected output of defining this concept should be, similarly to the roadside geology, in the form of roadside geotourism guidebook or brochure of geotourism related sites and places located along or near existing roads accessible by car, bus or bike, as exemplified on selected road from Košice to Rožňava (Slovakia) in this paper.

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## **Introduction**

Land, its form, and structure are primary elements influencing all the aspects of the environment and the life within. So, geological structure and geomorphology of any area in the world significantly affect the occurrence of specific, both fauna and flora, species, possibilities of the land use and regional development resulting from continuously growing demands of the society. With increasing demand of tourists for the quality of offered services and experiences, new special forms of tourism have been defined. Furthermore, as mentioned by Vujičić et al. (2011), relative fast urbanization and other human-initiated factors, which lead to the degradation of the environment, have influenced the sector of tourism towards sustainable and nature-friendly forms of tourism, including e.g. ecotourism or geotourism. Participants within these tourism forms increase their knowledge not only on importance and attractiveness of visited place but also on the vulnerability of the environment and its individual parts. It means that such activities result into a positive impact on the environment and its protection (Štrba et al., 2016). Such approach is well defined and developed within the concept of geotourism (Vujičić et al., 2011) primarily focusing on the abiotic part of the environment, where geosites (sites representing the geological heritage of the Earth) get into the spotlight.

The aim of this article is, based on existing and accepted definitions of geotourism (Hose, 2012; Newsome & Dowling, 2010) and geosites (Reynard, 2004) to introduce special form of geotourism – roadside geotourism which may attract many non-geotourists to pay more attention and appreciate the importance of abiotic part of the environment.

## **Understanding geotourism**

People have appreciated the beauty of the landscape, as a result of different geological processes, for centuries. Many of them have been inspired by the beauty of nature to promote such places to be visited by others. Some of them have understood the importance of individual places visited within local or regional environmental system. This knowledge has led to definitions and establishments of protected areas (national parks, reservations, etc.) with special visitor rules and regulations. As mentioned by Hose (2012), despite of fact that connection between tourism and geology was mentioned in several publications (e.g. Manini & Carlisle, 1974; Jenkins, 1992; De Bastion, 1994; Martini, 1994; Spiteri, 1994) only two decades ago, the need to protect and promote not only living but also abiotic part of the environment resulted into definition of special form of tourism – geotourism.

Hose (1995), for the first time, defined geotourism as “the provision of interpretive and service facilities to enable tourists to acquire knowledge and understanding of the geology and geomorphology of a site (including its contribution to the development of the Earth sciences) beyond the level of mere aesthetic appreciation”. In next years, this definition has been adopted and/or modified by several authors (e.g. Hose, 2000; Joyce, 2006; Dowling & Newsome, 2006). Moreover, other definitions of geotourism and its understanding have been introduced. Sadry (2009) defines geotourism as “a knowledge -based tourism, an interdisciplinary integration of the tourism industry with conservation and interpretation of abiotic nature attributes, besides considering related cultural issues, within the geosites for the general public”. In 2010, Newsome and Dowling introduced recently one of the most cited definitions noting geotourism as “a form of natural area tourism that specifically focuses on landscape and geology. It promotes tourism to geosites and the conservation of geo-diversity and an understanding of Earth sciences through appreciation and learning. This is achieved through independent visits to geological features, use of geo-trails and view points, guided tours, geo-activities and patronage of geosite visitor centers”. Rybár et al. (2010) emphasize broader context of geotourism pointing out that geotourism is “form of tourism based on recognition of geological objects and processes with emphasis on their aesthetical and historical value, and on recognition of technical remnants connected to mining activity (mines, mining, museums, trade routes) and technical and cultural relics of historical mining”. Finally, the most recent definition of geotourism (Hose, 2012) says that it is “the provision of interpretative and service facilities for geosites and geomorphosites and their encompassing topography, together with their associated in-situ and ex-situ artefacts, to constituency-build for their conservation by generating appreciation, learning and research by and for current and future generations”.

Buckley (2003) argues that geotourism is a part of ecotourism. His statement is based on the definition of geotourism given by the National Geographic Society (in Stueve et al., 2002) specifying that geotourism is “tourism that sustains or enhances the distinctive geographical character of a place—its environment, heritage, aesthetics, culture, and the well-being of its residents”. This definition reflects more geographical features of the area rather than geological.

Based on mentioned differences within geotourism definitions and understanding, a team of specialist tried to unify and clear the geotourism concept. In 2011, Arouca Declaration was introduced, saying that geotourism is “tourism which sustains and enhances the identity of a territory, taking into consideration its geology, environment, culture,

aesthetics, heritage and the well-being of its residents. Geological tourism is one of the multiple components of geotourism”. This definition combines both geological and geographical approach. But, as mentioned by Hose (2016), geotourism definition given within the Arouca Declaration fits ecotourism rather than geotourism, as previously assumed by Buckley (2003).

Besides the discussion on geotourism definition and understanding, several special types of geotourism have been introduced in last years: underground geotourism (Garofano & Govovni 2012), rural geotourism (Farsani et al. 2013), urban geotourism (Rodrigues et al. 2011, Ferreira et al. 2012) or health & wellness geotourism (Farsani et al. 2013).

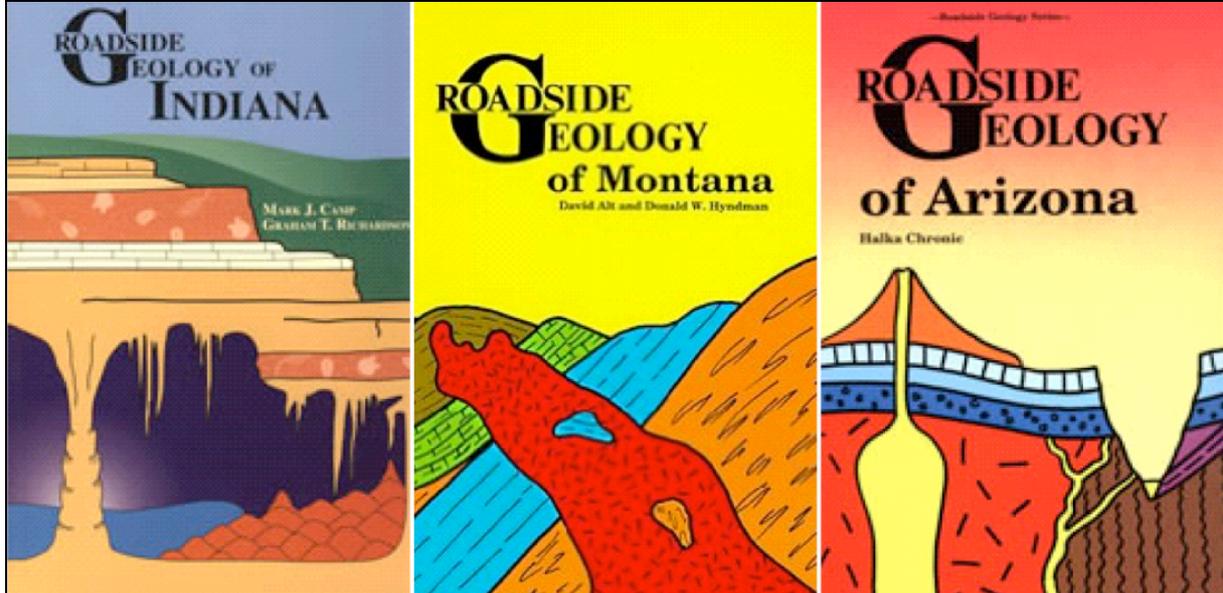
Although there are many different definitions of geotourism introduced yet, almost all of them refer to special, geologically or geomorphologically significant, places – geosites. This term was well defined by Reynard (2004) as “portions of the geosphere that present a particular importance for the comprehension of Earth history. They are spatially delimited and from a scientific point of view clearly distinguishable from their surroundings. More precisely, geosites are defined as geological or geomorphological objects that have acquired a scientific (e.g. sedimentological stratotype, relict moraine representative of a glacier extension), cultural/ historical (e.g. religious or mystical value), aesthetic (e.g. some mountainous or coastal landscapes) and/or social/economic (e.g. aesthetic landscapes as tourist destinations) value due to human perception or exploitation”.

Deriving from above mentioned definitions, it can be summarized that geotourism is, more or less, based on identification, promotion, and protection of geological sites – geosites via research activities, interpretation, and appreciation of geological heritage both in-situ and ex-situ.

### **Roadside geotourism concept**

The concept of roadside geotourism is adopted from the roadside geology book series (Fig. 1). It is well known in the United States of America, where each state has its own roadside geology publication. The roadside concept is based on visiting sites or parts of regions along existing roads accessible by car, bus, motorcycle or bike. Expanding this idea from geology-based into geotourism, according to relevant definitions, we introduce alternative way how to promote and increase public awareness on geotourism and geosites and probably to update the whole geotourism concept into the next level bringing it closer to the general public. In this context, roadside geotourism can be defined as *a special form of geotourism practiced along existing roads using special publications and/or applications*

*(guides) informing on geotourism-related attractions located at or near the road reflecting the nature of geotourism with emphasis on interpretation to the general public (non-geoscientists).*

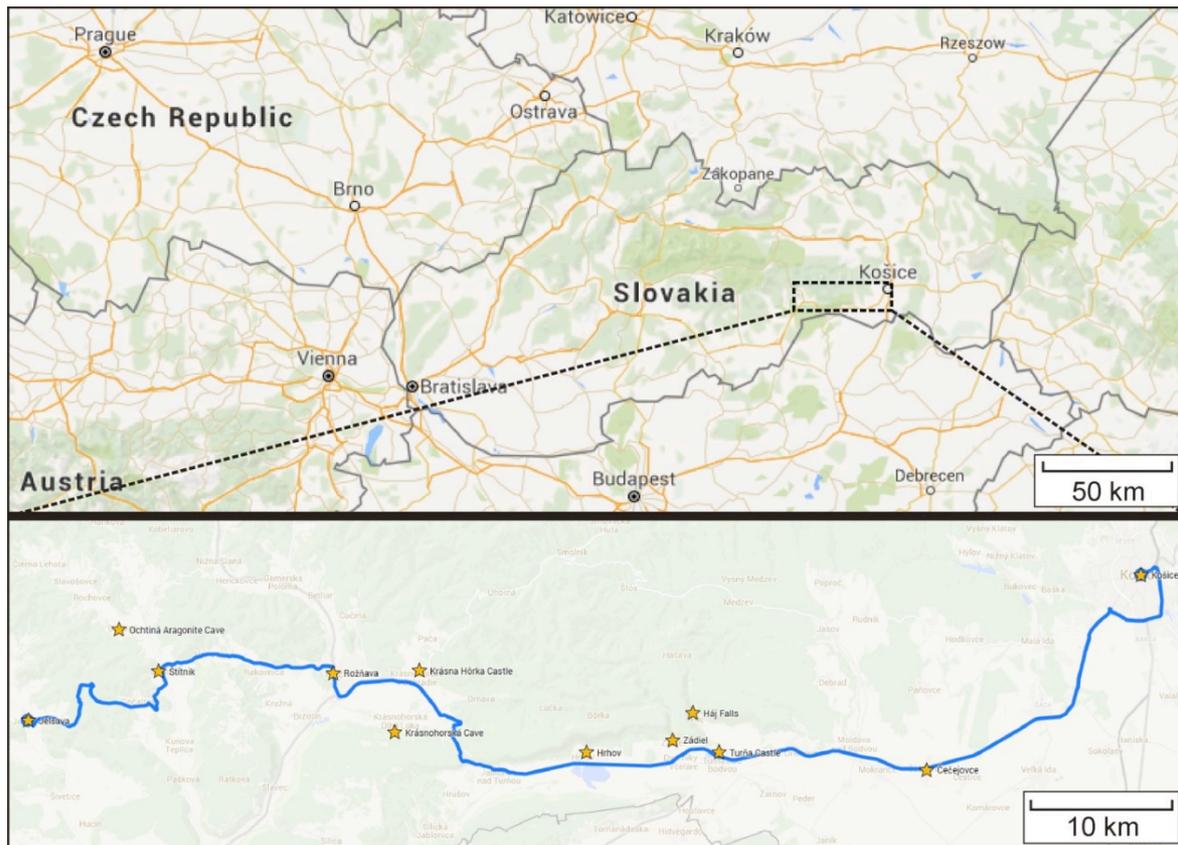


**Fig. 1** Examples of roadside geology book series (source: [www.amazon.com](http://www.amazon.com))

The following text brings an example of an above-mentioned form of geotourism from the area of eastern Slovakia – road from Košice to Jelšava (Fig. 2).

The road is 96,3 km long, and its major part is frequently used by travelers from Košice and other smaller eastern Slovakian cities to the capital city of Slovakia – Bratislava. It passes through attractive countryside with many potential (geo)tourist attractions / stops (Fig. 3, Tab. 1) including various types of sites.

Each of sites included into roadside geotourism guide (book, app, etc.) should include an appropriate description and inform about (geo)tourism related significance as on following the example of the city of Košice.



**Fig. 2** Location of selected road connecting Košice and Jelšava (source: maps.google.com, modified)

Košice, the starting point, of the example roadside geotourism route is the second biggest city of Slovakia. It has preserved medieval city center (the largest monument town reserve in Slovakia). It is a major regional center, extending to the eastern tip of the Slovak Ore Mountains, on the outskirts of Kosice basin. City in its planned development oriented expansion of new residential areas mainly to the north, under the foothills, while the plain on the south was reserved rather to the industry. North-south axis of the Old town, which is the city center and concurrently part of an Urban Conservation Area, is the Main Street. It is so to speak "Cardo" similar to the conception of ancient Roman cities and military camps, intersected perpendicularly by the streets constituting like Roman "Decumanus." The origins of Košice goes back to somewhere around the beginning of the 13th century, to the era of colonization of the region by immigrants from the Rhineland and regularity of the street net is a proof of planned establishment of the city (Halaga, 1992).

**Tab. 1** Roadside geotourism sites along the road from Košice to Jelšava

<b>Location</b>	<b>Type</b>	<b>General features</b>
Košice	cultural - historical/geotourism/ mining tourism	Historical center of eastern Slovakia, mineralogical, rock, historical mining exposures
Čečejevce	cultural - historical	Calvin church with valuable wall paintings
Turňa nad Bodvou - Turňa Castle	geotourism/cultural - historical	Remnants of Medieval Age castle built on carbonate rocks, National Nature Reserve,
Háj falls	geotourism	waterfall
Zádiel	geotourism	gorge with various karst forms, tourist trail with information panels
Hrhov	geotourism	waterfall and karst spring, travertines
Soroška	geotourism	outcrop along the road documenting geological structure of the area
Krásnohorská Cave	geotourism	cave decoration with giant (34 meters long) sinter column – unique within temperate zone caves
Krásna Hôrka Castle	cultural-historical	One of the well preserved castles in Slovakia, its origin is related to historical mining activities in the area of Slovak Ore Mountains
Rožňava	cultural - historical/geotourism/ mining tourism	Historical mining Upper Hungarian city, mining museum, historical mining related traditions
Štítnik	cultural - historical/ mining tourism	Evangelical church with wall paintings and the oldest organ in Slovakia, historical mining, related history
Ochtinská Aragonite Cave	geotourism	cave, rare aragonite filling
Jelšava	cultural - historical/geotourism/ mining tourism	Historical mining and metallurgy related town, active magnesite mine



**Fig. 3** Selected attractions along road from Košice to Jelšava: A – Turňa Castle, B – Háj falls, C – Zádiel gorge, D – giant sinter column of the Krásnohorská Cave, E – Hrhov waterfall, F – Krásna Hôrka Castle

On the crossing of the two main routes is the most famous monument of the City: Gothic five-nave basilica of St. Elizabeth, on a ground plan of a Greek cross, constructed from about 1380 until 1508. Part of its interior is also remarkable Gothic altar from the years

1474 - 1477, which has wings created from 48-panel paintings. Their theme is the life of St. Elizabeth of Thuringia, patron saint of the church, as well as scenes of the Passion and Advent cycle (Spoločníková, 1995). Another factor which makes the urban design of Košice unique in Slovak context is the fact that after the year 1671, when already three bands of walls transformed the city into a fortress, was given to him a new satellite in the form of a six-pointed star bastion citadel that protected the access to the southern Lower gate. Citadel expired in the first quarter of the 18th century, and its remains were recently discovered and made available (Orosová & Žažová, 2011). A similar unique urban reality, unprecedented in Slovakia, is the existence of the local "genuine" boulevard. It was created after the removal of city walls and stretches in a north-south direction, as the street with a park, in the length of one km through the terrain once known as „Glacis" i.e. clear way along former walls (Němec, 1994). The city experienced a turbulent era of industrial growth in the second half of the 20th century. In the 60s of last century, the city was extended to a model district built for 45,000 residents, according generous concept of "New Town" or "Ville Nouvelle" that linked the solution of the issue of social housing with a new Space Habitat for citizens, as residential buildings were set in green park area. Kosice excels in Slovakia also with the number of wards, which has more than twenty. One of them - Kosice-Saca, in the vicinity of the gigantic complex of local ironworks, is completely separated from the town, and by this suburb, our geo road keeps us further east.

On the first sight, it can assume that there is nothing to see in the city of Košice from geotourism point of view. However, the opposite is true. The city lies in the Košická kotlina Valley, formed between the massifs of Volovské vrchy Mts. (on the west), Čierna hora Mts. (on the north-east), and Slanské vrchy Mts. (on the east). Besides "normal" city sightseeing, it is, from geotourism point of view, possible to visit Natural Sciences Department of the East-Slovakian Museum with its geological collection and exposition of Košice Gold Treasure. Also, geological exposition of the Institute of Geosciences at the Technical University of Košice may be a possible point of interest. It includes 1184 mineralogical samples, around 500 petrography related samples, 411 fossils and 595 samples connected to the deposits of mineral resources. Moreover, many of historical buildings are built from rocks allowing to study their features at the historical monuments (e.g. sandstone structures and textures within the blocks of the St. Elizabeth Cathedral). Therefore, one can conclude that there are several significant geotourism related sites or locations in the city of Košice, which deserve the appropriate attention of each geotourist.

## **Conclusion**

Requirements of tourists are still increasing, and there are still new challenges in this field. Geotourism as a global phenomenon (Dowling, 2011) has a solid position within various forms of tourism. Roadside geotourism as introduced in this paper may help to introduce geotourism to the general public more closely as well as to help in the process of overall geotourism development. Moreover, such active “geotourism-based” traveling is much more attractive and valuable via the acquisition of new knowledge about (geo)tourism significant sites and their importance or role in the region.

However, successful and effective roadside geotourism practice requires extensive research aimed on identification, characterization and appropriate description of geosites located along roads as this is essential for roadside geotourism publications or applications as proposed in this paper. Very important thing is that the information should be given in appropriate form and way. Too scientific or professional-like description of geosites may result into loss of interest of non-professionally educated general public what will lead to general decrease of attractiveness and importance of roadside geotourism concept.

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