

HIGH-SPEED RAIL AND TOURISM: A REVIEW OF RESEARCH AGENDA

Vysokorychlostní železnice a cestovní ruch: přehled výzkumné agendy

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Annotation

Transport infrastructure is an essential component of competitive tourism development and a key element in moving the tourists efficiently nearer to the tourism product. The location, capacity, efficiency, and connectivity of transport can significantly influence the mobility of tourists and enhance the destination's accessibility. Researchers' interest is to investigate how high-speed rail (HSR) can determine the destination choice, reinforce its attractiveness, and affect the tourists' consumption patterns. This paper aims to define basic directions of research in the field of tourist mobility and high-speed rail. Based on the current publishing activity, it identifies the research problems and the approaches applied by the researchers. The literature review process involves searching the relevant literature, extracting data, analysing data, and synthesising the findings using descriptive synthesis. The results mostly come from areas where the HSR already exists. The HSR can affect the tourists' choice to visit neighbouring cities. Similarly, it gives value to already known and popular tourist destinations. Finally, it should be noted that the evidence is, however, often extremely limited.

Key words

tourism development, mobility, decision-making

Anotace

Dopravní infrastruktura je nezbytnou součástí konkurenceschopného rozvoje cestovního ruchu a klíčovým prvkem pro efektivní přiblížení turistů k produktu cestovního ruchu. Lokace, kapacita, efektivita a propojení dopravy může významně ovlivnit mobilitu turistů a zlepšit dostupnost destinace. Zájem vědců se proto stává snaha prozkoumat, jak existence vysokorychlostní železnice může ovlivnit výběr destinace, posílit její atraktivitu a ovlivnit spotřební vzorce turistů. Tento příspěvek si klade za cíl definovat základní směry výzkumu v oblasti turistické mobility a vysokorychlostní železnice. Na základě současné publikační činnosti identifikuje výzkumné problémy a přístupy výzkumníků. Rešeršní proces zahrnuje vyhledávání relevantní literatury, extrakci dat a následnou analýzu a syntézu výsledných zjištění. Výsledky většinou pocházejí z oblastí, kde vysokorychlostní železnice již existuje. Vysokorychlostní železnice může ovlivnit rozhodnutí turistů navštívit sousední města. Stejně tak ztraktivňuje již známé a oblíbené turistické cíle. Závěrem je nutné podotknout, že důkazy jsou často velmi limitované.

Klíčová slova

rozvoj cestovního ruchu, mobilita, rozhodovací proces

JEL classification: R41, Z32

1. Introduction

Transport infrastructure is an essential component of successful tourism development (Prideaux, 2005). Transport is a key element in moving the tourists efficiently nearer to the tourism product (Page, 2005). The location, capacity, efficiency, and connectivity of transport can significantly influence the mobility of tourists and enhance the destination's accessibility. From this point of view, travel mobility is one of the megatrends with significant impact and relevance for tourism, expected to drive change and transform the tourism sector (OECD, 2018). Moreover, rapid urbanization can expand the 'modes' of mobility, by changing the length and frequency of travels

and commuting. Therefore, scientific literature has drawn attention to the transformational transport systems and their impact on people and destinations from the physical or social dimension (Bakker et al., 2014).

The social dimension brings the opportunity of a new perspective on transport in the context of tourists' consumption patterns. Several researchers focus on the tourists' decision-making process from the perspective of mobility (Curtale, 2019). They attempt to understand tourists' behaviour in terms of transportation use (Gross & Grimm, 2018) and their attitude towards the new alternative means of transport (high-speed rail) to reach their destination of interests. In other words, the research examines what factors determinate the travellers' transport decisions (Dallen, 2007; Duval, 2013). The value of travel-time savings and money savings (Hergesell, Dickinger, 2013; Wardman, 2001) are considered as well.

The changes in consumption and tourists' behaviour can lead to shifts in the tourism market and put pressure on destination competitiveness and sustainability (OECD, 2018). High-speed rail (HSR), perceived as a convenient and more environmentally friendly alternative (Rietveld, 2000), can also bring new socio-economic challenges to a destination (Thakran, Verma, 2013). From this perspective, it is interesting to investigate how high-speed rail can determine the destination choice and reinforce its attractiveness in the tourists' minds.

The aim of the paper is to define basic directions of research in the field of tourist mobility and high-speed rail. We want to analyse the current publishing activity and focus on identifying the research problems they address and the approaches they apply.

2. Methodology

Evaluation of publishing activities is based on data generated by the Web of Science databases. With the help of keywords (high-speed rail, tourism) we have identified more than 2 thousand articles dealing with the topic of high-speed rail. Subsequently, we restricted this selection by applying another keyword: "tourism". The resulting database contained 70 articles, which we analysed in depth.

It filtered out about two-thirds of the articles. These were articles that addressed the topic very marginally or on the contrary showed duplicate information or approaches. In the end, we devoted 21 publications in great detail. See table 1 for an overview.

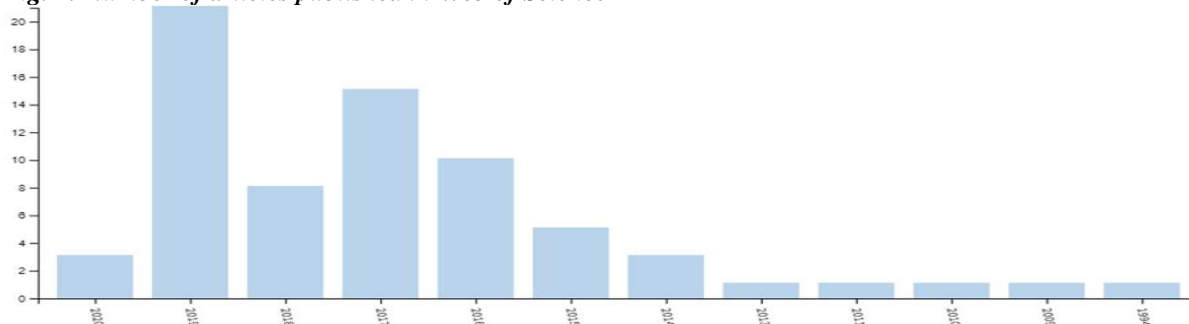
The first step was to analyse basic publication information on all identified articles (with HSR and tourism keywords). Here we followed:

- the development of publishing activities over the times,
- authors who publish in the topic,
- institutions, where these outputs are produced and
- the fields of study within the publications appear.

3. Results

In the field of research, the topic of the potential of high-speed rail for tourism development is relatively new, even though high-speed rail has been with us for over 50 years. According to data from the Web of Science (Fig. 1), increased attention has been paid to this topic in the last 5 years. We can also note the gradual growth of interest in this topic. The largest number of articles has been published in the last completed year (2019).

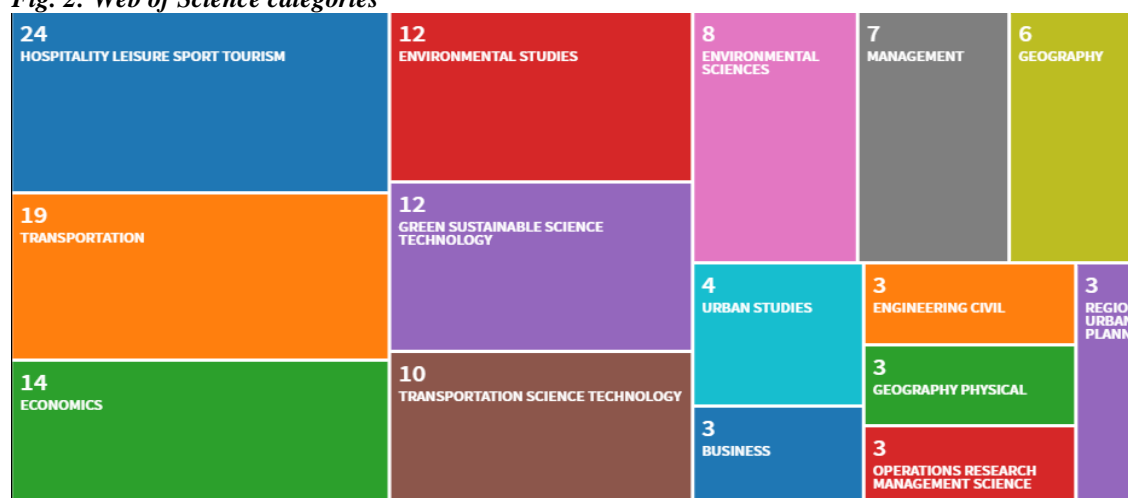
Fig. 1: Number of articles published in Web of Science



Source: authors' processing based on Web of Science, Analytic Report

The HSR and tourism issues are basically solved in interconnected fields of studies. Besides tourism and it is of course transport studies, and within the economic and geographical sciences. The importance of environmental studies is increasing, and all of this is covered by typically cross-cutting science disciplines such as regional studies and regional planning (see figure 2).

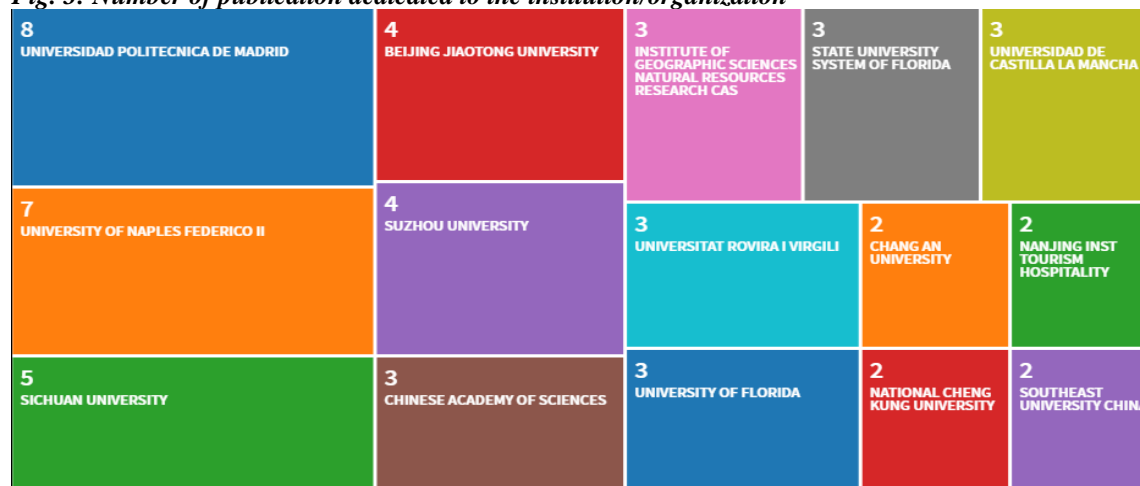
Fig. 2: Web of Science categories



Source: authors' processing based on Web of Science, Analytic Report

In the 70 analysed articles (see Fig. 3), the most numerous are represented by Francesco Pagliari of the University of Naples Federico II, Luis Campa of the Universidad Politecnica de Madrid and his colleague Begona Guirao of the same university. The Catalan school is represented by Aaron Gutierrez from Universitat Rovira i Virgili. Important Chinese research centers include Sichuan University (Zhenzhi Yang, Taohong Li), Suzhou University (De Wang Wang, Jia Qian, Su Feng) and Beijing Jiaotong University (Ping Yin).

Fig. 3: Number of publication dedicated to the institution/organization



Source: authors' processing based on Web of Science, Analytic Report

3.1 Research problems

An initial review of the literature has indicated that the high-speed rail may lead to a reduction in transport costs and support tourism development in a destination attracting the growing number of tourists. At the same time, it enhances spatial competition between tourist destinations. Furthermore, it can have an effect on a decrease in the average number of overnight stays and on an increase in short-term tourism (extended weekend stays). All these changes force DMOs to think differently and to adopt new approaches of dealing with new tourists' consumption patterns.

Two main themes emerged from the analysis:

1. Tourists' behaviour and its changes, incl.:
 - Tourists' decision-making process (e.g., transport choice, destination choice)

- Tourists' consumption patterns (e.g., average number of stays, tourists' preferences)
2. Destination competitiveness and tourism development, incl.:
- Enhancing destination's accessibility (e.g., functional-spatial arrangement, attractiveness)
 - Enhancing spatial competition (e.g., dealing with new tourists' consumption patterns)

The studies deal with the role of high-speed rail in tourism development, its influence on tourist behaviour, mobility, and consequences for destination sustainability/competitiveness. The results mostly come from areas that have experience with HSR (where the HSR already exists). However, the effects caused by HSR are often controversial, extremely weak or just depend on specific destination characteristics or dimensions.

As the accessibility from the destination point of view regards, there are no clear direct effects on the destinations (e.g., Albalate, Fageda, 2016; Guirao, Campa, 2016). HSR probably does not play a role in the destination choice but can have a significant influence on the choice of visiting nearby cities (Pagliara, La Pietra, Gomez, Vassallo, 2015). According to Albalate, Campos, Jiménez (2017), minimal or even negative effects are restricted to large cities. However, improvements in accessibility are expected to promote the revitalization of urban and business tourism due to a reduction of the generalized cost of transportation (Albalate, Campos, Jiménez, 2017). Moreover, spatial competition may reinforce the agglomeration of the tourists in more developed areas (Masson & Petiot, 2009). On the other hand, HSR can lead to reduction in the days spent in the destination (e.g., Gutiérrez, Miravet, Saladié, Clavé, 2019).

From the behavioural point of view, the travellers' general holiday preferences are very influential in vacation destination and mode choice. Low-income travellers or families with limited consumption potential may prefer the surface ground (public) transport mode, while high-income travellers are more likely to use the air mode (LaMondia, Snell, Bhat, 2010). According to LaMondia, Snell, Bhat (2010), some distant vacation destinations may be feasible for most individuals only by the air mode. Air transportation is the main mode for long-distance and a strong predictor of tourist arrivals. Albalate, Fageda (2016) point out that HSR services affected air traffic in Spain negatively. HSR had a detrimental impact on air traffic in the provinces of Spain. From their point of view, HSR is more competitive than air travel and has a negative indirect effect on tourism. Their findings illustrate that augmenting the supply of transportation with additional modes may not have positive effects on economic activities when the mode that loses out is air transportation. On the other hand, a completely different result is related to the cooperation effect between HSR and air transport, which encourages the arrivals of foreign tourists (Campa, Pagliara, López-Lambas, Arce, Guirao, 2019).

Tab. 1: Overview of studies, which deal with the HSR in the tourism context

Authors	Survey area	Content and results
Masson, Petiot (2009)	South European HSR lines between Perpignan and Barcelona	HSR and tourism destination development and attractiveness reinforcement: These effects may appear only if a previous tourism potential exists. The HSR could reinforce the agglomeration of the tourism industry on the most developed area. An analysis shows that the resulting increased spatial competition may reinforce the phenomenon of the tourism activities agglomeration around Barcelona to the detriment of Perpignan.
LaMondia, Snell, Bhat (2010)	European Union case study (vacation destination and travel mode choice)	The results indicate the important effects of nationality, traveller demographics, companionship arrangement, traveller preferences and values, and destination characteristics on holiday destination and travel mode choice.
Cascetta, Papola, Pagliara, Marzano (2011)	HSR between Rome and Naples	Revealed preference survey concerning also the socioeconomic characteristics of the users: HSR probably has impacts on mobility choices. Cities linked by HSR are transformed into a functional region and previous car users leave car in favour of HSR.
Pagliara, Vassallo, Román (2012)	HSR vs air transportation in Spain	Preference survey for a modal choice: Prices and service frequency were found to be among the most important variables. Check-in and security controls at the airport are a crucial variable for users in making their modal choices. Improvement of parking facilities play a secondary role.
Wang, Huang, Zou, Yan (2012)	HSR network in China (regional tourism)	Time-space replacement concept to extend the gravitational model created by the implementation of China's HSR: the effects of HSR on China's tourism include a redistribution and transformation of tourist markets; market competition on a larger scale; and a reallocation of urban tourism centres.
Hergesell, Dickinger (2013)	(mostly) Austrian students' decision-making	Transport mode choice as a critical element in decision-making, affecting also the environmental impacts: Results indicate that cost is the most important attribute for transport mode choice followed by time, with convenience playing a secondary role for student travellers.
Delaplace, Pagliara, Perrin, Mermet (2014)	Paris, Rome (HSR role in decision making)	The role of the HSR system in holidaymaker's decision: the quality of the destination promotion and attractiveness influence the choice of a tourist. In Paris, HSR was the third main motivation after cultural offers and historical landmarks. The HSR system affected the choice of Rome differently.
Chen, Haynes (2014)	HSR network in China (international tourism)	The impact of the HSR systems on its international tourism demand: the examination confirms the overall positive impact of HSR, but the small elasticity of HSR station on international tourism demand may imply the negligible influence of the large number of small HSR stations that were developed due to political purposes.
Chen, Lin (2015)	Shanghai integrated transportation hub	An empirical case on transportation and urban functional value: emergence of this integrated hub would further decentralise urban development, relieve traffic congestion, improve air quality, and yield other sustainable development benefits.
Marti-Henneberg (2015)	HSR network in the world	A comparative view of the HSR stations in service: Europe is the area with the most striking contrasts between stations and some of them have an urgent need to attract more passengers according to their capacity to attract travellers.
Pagliara, La Pietra, Gomez, Vassallo (2015)	HSR network in Spain (urban destinations)	HSR effects on tourism demand and urban tourism destination choice: Spanish HSR system seems to have a significant effect on the tourists' choice to visit other cities close to Madrid, but the choice of Madrid as a tourist destination is not influenced by the presence of HSR, but the quality of promotion of historic and artistic heritage resources plays a major role.
Albalade, Bel, Fageda (2015)	HSR and air transportation in Europe	Impact of HSR on air service frequencies and seats offered by airlines in large European countries: the results generally find direct competition between HSR and airlines, but they also provide some evidence that HSR can provide feeding services to long haul air services in hub airports, particularly in hub airports with HSR stations.
Guirao, Campa (2016)	HSR network in Spain	The cross effects between tourism and HSR: effects of tourism on HSR demand and effects of HSR on tourism demand. Results show clearly the positive effects of tourism destinations on HSR demand; however, effects on tourism demand caused by HSR are controversial and not clear empirical evidence can be derived.
Albalade, Fageda (2016)	HSR network in Spain (effect on air traffic)	How changes in the provision of HSR services affect tourism outcomes: air traffic, as a strong predictor of tourist arrivals, is negatively affected by HSR; it suggests a negative indirect effect of HSR on tourist outcomes. On the other hand, HSR may have a positive (weak) direct effect on tourism. The net effect of HSR on tourism outcomes is not consistently positive.
Wang, Wang, Chen, Lu, Niu, Alan (2016)	HSR network in China (regional tourism)	Mechanisms through which HSR affects regional tourist flows: HSR's effects on the spatial structure of regional tourist flows are manifested through the Matthew effect. HSR will strengthen the aggregation effects of tourist flow in the diffusion sources, which will thereafter diffuse to peripheral tourist areas. The overlying effect is only generated in those tourism nodes with a favourable location condition, an endowment of tourism resources, hospitality capacity, tourist transportation network density, and obvious "time-space compression".
Aversa, Petrescu, Apicella, Petrescu (2017)	Pompeii (Southern Italy)	Adoption of an environmentally sustainable mobility strategy to future municipality urban plan: a combination of energy and mobility strategies to achieve environmental and economic benefits.

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Authors	Survey area	Content and results
Gutiérrez, Ortuño (2017)	HSR network in Spain (coastal destinations)	HSR and tourists' behaviour: Results highlighted that no specific tourist profile is associated with HSR. Among its implications, to analyse travellers that HSR can attract, it is vital to consider the specific characteristics of each destination and its current market.
Albalate, Campos, Jiménez (2017)	HSR network in Spain (effects on the local level)	The empirical measurements of real spillover effects (impact of HSR on the number of visitors and their length of stay on the local level): these effects are, in general, extremely weak or just restricted to larger cities with pre-existing tourism amenities or attraction factors.
Wang, Niu, Sun, Wang, Qian, Li (2017)	HSR network in China	Power to attract tourism of cities linked by China's HSR: HSR enhances the tourism field strength value of regional central cities, and the radiation range of tourism attraction extends along the HSR line.
Wang, Niu, Qian (2018)	HSR network in China (urban destinations)	Optimization of urban tourism spatial structure before and after HSR network: The results show that HSR strengthens tourism-based economic relationships between cities. The hinterland of central cities are enlarged, of which spatial linkages between the hinterlands are increased. The competition and difference for the hinterland of central cities are intensified.
Sun, Lin (2018)	HSR network in Taiwan	The influence of HSR on tourism and travel patterns in relation to time, space and carbon emissions: HSR facilitates a journey's flexibility through the modification of travel distance, intercity travel time, and then by adjusting annual travel frequency and total travel days. The provision of HSR has both positive and negative implications on tourism consumption and environmental pollution.
Gross, Grimm (2018)	mode of transport at German destinations	The determinants that influence sustainable mode of transport choices: The most important determinants for sustainable mobility (public transport use) are: age, household size, net household income, car availability and current professional activity. In terms of travel-orientated variables, the arrival transport means, as well as the travel duration, travel expenses, and travel organisation stand out.
Gutiérrez, Miravet, Saladié, Clavé (2019)	HSR network in Spain (coastal destinations)	The influence of the availability of HSR on tourists' destination choice and determinants of the length of stay: Results revealed that the existence of HSR services played a minor role in tourists' decision of whether to visit the destination. It can affect the length of stay – it allows a higher degree of flexibility. HSR tends to reduce the number of nights spent by tourists at the destination.
Yin, Pagliara, Wilson (2019)	HSR network in China (urban destinations)	The impact of HSR on the tourism spatial distribution and interaction: the HSR network in the future scenario could significantly increase the total tourism spatial interaction and could reduce the spatial difference. Larger cities should take an HSR network as a development opportunity to enhance their attractiveness.
Campa, Pagliara, López-Lambas, Arce, Guirao (2019)	HSR network in Spain (cultural tourism)	Role played by HSR in fostering cultural tourism: The results show different impacts based on the regions, the characteristics of the museums, and the expected tourists. A positive effect is more evident for destinations with previous cultural attractions. The HSR station as an enabling factor for the surrounding municipalities.

Source: author's processing

4. Conclusion

This paper presented the evidence on the effects of high-speed rail on a destination choice and the tourists' consumption patterns. Based on the current publishing activity, it outlined basic directions of research in the field of tourist mobility and high-speed rail, identified the research problems and the approaches applied by the researchers. The findings regarding HSR networks and their impact on tourism development are not entirely clear. Effects of HSR on tourism demand are controversial. Actually, the reduction in the number of nights spent at the destination has been observed.

Positive effects are more evident for destinations with existing previous potential, heritage resources, and cultural attractions. Quality of the destination promotion can enhance positive HSR effects. The results indicate that the HSR station is an enabling factor for the surrounding municipalities. It has positive effects mainly on urban destinations. From this point of view, HSR can strengthen relationships between cities and represent the development opportunity for larger cities. However, results show clearly the positive effects of tourism destinations on HSR demand as destination characteristics (among other things) influence travel mode choice.

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This article was supported by the Ministry of Education, Youth and Sports of Czech Republic in the Operational Programme Research, Development and Education [grant "New mobility - high-speed transport systems and transport behaviour of the population" with project no. CZ.02.1.01/0.0/0.0/16_026/0008430].