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Transport Accessibility and Sustainable Tourism: An Integrative Review of Global, Urban and Indigenous-Remote Contexts

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Annotatsiya

Transport and tourism are an interwoven system that are rarely researched together and often are not sustainable. Four recent studies have been combined to understand the relationship between transport accessibility and tourism development. The first study looked at the global tourism and transport system whilst the second and third studies looked at transport accessibility within a large metropolis (Bangkok) and remote indigenous regions (Siberia). A qualitative document based integrative review has been conducted analysing the conceptual framework, methods and results of each study. Transport systems were found to be a driver and outcome of tourism development. The main transport used within the tourism and transport industry are cars and air transport. This causes approximately 8% of greenhouse gases globally from 2009-2013. In Bangkok there is more of a relationship between attraction density and transport diversity (centrality), rather than walkability. 91.1% of grid cells within the study had no combination of transport available. Within Siberia there is mixed views from the local community about the roads. Whilst they are seen as a lifeline there is also fear of mass tourism. To create sustainable relationships between tourism and transport it is necessary to move away from a tourist orientated and technology orientated approach. Focus should be placed on creating integrated, multi-modal transport systems, mobility justice and community agreement. Limitations and future research areas have been identified. Each source has been coded into 5 categories; scale/context, conceptual framework, methods/data, key findings and sustainability implications.

Kalit so‘zlar: sustainable tourism, transport accessibility, mobilities, public transport, indigenous communities, mobility justice.

1. Introduction

Transport is a key component of tourism as it will influence a persons ability to travel to locations of interest (Dinu, 2018). Tourism has increased due to improvements in transport infrastructure causing investments in transport. However there can be a lack of communication between travel and tourism experts (Hopkins, 2019). Often research on sustainable tourism is focussed on static factors however transport can play a key role in creating unsustainable tourism. Approximately 8% of total global

greenhouse gas emissions were caused by tourism between 2009-2013 (Lenzen et al., 2018 cited in Hopkins, 2019). From a destination perspective it can create issues such as congestion, accidents and pollution due to high levels of reliance on personal vehicles. In Bangkok in 2021 there was over 3.9 billion vehicle km travelled on highways compared to approximately 232.4 million on buses (Iamtrakul et al., 2025). In remote areas there can be a lack of transport options which affects tourism and local development. New roads can pose issues as they threaten traditional ways of life and can affect culture (Kuklina et al., 2022). Often these areas are seen as separate issues. This article has looked at four different studies to gain a holistic view of transport and tourism. A conceptual based study introducing sustainable tourism and transport (Hopkins, 2019), an economic overview of the impact of transport with international tourism (Dinu, 2018), a spatial analysis of public transport and tourist attractions in a megacity (Iamtrakul et al., 2025) and a social anthropological study of transport and tourism in indigenous territories in Siberia (Kuklina et al., 2022). This review has been carried out as there are three main reasons why these studies are useful. Firstly they look at transport and tourism from multiple perspectives and scales. They include a conceptual based study to set an agenda (Hopkins, 2019), an economic descriptive based study (Dinu, 2018), a quantitative spatial based study (Iamtrakul et al., 2025) and a qualitative field based study (Kuklina et al., 2022). Each study looks at one aspect of the issue. Secondly most literature focuses on transport from a source to destination perspective with most relating to aeromobilities. There is less focus on transport within the destination and remote areas (Hopkins, 2019). Thirdly conceptual studies have showed the importance of emissions and justice but there is little evidence from a spatial perspective. Spatial studies identify issues with transport accessibility but do not focus on how the local community feel. Community studies look at local attitudes but do not consider how transport works. There is therefore no study that looks at transport accessibility and how it can relate to sustainability and acceptance by the local community from a variety of scales. This article compares how transport accessibility has been conceptualised in four recent studies and draws conclusions on how it can be used to inform sustainable transport and tourism planning strategies. The specific objectives of this article are: (i) Compare how transport and tourism have been conceptualised in each study. (ii) Summarise what evidence has been provided related to transport accessibility, transport choice and sustainability of transport from a global, urban and remote indigenous scale. (iii) Identify similarities, conflicts and gaps in the studies. (iv) Identify implications for planning and future research. From the literature in section 2 three analytical expectations can be made. Firstly transport can be both a cause and effect of tourism. Secondly transport accessibility is complex and cannot be measured solely based on distance/time. Lastly transport infrastructure can have different perceptions.

This article will answer the following research questions:

1. How has transport and tourism been conceptualised?

2. What empirical evidence has been provided on transport accessibility, transport choices and sustainability?

3. What are the implications for sustainable transport and tourism planning?

This article makes three contributions. By combining conceptual, economic, spatial and community evidence it shows transport accessibility can be complex and

contested depending on the diversity of transport modes, reliability and local acceptance. It also connects sustainable mobility with the mobility justice agenda. This article follows the IMRaD format. Section 2 looks at relevant literature providing the conceptual framework. Section 3 outlines the methodology. Section 4 provides results. Section 5 discusses the findings, implications and limitations of the review. Section 6 provides the conclusion..

2. Literature Review

Transport is seen as both a cause and effect of increased tourism (Dinu, 2018). Transport is a key factor when accessing locations for tourists meaning that tourism overall will improve. Infrastructure will also increase due to tourism. Overall transport is important in tourism mostly due to access. However, transport and its forms are vital to the international tourism system (Page, 2005; Culpan, 1987). When deciding which transport to use tourists will take into consideration distance, time, ease of access, safety and reliability and comfort. There are four main types of transport used. For mass tourism trains are used whereas planes are used for longer distances. The relationship between transport and tourism is referred to as tourism-transport (Hopkins, 2019). Transport is a very broad term as it includes movement, infrastructure, experiences, behaviours and policies. Transport can be divided into three categories: ‘A’ to ‘B’ transport, Tourism-transport (Cruises, coach tours, long distance rail) and transport at destination. Most studies have focused on ‘A’ to ‘B’ transport with aeromobilities being considered. There are two positive feedback loops in the tourism industry that result in tourism having a high carbon footprint. These are automobility (Urry, 2004) and aeromobilities (Hopkins, 2019). Banister’s (2008) sustainable mobility paradigm suggests that there are four things you can do to reduce travel needs, encourage modal shift behaviours, reduce distances travelled through land use policies and improve efficiency through technology. This paradigm emphasises that just improving efficiency through technology is not enough. There is a lack of sustainable tourism-transport paradigm that could be applied to urban, rural and international tourism (Hopkins, 2019). The review shows that market and behaviour based transport solutions have issues. Voluntary carbon offsetting will only affect 2-10% of travellers. Carbon tax would have minimal and variable affects for destinations (Hopkins, 2019). Techological solutions such as automation, electrification and sharing can have positive impacts however they can be limited by rebound effects and the social aspect of technology. Iamtrakul et al. (2025) stated that their research was part of the literature that highlights the importance of public transport networks for access and sustainability. Previous research has mainly looked into tourist attitudes and perceptions using qualitative methods. Minimal research has been done using spatial analysis. Where accessibility has been looked into it has been mainly focused around distance based measures and coverage of service areas. This study focuses on how transport networks can be analysed using centrality (measures how many and variety of transport nodes there are), density and accessibility. This is because the number and variety of transport modes can affect accessibility. Mobility justice should be considered (Hopkins, 2019). Host communities may experience negative impacts from tourism-transport including noise and air pollution but will have no benefits. There is inequality in mobility and immobility. More consideration should be given to immobilities, extra-tourism-transport (mobility of goods and services that support

tourism) and labour in the tourism-transport sector. Kuklina et al. (2022) look into how transport accessibility is viewed in remote indigenous territories. They show that nomadic and sedentary cultures will view transport accessibility differently. Informal roads and tracks are still important for indigenous communities. Local communities may see seclusion as a benefit providing them with autonomy and preserving their culture. Tourism is often heavily marketed as a solution to depressed areas however this can cause conflict. Spontaneous tourism and road development will occur without local consultation. This can result in degradation of traditional cultural landscapes. The four studies are rarely looked at together. Conceptual studies have highlighted emissions and justice but do not provide much evidence. Economic overview studies have highlighted growth and accessibility however do not take into account externalities. Spatial studies have looked into accessibility however not community views. Community studies have looked into local attitudes however not the network. This article focuses on how these studies can be compared. The literature suggests there are three ways to consider these studies. Firstly accessibility. Transport is the main function of tourism (Dinu, 2018). Accessibility can be measured by looking at how many and variety of transport modes there are and how close they are (Iamtrakul et al., 2025). Secondly sustainable mobility. This looks into reducing travel needs, modes, distances travelled and improving efficiency. However it highlights that just improving efficiency through technology is not enough (Banister, 2008; Hopkins, 2019). Thirdly mobility justice and community consent. This looks into who will experience negative impacts, who will benefit and who will make the decisions (Hopkins, 2019; Kuklina et al., 2022). The main constraint in sustainable mobility is automobility (Urry, 2004) and aeromobilities. Each of the studies complement each other. Hopkins (2019) has a normative and conceptual focus, Dinu (2018) has an economic and mode focus, Iamtrakul et al. (2025) have urban spatial evidence and Kuklina et al. (2022) have a community focus. Considering all four studies helps them to complement each other. A study will have aspects that are not as much considered however the strengths can be used to overcome the weaknesses (Section 3).

3. Methodology

A qualitative document based integrative review has been completed. This involves taking arguments, methodology and results from 4 peer reviewed/scholarly sources specifically related to transport and tourism. The sources have been provided. They have been chosen to cover a range of perspectives relating to transport and tourism; global conceptual, economic/modal, urban spatial and local Indigenous and remote. This was a purposeful sample. The sources have been thoroughly analysed. They have been coded into 5 themes; 1) Scale and Context, 2) Conceptualisation of Relationship between Transport and Tourism, 3) Methodology/Data, 4) Key Findings and 5) Implications for Sustainability. Thematic synthesis has then been undertaken to compare the findings. This has shown any overlaps, areas of agreement, disagreement or complementarity. All quantitative data has been presented as it was found. Hopkins (2019) provides an overview to this special issue. This uses transport geography, mobilities and sociotechnical transitions concepts. Dinu (2018) provides an overview of the role of transport and economy using secondary data. Data include statistics on international arrivals by transport mode (2017) (Statista) and infographics from UNWTO. Iamtrakul et al (2025) provides quantitative analysis using GIS. Kernel

density, centrality and network service areas were analysed using a 500x500m grid. Statistical analysis was conducted through a one way ANOVA. Public transport nodes (Rail, Bus, Water) were analysed alongside 328 attractions. Kuklina et al (2022) provide qualitative data from fieldwork. In-depth interviews, group interviews, non-participatory observations and expert interviews were undertaken. Approximately 100 responses were collected from 12 communities across 5 regions in Siberia. Age ranges were 18-58 and the interview duration ranged from 25-90 minutes. Snowballing was undertaken. The quality of the sources will impact the synthesis. Methodologies vary between sources, the years vary (2018-2025) meaning they were purposefully selected. Formal quality checks were not undertaken. Due to this the findings cannot be statistically combined. Conclusions should be seen as proposals.

Table 1: Overview of sources

Study Scale/Context Approach/Data Focus

Hopkins (2019) Global Interface Conceptual (Transport Geography, Mobilities, Sociotechnical Transitions) Sustainable Mobility, Emissions & Mobility Justice

Dinu (2018) International (National & Modal) Descriptive (Secondary Data) Role of Different Transport Modes in Tourism Development & Accessibility (Statista & UNWTO Infographics 2017)

Iamtrakul et al. (2025) Urban (Bangkok) Quantitative (GIS Analysis – Kernel Density, Centrality & Network Service Areas) 500x500m Grid. One Way ANOVA. 328 Attractions Centrality & Accessibility of Public Transport (Rail, Bus, Water)

Kuklina et al. (2022) Local Indigenous Communities Qualitative (Fieldwork) Interviews, Non-participatory Observations. Approximately 100 Responses across 12 Communities (Snowballing). Attitude to Roads & Tourism Development.

An integrative review has been undertaken due to the differences in disciplines, methodologies and scales between the sources. This meant the findings couldn't be combined statistically and would be best compared analytically. The sources were purposefully selected to ensure they all related to transport and tourism with a range of analysis (global conceptual, economic/modal, urban spatial, local Indigenous) (See Table 1). No formal inclusion/exclusion criteria, database searches or quality checks were undertaken. Each source has been thoroughly analysed and coded into 5 themes to extract information. Themes include; 1) Scale/Context, 2) Conceptualisation of Relationship between Transport and Tourism, 3) Methodology/Data, 4) Key Findings and 5) Implications for Sustainability. Findings have been presented as they were stated by the authors and any limitations mentioned. Thematic synthesis has been undertaken to compare the coded data. This has identified areas of agreement, disagreement and complementarity. Section 4 findings have been grouped into themes. These include; bidirectional relationship between transport and tourism, transport mode choice, car reliance, evidence of urban spatial, externalities, local attitude to transport and comparisons between scales. Quantitative data has been presented as found. Data couldn't be compared due to some sources having different bases (international arrivals vs total journeys). No primary data was collected and no human participants meaning

ethical approval wasn't required. All analysis has been from published work. All sources have been fully cited.

4. Results

All four studies found a bidirectional relationship between tourism and transport. Dinu (2018) refers to this as the 'cause and effect' of tourism. This is shown in the Altai Republic by Kuklina et al. (2022), they found that roads affect tourism and tourism affects roads. Bridges, another road alongside the Katun River and the infrastructure in the 'Turquoise Katun' special economic zone were all built due to tourism. Iamtrakul et al. (2025) found that there was a high concentration of attractions in areas of public transport. Hopkins (2019) found that tourism can also help justify and fund public transport. For example in Koblenz there is an urban ropeway, which has become a tourist attraction. In 2017 the percentage of international inward tourism that used air transport was 57%, road was 37% and water and rail were 4% and 2% respectively. Car transport is the most common transport used in world tourism (77% of all journeys) (Dinu, 2018). It is important to note that the percentages were calculated in different ways so cannot be compared. However, cars are popular due to being flexible, affordable and independent whilst air transport are popular for being fast and safe for long distances. Hopkins (2019) highlights the negative impacts on sustainability due to this. Tourism accounts for around 8% of emissions. However, automobility and aeromobilities create positive feedback loops. In Bangkok there is a strong reliance on private transport (Iamtrakul et al., 2025). Most tourists favour vehicle transport due to it being convenient and flexible. In rural areas there is still a strong reliance on private transport (Hopkins, 2019). In the Altai Republic there is no rail, regular flights within the country or significant water transport so in reality all transport is done using cars (Kuklina et al., 2022). Iamtrakul et al. (2025) found that there was a high concentration of attractions in the city centre. There was a high concentration of historical sites (55.49%) of the 328 attractions. Art and science education made up 17.68% and recreation made up 12.80%. There was a low concentration of public transport in 91.1% of grid cells. Only 8.5% had both bus and rail and 0.3% had bus, rail and water. The higher the concentration the better the accessibility. The mean area covered was much larger in high concentration areas (122m) than low concentration areas (1.886km) (one way ANOVA, $F = 75.8$, $p < 0.001$). However, the majority of attractions are within 500-1000m of public transport. Only 1.1% are further than 2000m. When looking at each type of transport over half are outside the 2000m radius. Areas with higher numbers of attractions had higher concentrations of public transport ($p = 0.011$). However, there is only a significant difference in the level of accessibility at the 10% level ($p = 0.085$). Overall the concentration is more important than distance. Having a variety of transport options and availability is most important. Issues with reliability were also found. Buses are not always on time, rail times are not always reliable and there are uncertainties with safety. Hopkins (2019) found that there are a range of externalities imposed upon local communities. For example it is estimated that cruise ship emissions at Greek ports may result in health costs of between €12.4-24.3million (€2.5-5.3 per passenger). However, this may be less relatable as it is monetary. There are issues with extra-tourism-transport, which includes freight, waste and labour. There are also issues with seasonal congestion and pricing to account for externalities. Transport services are also capital

intensive so require huge investments (Dinu, 2018). Governments must aid developments, ensure costs are competitive and staff are trained. Kuklina et al. (2022) found that there were 5 attitudes to transport found through interviews:

The road of life – The main routes such as the Chuisky tract are seen as vital to bring in money, access healthcare, services and tourism.

Escape route – Roads can increase emigration of young people however in Iengra where Evenk people do not have anywhere to go traditionally the population remains.

Bear's corner, but mine – Many locals are happy to have tourists that they know or are referred by local tour operators. However they do not like new roads that allow outsiders to enter their territory and cause mass tourism. For example they do not want the Uimonsky and Chuisky tracts to be linked together and a road to China to go across the sacred Ukok plateau.

Off-road is my bread – Some people make money by transporting tourists using horses and high clearance vehicles so are not interested in improved roads.

Waiting for a miracle – Those who already cater for tourists hope for better roads. For example in Ust-Urkima a 5 day tour is not profitable as 2 days are spent travelling and the last 29km are a washed out dirt road.

Locals identified that mass tourism causes litter, poaching and culture change. However backpacking/hiking is generally accepted. There is very little infrastructure for tourism. Todzhinsky kozhuun has 6 accommodation options. The number of registered tourists increased from 3693 in 2018 to over 6000 in 2019. Globally the main issue is decarbonisation and justice (Hopkins, 2019). Nationally and by transport type the focus is on accessibility, affordability and growth (Dinu, 2018). Urban areas face issues with having a variety of transport types to reduce car dependency (Iamtrakul et al., 2025). Locally and remotely there are issues with gaining consent, keeping culture intact and ensuring benefits are spread (Kuklina et al., 2022).

5. Discussion

Overall four key points have been identified from this research. Firstly, transport is both an enabler and outcome of tourism; this was seen at all scales. Secondly, transportation within tourism still heavily relies on motorised transport and aviation. Tourism contributes to around 8% of global greenhouse gas emissions between 2009-2013. Thirdly, Bangkok showed that variety of transport modes is more linked to attraction density; 91.1% of the grid cells had only one transport mode. Lastly, in Siberia it shows that local people have varied and mixed opinions towards roads as they can be seen as a lifeline but also cause fear of mass tourism. Overall this shows that accessibility cannot just be seen as distance and travel time. In Bangkok transport mode variety was a bigger factor than distance, but in Siberia different people value accessibility differently and it isn't always wanted. This supports Hopkins' (2019) idea that we should widen our analysis to look beyond tourist movement and include infrastructure, policy, non-tourist movement and local communities. Looking at accessibility (Dinu, 2018) is a good base point but fails to include externalities. This research also highlights that transport is very responsive to technological advancement (Dinu, 2018). However, technology can be very attractive but fail to deliver the whole picture (Hopkins, 2019). Electric vehicles will still rely on fossil fuels if the electricity is from coal, like-for-like vehicle replacement is unlikely to make any significant

changes and there can be rebound effects. In Bangkok this can be overcome by improving centrality in the network, transfers and local transport (walking/cycling/last mile). This supports Banister's (2008) focus on changing modes. In Bangkok there was too much reliance on a single mode (buses) and low centrality. In Siberia there is low population density meaning it is difficult to create a full public transport system. This shows that the decision to build new roads should be questioned. It should also be noted that this research is focused on urban areas (Iamtrakul et al., 2025). In cities policies should focus on integration and reliability, but in Indigenous remote areas policies should include consultation, zoning and restricted access. Communities already implement information signs at the boundaries of their territory (Kuklina et al., 2022). This provides real evidence for Hopkins' (2019) focus on justice. Local people know exactly who is coming, how and if they have permission. Roads can be both a lifeline and cause of fear. Infrastructure can also clash with sacred landscapes (Ukok plateau case study). If transport and tourism planning is focused on increasing tourism growth (Dinu, 2018) then there is a risk of overlooking issues, and there can be an uneven distribution of costs and benefits (labour precarity and local subsidisation of tourist infrastructure (Hopkins, 2019)).

This has shown that the sustainable mobility paradigm (Banister, 2008) to overcome the need to travel, change mode, reduce journey distances and increase efficiency may need to be developed further to apply to tourism. There is still no paradigm to overcome tourism mobility (Hopkins, 2019). This review indicates that questions around justice should be included to determine who benefits from new infrastructure, who pays the costs and who has decision making power. This is a proposal but can be tested further. It also challenges the accessibility paradigm (Dinu, 2018) as increased accessibility can be a negative if communities prefer isolation and sacred/protected landscapes. Overall 4 conclusions have been drawn from this synthesis;

Integrate different modes and improve reliability in urban areas. Focus on areas with multiple modes and local transport (Iamtrakul et al., 2025).

Direct measures should be taken to overcome reliance on aviation and motorised transport. Offsetting does not attract many people to participate (Hopkins, 2019).

Externalities should be considered along with non-tourist movements (freight, waste, labour) (Hopkins, 2019).

In Indigenous and remote areas free, prior and informed consultation should be done with the local community. Differentiate between types of tourist and type of road (Kuklina et al., 2022).

These are all different scales and should be combined. Integrating modes in urban areas won't overcome emissions from aviation, and consultation won't overcome congestion in a megacity. A co-ordinated transport and tourism policy should be created to overcome the issues at each scale. However, there are limited sources in this review and each study focuses on a different scale. The attraction database in Iamtrakul et al. (2025) is biased towards famous attractions and data is confidential. Kuklina et al. (2022) note that there is little research on the impact of roads on young people leaving the area and the relationships between tourism and industrial companies. Dinu's (2018) data is secondary and descriptive. Future research could include; (a) Combining spatial network analysis and traveller/community

perception, (b) Testing integration and last mile strategies, (c) Investigate immobilities, labour and extra transport outside tourism, (d) Compare destinations in the global south and north and (e) Assess the impact of rebound effects and new technologies (automation/sharing).

6. Conclusion

Four studies show that transport is an important element of tourism. However, the transport systems are not sustainable and are currently dominated by car and air transport. Sustainable tourism transport systems should be a diversity of transport, good connectivity and reliability. Concentrating on high demand areas, low impact and consensus in fragile areas. There should also be consideration of justice and non-tourism movements.

Three main conclusions can be taken from this review. By using conceptual, economic, spatial and community data it can provide a better understanding. Transport systems must be diverse, reliable and have local consensus to improve accessibility. The review brings together the sustainable mobility paradigm and mobility justice. In practice there should be integrated transport systems with reliable points of access in urban areas. Pricing and regulatory strategies are needed to increase demand driven transport and decrease car and aviation. Indigenous areas should be consulted, zoned and have restricted access. Further research should be done to bring together spatial network analysis with traveller and resident perspectives. This will provide insight on immobile and non-tourism movements. Future research should also compare destinations from the global south and north.

As the studies were deliberately selected the conclusions should be seen as analytical theories. However, they do show that sustainability will not be achieved through technological and growth. Sustainability relies on the accessibility of the transport system, how and with consensus.

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