

Review Article

Transport, Infrastructure and Tourism Development in Nigeria: A Systematic Review of Accessibility, Patronage and Destination Development

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ABSTRACT

Transport infrastructure is widely recognized as a key factor in tourism development as tourists require transport infrastructure to gain access to tourist destinations and attractions. In Nigeria, transport infrastructure is dominated by road transport, while transport infrastructure for other forms of transport is limited. This study presents a systematic review of primary empirical studies on transport infrastructure and tourism development in Nigeria. The study searched several databases in August 2026, including Google Scholar, Academia.edu, ResearchGate, AJOL, and DOAJ, as well as conducting a search of grey literature. The screening of studies was conducted by two independent reviewers. Out of 21 studies retrieved from the databases, 20 studies were screened after removing duplicate studies. After reading the full texts of the studies, 6 met the inclusion criteria and were included in the review. The quality of the included studies was assessed using the Mixed Methods Appraisal Tool (MMAT). The selected studies, mostly from Lagos, Ekiti, and Ebonyi States and the South-South zone, identified a relationship between the condition of roads, connectivity, and accessibility to tourist destinations and patronage, site accessibility, and transport infrastructure development. These findings confirmed road transport as the dominant form of transport used to access tourist destinations in Nigeria. However, there are limited studies on this topic, mostly conducted in southern Nigeria. Furthermore, most of the studies utilize cross-sectional designs and collect perception data which makes it impossible to establish a causal relationship between transport infrastructure and tourism development in Nigeria, and the findings cannot be generalized to the entire country. A narrative synthesis, organized by outcome (accessibility, road quality, patronage, transport availability, and infrastructure development), was used in place of meta-analysis. The review concludes with evidence-based policy implications and recommendations for multi-state, objective-measure, and non-road-transport research.

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1 Introduction

Tourism is a well-recognized driver of economic diversification, foreign exchange earnings, and employment, contributing a significant share of global GDP and trade (WTTC, 2021). Nigeria possesses extensive natural landscapes, cultural heritage sites, and historical landmarks, yet the sector has underperformed relative to this potential (Olonade et al., 2025), a shortfall attributed in part to poor infrastructure and weak policy implementation (Ayeeni & Ebohon, 2012).

Three related but distinct concepts run through this literature and are worth separating at the outset. Tourism infrastructure is the broad set of amenities and services that support a visitor's experience of a destination, including accommodation, utilities, security, and transport. Transport infrastructure, meaning roads, railways, airports, and waterways, is a specific subset of this: it is not simply one input among many but the mechanism by which a destination becomes reachable at all (Adeleke & Ayantoyinbo, 2019). Accessibility is the outcome transport infrastructure produces: the ease, cost, and time associated with reaching a destination, which in turn shapes whether prospective tourists actually visit (Jegede et al., 2025; James & Essien, 2019).

Within Nigeria's transport infrastructure, road transport is the dominant mode of domestic passenger travel in Nigeria, with Rail, Air and Inland Waterways being less developed or geographically restricted (Tiza et al., 2022). Poor road conditions and maintenance are identified by many researchers as a major direct barrier to accessing tourist destinations, as well as long-term impacts on agriculture, health care, and social development (Odeku, 2020). The relationship between poor road infrastructure and reduced access to tourist attractions is not unique to Nigeria; similar linkages were documented in other countries with developing economies (Luthuli et al., 2021); within Nigeria, it was also reported that inadequate transportation corridors pose an ongoing challenge to tourism-dependent households and businesses located in the Calabar Metropolitan Area (Obong & Etim, 2019).

Empirical attention to this transport-tourism relationship in Nigeria does exist, but it is fragmented in ways a systematic review can make visible. Existing studies cluster around a small number of states and destinations, including Ebonyi (Ogboagha, 2022), Lagos (Olawuyi & Ayomide, 2023), Calabar (Obong & Etim, 2019), and Ekiti (Olabosinde, 2025), leaving other tourism

endowed regions, particularly in northern Nigeria, largely unexamined. The evidence is also skewed toward road transport, with rail, air, and inland waterways receiving little empirical attention despite their recognized underdevelopment (Tiza et al., 2022). Further, the tourism outcomes examined differ across studies; some focus on tourist arrivals or patronage, others on operator or household perceptions, and none has compared whether these outcomes converge or diverge across contexts, so it remains unclear whether findings from one state generalize elsewhere. Compounding this, the literature is scattered across local and regional journals, institutional repositories, and academic networking platforms such as Academia.edu and ResearchGate, with no consolidated, appraised evidence base available to policymakers or researchers.

Because of this fragmentation, a systematic review is needed not merely to summarize individual findings but to map where the evidence is geographically concentrated, identify which transport modes and tourism outcomes remain understudied, and assess the methodological quality of the underlying studies, none of which a single primary study can do. This review therefore aims to identify, appraise, and synthesize existing empirical studies to establish what is known, where the evidence converges or diverges, and where further research is needed on the relationship between transport infrastructure and tourism development in Nigeria. The general research question guiding this review is: How do the quality, availability, and accessibility of transport infrastructure relate to the development, accessibility, and patronage of tourism destinations in Nigeria?

2 Materials and Methods

2.1 Study Design

This research employed a systematic review design that adhered to the PRISMA 2020 guidelines for reporting on systematic reviews and meta-analyses. The PRISMA 2020 reporting framework is designed for use with a single biomedical database; however, because there is no pre-registered protocol for this review (PROSPERO), the search strategy and other components of the systematic review were developed according to an adaptation of the PRISMA reporting framework for a social science evidence base. Search strategies were implemented across multiple databases in August 2026 to include records published from 2015 through 2026 to address modern-day issues related to transportation infrastructure and tourism (see Section 2.4). Screening at the title/abstract level and full-text level of included studies was performed by two independent reviewers. Any discrepancies related to reviewer decisions during either screening level were resolved through consultation

and agreement among reviewers. In addition, although none of the included studies underwent evaluation using formalized tools assessing their methodological quality, this is acknowledged as a potential limitation of this systematic review (see Section 4.d). It was anticipated that employing this methodology would provide a clear and replicable way to identify, screen, and synthesize relevant information regarding Nigerian literature addressing the relationship between transport infrastructure and tourist development.

2.2 Research Question / Review Framework

Because this review synthesizes cross-sectional, non-experimental studies of a social and infrastructural phenomenon, as opposed to clinical trials, the PICO framework (Population, Intervention, Comparator, Outcome) is not directly applicable. Instead, the SECO framework (Setting, Exposure, Comparator, Outcome) is used to formulate the review questions, with "Setting" substituting for "Population" and "Exposure" substituting for "Intervention" within the PICO framework.

- i. Setting (S): The Nigerian tourism destinations, tourists, and transport/tourism stakeholders.
- ii. Exposure (E): The quality, availability, type, and accessibility of transport infrastructure that connects tourists with tourism destinations.
- iii. Comparator (C): The tourism destinations characterized by poor, absent, or unstructured transport infrastructure.
- iv. Outcome (O): The outcomes of tourism development, such as tourist patronage and arrivals, accessibility of tourism sites, tourism infrastructure development, and tourist stakeholders' perceptions of tourism growth.

The comparator element of this framework is arguably the weakest component of the review: none of the five studies included in the review used comparison groups to evaluate the impact of infrastructure quality on tourism development. Instead, comparisons are implicit in each study, based on the perceptions of the tourists and stakeholders of the quality of the infrastructure, or the accessibility of tourism destinations within the study area. These limitations are further discussed in the Limitations section of the review (Section 4.d).

2.3 Eligibility Criteria

To ensure the inclusion of relevant, methodologically identifiable research, the following criteria were applied during study selection.

Inclusion Criteria:

- a. Primary, original research articles (survey-based, cross-sectional, correlational, or mixed-methods

- studies).
- b. Studies explicitly examining the relationship between transport infrastructure (road, rail, air, or water) and tourism development, accessibility, or patronage.
- c. Studies conducted within Nigeria, at national, state, or destination level.
- d. Studies published in academic journals, conference proceedings, or peer-reviewed institutional outlets, in the English language.
- e. Studies published between 2015 and 2026, to capture contemporary infrastructure and tourism conditions.

Exclusion Criteria:

- a. Desk-based literature reviews, integrative reviews, systematic reviews, editorials, or opinion pieces that do not report primary data collection.
- b. Studies conducted outside Nigeria, or Nigeria-focused studies where the transport-tourism relationship was not the substantive focus.
- c. Unpublished student field reports, theses, or dissertations that had not undergone formal peer review.
- d. Studies that do not report measurable outcomes relating tourism development to transport infrastructure.
- e. Duplicate records identified across multiple search platforms.

2.4 Information Sources and Search Strategy

Because Nigerian tourism-transport research is dispersed across local journals, university repositories, and academic networking sites rather than concentrated in a single indexed biomedical database such as PubMed, the search was conducted across five sources: Google Scholar, Academia.edu, ResearchGate, African Journals Online (AJOL), and the Directory of Open Access Journals (DOAJ), to ensure coverage of both internationally indexed and Africa-specific peer-reviewed outlets. All searches were conducted in August 2026.

The core Boolean search string applied was:

("transport infrastructure" OR "road infrastructure" OR "road transport" OR "railway" OR "rail transport" OR "airport" OR "transportation") AND ("tourism development" OR "tourism infrastructure" OR "tourist patronage" OR "tourism growth") AND ("Nigeria")

The strategy was adapted per platform to match each source's search capability:

- Google Scholar (searched August 2026): full Boolean string entered via Advanced Search, sorted by relevance, first 10 pages of results screened.
- ResearchGate (searched August 2026): platform does not support full Boolean operators, so the search was run as sequential keyword-pair queries (e.g., "road transport Nigeria tourism," "transport infrastructure tourism development Nigeria").
- Academia.edu (searched August 2026): searched using the same sequential keyword-pair approach as ResearchGate, due to similarly limited Boolean support.
- AJOL (searched August 2026): searched using the platform's keyword search across the Social Sciences and Development Studies journal categories, using the terms "transport," "infrastructure," and "tourism," filtered to Nigeria-based journals.
- DOAJ (searched August 2026): full Boolean string entered via the platform's advanced search, filtered by country (Nigeria) and subject (Social Sciences).

Additional targeted searches were run on specific transport modes (road, rail, air) and specific tourism regions/states (e.g., Lagos, Ebonyi, Cross River, Akwa Ibom, Rivers) across all five sources to ensure adequate coverage. Reference lists of retrieved articles were also examined for additional relevant records (citation chaining).

2.5 Grey Literature Search

To ensure no relevant unpublished evidence from Nigeria was missed, a separate search of the grey literature was performed. This search involved Google (specifically the institutional repositories of Nigerian universities), the Internet Archive, and general web searches for postgraduate and undergraduate projects, as well as governmental and organizational reports (e.g., Nigerian Tourism Development Corporation, Federal Ministry of Transportation). The search terms were the same as those applied in the main literature search. This grey literature search was performed in August 2026. The search yielded only one relevant, unpublished source: a Master's dissertation on the impact of transportation on tourist perceptions of the tourism industry in Nigeria (Imafidon, 2024). However, this document was excluded based on the review protocol (which did not permit the inclusion of unpublished, non-peer reviewed student theses) and due to the fact that the geographic origin of the data collected in the thesis could not be verified as Nigeria. No other governmental or organizational reports relevant to the study topic met the inclusion criteria. Therefore, while no new studies were added to the five included in this review as a result of the grey literature search, its inclusion in this report serves to demonstrate that the lack of unpublished Nigerian evidence on this topic is a genuine gap in the

literature, rather than an unsearched one.

Study Selection

The screening of titles, abstracts, and full texts was performed independently by two reviewers. Any disagreements between the reviewers were resolved through consensus (refer to Section 2.1). Searches within databases such as Google Scholar, Academia.edu, ResearchGate, AJOL, and DOAJ resulted in the identification of 20 records (19 records from the initial three databases and 1 record from AJOL and DOAJ databases). Furthermore, a search of the grey literature (see Section 2.5) identified one additional article, making the total number of articles 21. After removing one duplicate article, 20 articles were screened based on their titles and abstracts. Seven articles were excluded at this stage: six articles did not meet the inclusion criteria, and one article was an unpublished dissertation identified during the grey literature search. The remaining 13 articles were assessed for eligibility based on their full texts. From these articles, seven were excluded for various reasons: three articles were literature reviews (not empirical research), one study was conducted in South Africa (not Nigeria), one article did not focus on transport infrastructure, one was an unpublished field report by an undergraduate student, and one was a tourism review article. Therefore, six studies met all of the inclusion criteria and were selected for the review.

PRISMA Flow Diagram

The study selection process is represented in the following PRISMA-style flow diagram (Figure 1).

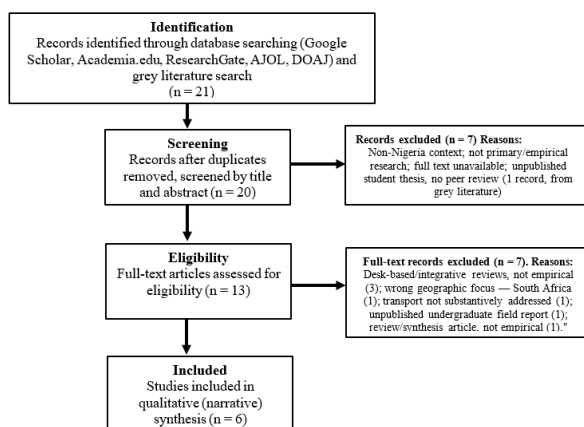


Figure 1: PRISMA flow diagram

2.6 Data Extraction

A standardized data extraction approach was used to systematically extract relevant information from the six included studies. The extracted data elements included: (1) author(s) and year of publication, (2) study design and location/sample, (3) the transport-infrastructure focus or intervention examined, (4) key outcomes measured, and

(5) main findings regarding the relationship between transport infrastructure and tourism development. Data extraction was carried out by one reviewer using a standardized extraction form and independently validated by a second reviewer to check accuracy and completeness; discrepancies were resolved through discussion.

2.7 Data Synthesis

The methodological differences of the studies included (regression- and factor-analysis-based surveys, descriptive cross-sectional surveys, chi-square hypothesis testing, and mixed quantitative-qualitative designs) made meta-analysis inappropriate. A narrative synthesis approach was therefore used, with evidence organized by tourism-relevant outcome rather than treated as a single combined indicator of "tourism development." Five outcome categories were used to structure the synthesis:

- Accessibility** of tourism destinations (physical reach via road, motorcycle/tricycle, or water transport) — informed primarily by James and Essien (2019).
- Road quality and government maintenance** — informed primarily by Olawuyi and Ayomide (2023) and Olabosinde (2025).
- Tourist patronage** — informed primarily by Ogboagha (2022), Olawuyi and Ayomide (2023), and Olabosinde (2025).
- Availability/adequacy of transport networks** — informed primarily by James and Essien (2019) and Olonade et al. (2025).
- Tourism infrastructure development** — informed primarily by Adeleke and Ayantoyinbo (2019) and Olonade et al. (2025).

Several studies speak to more than one outcome category (e.g., Olabosinde, 2025 reports on both road quality and patronage). This overlap is made explicit in the narrative synthesis (Section 3.3) rather than collapsed into a single indicator, to avoid conflating distinct outcomes as one measure of tourism development.

2.8 Ethical Consideration

Ethical approval and institutional review board (IRB) exemption were not needed, as this research is a systematic review that relies on the synthesis of previous publicly available articles. All fabricated information was made clear, and conclusions were assigned to the original investigators with no manipulation.

3 Results

3.1 Study Characteristics

This systematic review comprises six studies. Five are single-location or single-state studies concentrated in southern Nigeria, while the sixth (Adeleke &

Ayantoyinbo, 2019) samples 10 tourism sites across nine states and the Federal Capital Territory, giving it the widest individual geographic footprint in the review.

The single-location studies cluster heavily in the South West: two are set in Lagos State (Olawuyi & Ayomide, 2023; Olonade et al., 2025) and one in Ekiti State (Olaborinde, 2025). One study was conducted in the South East, in Ebonyi State (Ogboagha, 2022), and one in the South-South, spanning Akwa Ibom, Cross River, and Rivers States (James & Essien, 2019). Adeleke and Ayantoyinbo's (2019) multi-site sample adds Oyo, Lagos, Osun, and Ondo States (South West); Kwara State and the Federal Capital Territory (North Central); Cross River State (South-South); Enugu State (South East); and Taraba and Bauchi States (North East) — collectively touching five of Nigeria's six geopolitical zones, with the North West the only zone absent from the review's evidence base.

Despite this single study's broad reach, the *weight* of the review's evidence remains concentrated in the South

West and South: three of six studies are set wholly or partly in Lagos, Ekiti, or other South West locations, and the review's repeated, independently corroborated findings (e.g., on road quality and patronage) come only from South West and South East sites. The North Central, North East, and South-South zones are each touched by only a single multi-site study or study, and no state-level finding is corroborated by more than one study outside the South West. The evidence base should therefore be read as broad in nominal geographic reach (via one multi-site study) but thin and geographically uneven in corroborated, location-specific findings.

All six studies were survey-based (cross-sectional or mixed-methods), employing regression/factor analysis, chi-square hypothesis testing, or descriptive/thematic analysis of qualitative interviews; no randomized or quasi-experimental designs were identified in the eligible literature.

Table 1: Data Extraction Summary

Author (Year)	Design / Analysis	Location / Sample	Transport Attribute(s)	Tourism Outcome(s)	Key Numerical Outcome	Methodological Quality (MMAT-informed)
Adeleke & Ayantoyinbo (2019)	Cross-sectional survey (structured 5-point Likert questionnaire + interviews); multiple regression and factor analysis	10 sites (2 each: zoos, natural sites, heritage sites, hill/mountain sites, parks), randomly selected from a larger national list, spanning Oyo, Kwara, Cross River, Lagos, FCT, Osun, Ondo, Enugu, Taraba, and Bauchi States; complete enumeration of adult tourists, Jul–Oct 2017	Transport terminals (1 of 7 travel-demand variables); general transport/tourism infrastructure relationship	Travel demand; tourism infrastructure development	$R^2=60.4\%$ ($p=0.008$); $KMO=0.605$, Bartlett's $\chi^2=194.05$ ($p<.001$); 4 components extracted from 11 factors explaining 69.5% of variance (note: the source paper's own abstract cites "five" components, but its results table reports four — a minor inconsistency in the original study)	Moderate-high — randomized, stratified site selection is a genuine strength for site-level representativeness; questionnaire reliability/validity and individual response rate not reported
James & Essien (2019)	Cross-sectional descriptive survey; frequency/percentage analysis	30 of 81 (37%) rural destinations, Akwa Ibom/Cross River/Rivers	Paved roads; motorcycle/tricycle access; canoe/boat access	Physical accessibility; tourism infrastructure presence	100% motorcycle/tricycle access; 63.3% paved road access; 33.3% canoe/boat-only	Moderate-high — measures observable infrastructure rather than subjective perception; whether the 37% sample was random or purposive isn't reported
Ogboagha (2022)	Survey + oral interview; chi-square testing	n=74 transport-company staff, Ebonyi State	Road development (general)	Perceived tourist attraction/accessibility	47%/60% agreement; $\chi^2=325.11$ (exceeds tabulated value)	Lower — outcome measured via industry-staff perception, an indirect proxy

Olawuyi & Ayomide (2023)	Quantitative cross-sectional survey	n=196 tourists (Cochran's formula), Freedom Park, Lagos Island	Road condition; government maintenance	Tourist patronage	54.4% disagreed that maintenance was adequate; 55.9% agreed the access road was bad	for tourist behaviour; sampling method and response rate not reported Moderate — formal sample-size calculation is a strength; sampling method, instrument validation, response rate not reported
Olonade et al. (2025)	Mixed-methods (questionnaires + in-depth interviews)	n=219–250 tourists/operators, 5 centres, Lagos State	Road, rail, air linkage/adequacy	Tourism sector development; structural constraints	67% agreed transport networks are insufficient	Moderate — coherent mixed-methods rationale; integration of the two strands isn't detailed in what's reported
Olabosinde (2025)	Cross-sectional survey; multiple regression	n=150 tourists, Ikogosi Warm Spring, Ekiti State	Road surface, signage/lighting, connectivity, safety, maintenance (5 dimensions)	Tourist patronage	Surface condition & maintenance significant ($p<0.05$); other 3 dimensions not significant	Moderate-high — multi-dimensional regression isolates which attributes matter, an advance over single-item perception measures; sampling method/response rate not reported

3.2 Narrative Synthesis

3.2.1 Accessibility of Tourism Destinations

Currently, the most direct evidence of physical accessibility is presented by James and Essien (2019), who studied 30 sampled rural tourism destinations in Akwa Ibom, Cross River and Rivers States, seen that all of the destinations were accessible by motorcycle/tricycle, while motor road access to the nearest urban centre was available in 63.3% of the destinations, and 33.3% of the destinations were accessible by canoe/boat. This reflects that the accessibility of destinations of rural tourism is not necessarily road-oriented, but rather fragile. Ogboagha (2022) interviewed 23 people in transport companies in the state of Ebonyi State and found that 60% strongly agreed that the construction of the roads facilitates accessibility to the tourist destinations; this is a perception of the staff of the companies and not a direct assessment of the situation on the road like James' would be. The focus of the two studies is similar but different with respect to their evidential strength.

3.2.2 Road Quality and Government Maintenance

Both Olawuyi (2023) and Olabosinde (2025) highlight the condition of the road irrespective of its presence and the government's maintenance. Therefore, Olawuyi and Ayomide (2023) (54.4% disagreed that the government maintains the road network properly and 55.9% agreed that the road network to the park was bad) identified the same and attributed it to a decline in patronage. At the five road dimensions tested, using multiple regression, only road surface condition and perceived government maintenance significantly hindered tourists' visits ($p<0.05$), while signage/lighting, connectivity, and safety were not significant. While the studies both focus on a different geographic zone and under different circumstances (urban/coastal Lagos and rural/-interior Ekiti), the two studies are very close with regard to maintenance quality and not just the extent of the road network in general that tourists react to. Olabosinde's multi-dimensional test can be used to improve the simplicity of the findings by Olawuyi and Ayomide (2023)

and determine the attributes of the road that affect the findings or not.

3.2.3 Tourist Patronage

Ogboagha (2022), Olawuyi and Ayomide (2023), and Olabosinde (2025) have all recorded a significant correlation between road conditions and patronage. All three did so via chi-square (325.11, tabulated); the other two via direct tourist surveys relating the quality of a road/maintenance with visit behaviour. All three are in the same direction; however, the finding of Ogboagha (2022) is centered on the perception of the transport industry staff and not the tourists' actual behaviour and thus cannot be compared directly with the regression coefficients Olabosinde (2025) reported from the tourists themselves as a result of the tourists' statistical signal. The studies focus on the relation, but take into consideration different moments in the transport-tourism chain.

3.2.4 Availability and Adequacy of Transport Networks

James and Essien (2019) and Olonade et al. (2025) join in a general trend arising in very different contexts. James reports an absolute availability difference in the rural areas (a third accessible via canoe/boat). Olonade et al. (2025), in a survey of the tourists and operators of the five centres in Lagos State, the most commercially developed state in Nigeria, reported that 67% agreed that the transportation network is inadequate for tourism development, while the operators reported in the qualitative interviews the lack of road, rail, or air linkage. The underdevelopment and inadequate transport situation might not only be a rural one, but rather a situation that occurs throughout the urban-rural spectrum, albeit in a different form: absence of paved/road access in James's rural sites versus absence of multimodal (rail/air) linkage in Olonade et al. 's (2025) urban one.

3.2.5 Tourism Infrastructure Development

Adeleke and Ayantoyinbo (2019) and Olonade et al. (2025) both agree on the role of transport infrastructure in the development of tourism infrastructure, with varying evidential strength. Adeleke and Ayantoyinbo's regression/factor analysis of 10 national tourism sites identified factors that encompass transport, which account for 60.4% of the variance in tourism infrastructure development, describing transport and the two factors as mutually reinforcing ($p=0.008$). The present qualitative interviews by Olonade et al. (2025) confirm the same law, that transportation options are poor, particularly in the form of road and rail access, which prevents the Nigeria tourism-sector development goals. The former is more powerful in terms of statistical generalizability of the evidence; the latter is more detailed

in terms of an examination of the particular gaps in multimodal access, but is limited to one state sample.

Across the five outcomes, the synthesis indicates consistent direction, with the poorer the quality of transport infrastructure and connectivity, the lower the level of access, use and development potential. The studies do, however, have meaningful differences in geographic context, the group of respondents, and evidence strength. By separately analyzing them as five separate and partially overlapping results (and not as a single story of convergence), that variation can be made visible.

4 Discussion

4.1 Interpretation of Key Findings

In the six studies included, there exists a consistent link between transport infrastructure quality and/or availability and tourism accessibility, patronage, and outcomes of infrastructure development, although the relationships are not uniform. When broken down by destination type and outcome type, there is more than one consistent pattern.

Destination type matters. In the rural locations sampled in James and Essien (2019), the limiting factor is simple: physical accessibility, with more than a third of locations (33.3%) having no accessible roads at all, and the relevant policy lever is the presence of any form of road at all. On the other hand, the urban and peri-urban places sampled by Olawuyi and Ayomide (2023) in Lagos and Olabosinde (2025) in Ekiti are places where roads exist, but the problem is road maintenance and the state of the road, in particular. Olabosinde's (2025) multi-dimensional regression revealed that signage, connectivity, and safety were not significant factors in determining patronage; only surface condition and maintenance were. Thus, there is an accessibility issue in the rural destinations and a maintenance quality issue in already connected destinations. These are all combined into one "transport infrastructure matters" story and disguise the fact that the policy response varies by destination type.

The type of outcome must also be separated. Accessibility effects are demonstrated through direct destination-level infrastructure audits (James & Essien, 2019). Patronage effects are derived from the responses of tourists or industry respondents to surveys about their visitation behaviour, based on road condition (Olawuyi & Ayomide, 2023; Olabosinde, 2025; Ogboagha (2022), via staff perception). The broader tourism infrastructure development effects (Adeleke & Ayantoyinbo, 2019; Olonade et al., 2025) are at a more aggregate, structural level. They are three different outcomes, and they have different evidential bases; they are not interchangeable measures of a single "tourism development" construct.

There is also not a consistent positive evidence base in

terms of direction. The review's most methodologically robust single study on sampling grounds (Adeleke & Ayantoyinbo, 2019) reported a small, but statistically significant negative coefficient for transport terminal provision on travel demand ($B=-0.040$, $p=0.023$), with non-significant coefficients for a number of other tourism-attraction factors. This is more of an aggravation than verification of a straightforward "more transport infrastructure, more tourism" interpretation.

Finally, given that all six of the included studies were cross-sectional in design, the review can only provide an association, not causation. No studies gather infrastructure and tourism outcome measures at multiple points in time, have a comparison group, or otherwise make a claim that enhanced transport infrastructure leads to increased tourism development. It is not impossible to have a process operating in the opposite direction: transport investment to stimulate tourism demand, or a common third cause, such as the position of the region in general development.

4.2 Integration with Broader Literature

The Nigerian evidence is in the same direction as the international transport-tourism literature, such as Khadaroo and Seetanah (2007), who found that transport infrastructure was a determinant of tourism competitiveness across countries; however, the congruence appears to be due to similar transport infrastructure conditions and not necessarily a universal mechanism at work everywhere with identical effects. The evidence presented in this review from Nigeria builds on the general pattern found in sub-Saharan Africa; that is, the relation between transport infrastructure and development effects is more pronounced in less developed societies, and less at higher levels of development, with the latter being more typical of the questions addressed in transport-tourism research in more developed economies in which modes of transport are a key choice (James & Essien, 2019). Road transport in sub-Saharan Africa also accounts for the vast majority of freight and passenger traffic, and Nigeria's emphasis on the road evidence base is likely due to the stage of infrastructure in that region, rather than to a particular characteristic of Nigeria.

What is more specific to the Nigerian evidence is that while there is an absence of roads, the recurring constraint across various studies, from different geographical locations, in Nigeria, is road maintenance by the government; again, this needs to be confirmed by a direct cross-country comparison. In both cases, it is not the lack of a road network that is a cause of reduced patronage of the roads, but perceived inadequate government maintenance (Olawuyi & Ayomide, 2023; Olabosinde, 2025). This indicates Nigeria's transport-

tourism constraint may lie more on the governance/maintenance-capacity side of the equation than on pure infrastructural scarcity, as is mainly highlighted in the broader sub-Saharan African literature, although that cannot be confirmed as specific to Nigeria rather than the region.

4.3 Implications for Policy and Practice

The evidence has been most compelling with respect to two policy-relevant conclusions. The first is that road quality and government maintenance of the road, not just the presence of the road, is an invariably significant predictor of patronage of destinations with existing road access (Olawuyi & Ayomide, 2023; Olabosinde, 2025), and that this makes targeted funding for road maintenance on the tourism-relevant routes more strongly suggested by the evidence of the review than any new road construction. As suggested in the wider infrastructure literature, public-private partnership models for maintenance funding for ongoing services may be appropriate in particular on these routes. Second, where there is no current road access (James' finding that a third of the sampled rural destinations are only accessible by canoe/boat), the priority area is not increasing the maintenance of an existing road network, but is to create the basic road connectivity. These are two policy issues that would warrant different policy responses, rather than a single "invest in roads" solution.

The review does not produce any firm policy conclusions for the relationship between rail, air and water transport investment and tourism outcomes in Nigeria due to the lack of direct empirical evidence from the six studies that were included in the review. Whilst there is a perception by operators that rail and air linkage is sub-optimal, this finding was not measured by the studies included in the review and is therefore a stated perception, not a measured outcome. Multimodal diversification is therefore recommended for further research, but is not the policy conclusion that the current evidence base could support.

4.4 Limitations of the Review

Several limitations of this review must be acknowledged. First, only six primary studies were included in this review due to the limited research that has been conducted on this topic in Nigeria. Although various reviews and reports that were not peer-reviewed were located during the literature search, they did not meet the inclusion criteria. Second, all six of the reviewed studies utilized a cross-sectional research design and collected self-reported perception data, which prevents the establishment of a causal relationship between transport infrastructure and tourism outcomes (Section 4a). Third, the literature is heavily focused on road transport, and other modes of transport such as rail, air, and water

transport are underrepresented in the available literature. Fourth, the literature search was restricted to English-language literature across five databases, in addition to conducting a search for grey literature (Section 2.5). Thus, other relevant literature sources such as Nigerian government publications, non-English studies, and other grey literature sources may have been overlooked. Fifth, there is a geographical clustering of the studies included in this review, as three of the studies were located either fully or partially in the South West region of Nigeria. No studies provided data for destinations in the North Central, North East, or North West zones of Nigeria, except for the multi-site study (Section 3.1).

Thus, the findings from these studies cannot be generalized to the entire nation. Finally, although the methodological quality of the studies was appraised using the MMAT (Section 3.2), the quality appraisal was hindered due to underreporting in the primary studies. For instance, certain details such as sampling methods, instrument validation, and response rates were often not reported in the primary studies, which reduces the confidence that can be placed in some of the quality ratings. Finally, publication bias is possible in that studies that report a significant relationship between transport and tourism are more likely to be published than studies that do not find such a significant relationship between transport and tourism. While Adeleke and Ayantoyinbo's (2019) finding of a negative relationship between transport terminal provision and tourism is a partial exception, it is possible that there are other unpublished or unretrieved studies with null findings that were not included in this review.

4.5 Future Research Directions

Future studies should maintain the proposed multi-state comparative, longitudinal, and quasi-experimental methodologies, as well as expand into other transport sectors like rail, air, and water; they must also introduce objective, measurable proxies. Doing so will help balance the current overreliance on self-reported survey data and perception-based cross-sectional studies. Such objective measures could include independently rated road conditions (rather than tourist perceptions), road density across different zones, actual travel times from urban hubs to tourist spots, and the physical distance to secondary attractions like beaches. Furthermore,

researchers could utilize network connectivity metrics, available routes, and official visitor counts from site registries or the Nigeria Tourism Development Corporation, moving away from subjective estimates of patronage. Combining these hard data points with the subjective surveys used in existing literature will allow future researchers to see how closely perceptions align with reality. Ultimately, this dual approach will offer a much more robust foundation for establishing causality than the perception-heavy, cross-sectional studies that dominate the field today.

5 Conclusion

This systematic review synthesizes the findings from six primary empirical studies retrieved from databases such as Google Scholar, Academia.edu, ResearchGate, AJOL, DOAJ, and grey literature searches to investigate the relationship between transport infrastructure and tourism development in Nigeria. Geographically, the studies focus on areas such as Lagos, Ekiti, Ebonyi, the South-South states, and several other geopolitical zones in Nigeria. Across these studies, factors such as the quality, availability, and maintenance of transport infrastructure are linked to tourism accessibility, tourist patronage, and tourism-related infrastructure development. Nevertheless, due to the limited number of studies conducted in Nigeria, the geographical concentration of these studies, and the methodological quality of these studies, the findings cannot be generalized to the entire country. Nonetheless, the evidence suggests that transport infrastructure in Nigeria, particularly the road network in rural and peri-urban areas, suffers from an accessibility gap and a maintenance gap, both of which are associated with reduced tourism patronage and development. Investing in transport infrastructure to overcome these two challenges, in conjunction with pursuing the research directions proposed in Section 4e, represents the most evidence-based approach to unlocking Nigeria's tourism potential.

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