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MODELLING THE ECONOMIC INFLUENCE OF TRANSPORT SYSTEM ON TOURISM PERFORMANCE. THE EXPERIENCE FROM LAGOS STATE, NIGERIA

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Abstract

Globally, travel and tourism opportunities are highly sought-after by most nations, but very few developing nations, including Nigeria, play good supporting roles to benefit from the profitable and lucrative industry. The

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reasons for this are not unconnected to the poor investment in tourism infrastructure, especially transport, to support tourism activities and sustain tourism performance. It is against this background that this study modeled the economic influence of the transport system on tourism performance using Nigeria's Lagos State experience. This study is anchored on an ex-post facto research design and relies on quantitative data from the relevant ministries of the Lagos State Government. Both descriptive (charts and graphs) and inferential (multiple linear regression analysis) statistics were methods of data analysis. Major findings revealed that only the annual revenue from transport system services out of the nine (9) evaluated performance indicators showed internal consistency and a positively increasing growth pattern. Furthermore, research found that the level of transport investment has a statistically significant relationship with the performance of the tourism industry ($F\ \frac{7}{4}\ 112.112, p = 0.000 < 0.05$). *Meanwhile, findings also revealed that there is a statistically significant relationship between the transport system's revenue and tourism performance* ($F\ \frac{4}{7}\ 31.696, p = 0.000 < 0.05$). *Given these, this study affirmed that the tourism performance greatly depends on the transport system's investment and revenue and concluded that the fluctuating and poor tourism performance in Lagos State, Nigeria, is a function of the transport system's economic influence. Thus, this study recommends, among others, consistent investment and improvement in the transport system, most especially the infrastructure that will support tourism activities and increase tourism revenue.*

Keywords: *Lagos State, Nigeria, transport system, tourism, tourism performance*

JEL Classification: R40, R49, Z30, Z32

Introduction

Transport systems will no doubt continue to play crucial and pivotal roles in the development, growth, performance, and sustainability of tourism activities across the globe. The importance of transport systems to the development and growth of tourism activities is crystal clear, as it directly facilitates the formation of tourism activities, the linking and movement of tourists to and from destination zones, as well as the movement of goods, services, and other materials that are necessary for

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the successful accomplishment of tourism activities [Dogan, Ozkan-Demircan, & Altunoglu-Tokatli, 2017; United Nations World Tourism Organization [UNWTO], 2019]. According to Salisu, Odewumi, and Abdul-Azeez [2022], the attributed services offered by the transport systems, including road, rail, air, water, and telecommunications, bring economic returns in the form of revenue to the tourism industry and thus improve the industry's overall performance. Meanwhile, Page [2009] observed that the level of transport system advancement and adequate investment in transport infrastructure, specifically facilities, promote the sustainability of tourism activities. Hence, the role of transport systems in tourism development and performance cannot be overemphasized.

Ultimately, previous research has established the role of transportation in enhancing tourism development both in developed and developing nations. Some of these studies that have identified the economic impact of transport on tourism include those of Adeola and Evans [2020]; Kantawateera, Naipinit, Sakolnakorn, & Kroeksakul [2017]; Sorupia [2005]; Ndikom [2008]; Page [2009]; Pratiwi [2018]; Salisu [2019]; Salisu et al. [2022]; Virkar and Mallya [2018]. Those that have dealt with the role of transport modes such as air and water in tourism performance but not limited to Eichner and Greaves [2018]; LaMondia, Snell, ad Bhat [2009]. While the studies of Eichner and Greaves [2018], Malik and Awadallah [2013], and Oloruntobi, Safizahanin, and Zaly-Shah [2019] investigated the role of transport infrastructure, including the network and terminals, in enhancing tourism performance, Despite these, there are still a number of research gaps that need to be addressed in the area of transport and tourism in developing communities, including Lagos State, Nigeria. Of interest in this study is the empirical evidence of the economic effect of transport systems on the tourism industry in Lagos State, Nigeria. Understanding the economic influence of transportation on tourism performance is an important area of study, particularly in developing nations such as Nigeria where the tourism industry has significant potential for economic growth.

In other words, tourism performance is a key driver of economic growth and development in many countries, including Nigeria. Lagos State, which is the economic and commercial hub of Nigeria, has been witnessing a significant increase in tourism activities, as shown in the international tourist arrival data (over 1.4 million international visitors in 2021) and the increasing proliferation of various tourist attractions and support facilities across the state. Despite these, the tourism industry in Lagos State has been subjected to underdevelopment with low or discretionary revenue and poor economic benefits in the areas of employment

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creation (contributed 3.36 million jobs in 2019 and fluctuated around 2.19 million, 2.43 million, and 3.21 million jobs in 2020, 2021, and 2022, respectively), market sales, infrastructural provision, and environmental preservation of the immediate host communities following the poor transport infrastructure investment and mobility issues [Salisu et al., 2022]. In the quest to address the poor performance of the tourism industry in Lagos State and evolve policy and investment strategies to enhance tourism performance in Lagos State, this study on the economic influence of the transport system on tourism performance in Lagos State, Nigeria, becomes important.

This study examined the economic performance of the transport and tourism industries based on nine (9) key performance indicators between 2000 and 2021 sourced from relevant ministries of the Lagos State Government, the statistically significant relationship between transport investments and the performance of the tourism industry, and the statistically significant relationship between the transport system's revenue and tourism performance in Lagos State, Nigeria. The findings would be valuable in shaping policies and investment strategies that support the development of a sustainable transport system for tourism in Lagos State, Nigeria. Additionally, the study provides insights that would help to improve tourism performance and ensure the long-term sustainability of the tourism industry through adequate transport system planning and investment. The paper is structured into five sections; following the introductory section, Section 2 provides a brief literature review, highlighting the existing knowledge on the relationship between transport and tourism in Lagos State, Nigeria, and identifying the research gap that needs to be addressed. Section 3 outlines the research methodology, including data collection procedures and data analysis techniques. Section 4 presents and analyzes the data, using both descriptive and inferential statistics. Finally, Section 5 gives the conclusions and recommendations on the need for targeted policies and investment strategies to enhance the transport system and support the growth of tourism development in Lagos State, Nigeria.

Literature Review

Numerous studies have examined the relationship between transport and tourism and how transport infrastructure affects the performance of the tourism industry. The focus on this topic is especially relevant in developing nations, where tourism is seen as a promising sector with significant economic impacts [Adeola & Evans, 2020]. A study by Salisu et al. [2022] suggests that the poor quality of transport infrastructure can limit the growth of the tourism industry. The study

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found that inadequate road transport infrastructure can discourage tourists, hinder the flow of goods and services, and ultimately reduce tourism performance. Furthermore, according to a study by Kantawateera et al. [2017], transport development is a critical factor for promoting tourism in low- and middle-income countries. Khadaroo and Seetanah [2007]; Kantawateera et al. [2017]; and Salisu et al. [2022] argued that transport infrastructure, such as airports, roads, and railways, plays a vital role in attracting tourists and creating employment opportunities in the tourism sector. Additionally, a study by Fang et al. [2015] shows that a country's transport network can significantly enhance the competitiveness of its tourism industry. The study found that a well-developed transport system can increase the number of tourist arrivals, the length of stay, and the amount of money spent by visitors. This, in turn, has positive effects on employment, economic growth, and the overall development of the local communities.

In the case of Lagos State, Nigeria, a study by Oloruntobi et al. [2019] found that inadequate transport infrastructure and poor service quality of public transport modes are a major challenge for tourism development in the Lagos region. The study indicates that poor road networks, insufficient public transport options, and limited accessibility to tourist sites have resulted in low tourism performance in Lagos State. Similarly, a study by Eichner and Greaves [2018] notes that the Lagos transport system requires significant improvement, especially in the areas of public transport and infrastructure, to support the tourism industry and promote economic growth. Overall, the literature shows a consensus that transport is an essential component of tourism development, even in developing nations. Improvements in the transport system can increase visitor arrivals, enhance the visitor experience, and ultimately boost the economic and social benefits of tourism. Addressing the challenges faced by Lagos State, Nigeria, and other developing nations in improving transport infrastructure will be critical to unlocking the potential of the tourism sector and realizing its economic benefits.

Methodology

This section presents the information on study area and discusses the research design, sources of data, method of data collection, presentation and analysis under the methods sub-section.

Study area

The study centered on Lagos State, which is the most populous state in Nigeria, estimated at a population figure of 15,388,000 [National Bureau of Statistics,

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2022], is located in the southwestern part of Nigeria on the Atlantic Coast in the Gulf of Guinea and west of Niger & River Delta at longitude $3^0$45E and latitude $6^0$35N. This state is bounded in the east and north by Ogun State; in the west by the Republic of Benin; and in the south by the Atlantic Ocean, which gives several opportunities for tourism and water transport potential. Lagos State is classified into five (5) five regional divisions: Ikeja, Ikorodu, Lagos Island, Epe and Badagry with twenty (20) twenty local government areas (LGA) and 57 local council development areas (LCDA) in 2003. Specifically, Lagos State is characterized by six (6) transport modes, namely road, water (inland water and maritime), air, rail, pipeline and cable transport (still under construction), with several travel means including Bus Rapid Transit and noticeable transport infrastructure. Unfortunately, none of the functional modes of transport in Lagos State specifically runs tourism related services or could serves as mobility means for tourists as well as a tourist destination. In terms of tourism potential, Lagos state is home to several attractions classified as historical monuments, beaches, museums, cultural and annual festivals, with a total score of more than 150 attractions but with 90 notables ones [Lagos State Government, 2022].

Methods

This study is anchored on an ex-post facto research design, which is a type of observational study in which the researchers do not have control over both independent and dependent variables. In this study, longitudinal data on nine (9) transport and tourism key performance indicators, namely expenditure on transport infrastructure, direct revenue on local tourism patronage, tourism investment cost, number of tourist arrivals, revenue on trade activities, revenue on accommodation and food services, revenue on art, entertainment, and recreation, revenue on telecommunication, and revenue on transport services, were sourced from the Lagos State Bureau of Statistics and the Ministry of Tourism, Arts, and Culture for a period of 22 years (2000–2021). Out of the nine (9) observed KPIs, two (2) are directly related to transport economic variables, namely expenditure on transport infrastructure and revenue on transport services, while seven (9) independent variables, which include direct revenue on local tourism patronage, tourism investment cost, number of tourist arrivals, revenue on trade activities, revenue on accommodation and food services, revenue on art, entertainment, and recreation, and revenue on telecommunication, aggregately measured tourism performance. In other words, this study relies only on the quantitative data collected using

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secondary sources such as official economic reports and databases of the Lagos State Government.

Both descriptive (charts and graphs) and inferential (multiple linear regression analysis, MLR) statistics were methods of data analysis. The descriptive statistics were used to present the trend pattern and behavior of the information presented in the dataset, while the inferential statistics, specifically multiple regression analysis, were used to test the hypothetical statements, which are: there is no statistically significant relationship between transport investments and the performance of the tourism industry; and there is no statistically significant relationship between revenue from the transport system and tourism performance in the study area. Furthermore, the findings from the data analysis, presented in a clear and concise manner using tables, charts, and graphs, were based on the research questions. However, the study has two major limitations, which are limited data availability, the potential for confounding variables, and the difficulty experienced in obtaining the information from the secondary sources. In other words, the limitations were acknowledged in the study to provide context for the findings and recommendations.

Results and Discussion

This section presents the results and discussion with inference to the literature and in line with the study objectives, which are the economic performance of the transport and tourism industries based on the nine (9) key performance indicators; the statistically significant influence of transport investment on the performance of the tourism industry; and the statistically significant influence of transport service revenue on tourism performance in Lagos State, Nigeria.

Economic performance of transport and tourism industry

Figure 1 presents the descriptive analysis through charts in order to comprehend the dataset's internal consistency and economic growth pattern. Findings from Figure 1 revealed that there is no internal consistency and a positive growth rate in the observed dataset for almost all the performance indicators, as there is total fluctuation in the observed dataset. Only the data on annual revenue from transport services showed internal consistency and a positive economic growth rate. The reason for these observed fluctuations might not be unconnected to so many factors that include but are not limited to poor record keeping and data banking on transport and tourism activities, corruption and related sharp practices, poor management information, and the sudden emergence of the COVID-19 global pandemic.

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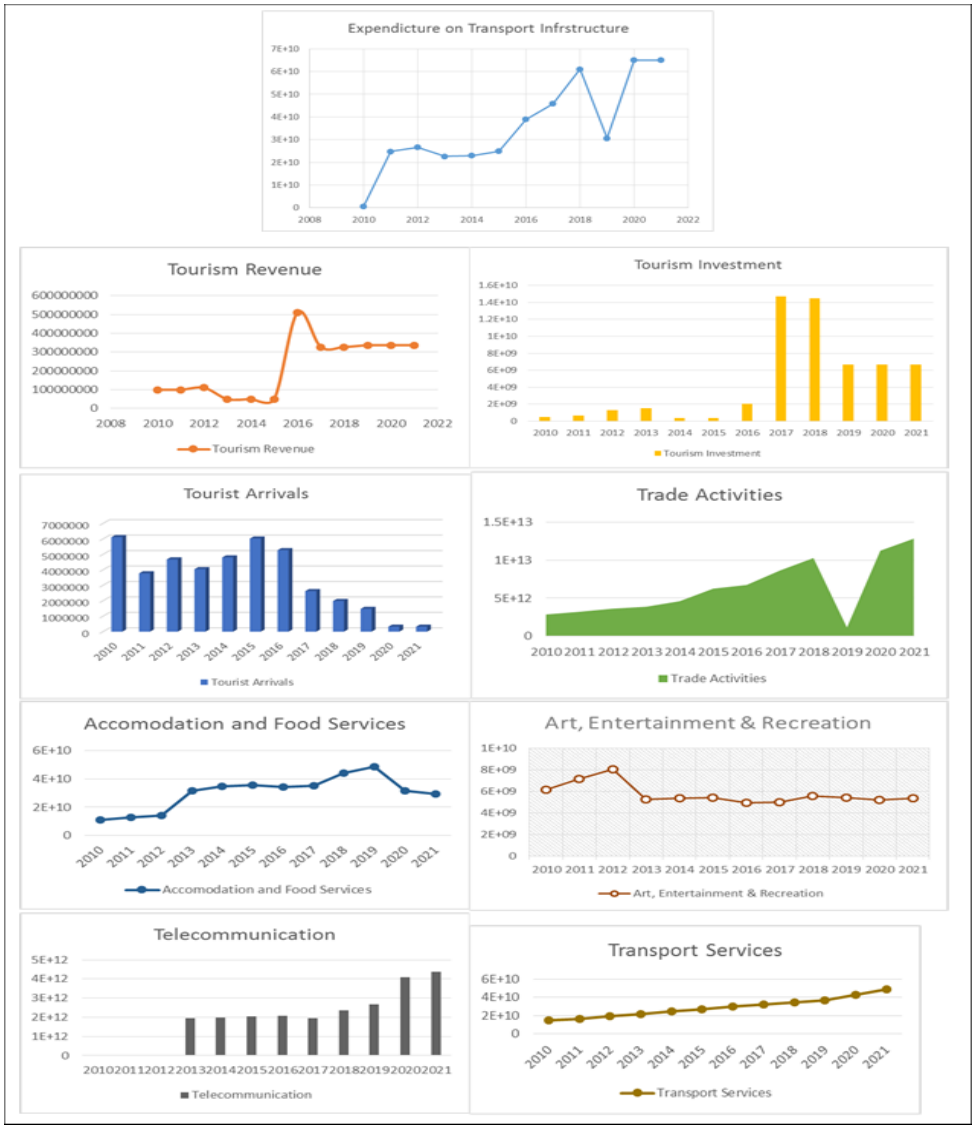

Figure 1: Transport infrastructure capital expenditure and tourism performance indicators in Lagos State

Source: Field Survey, 2022

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Statistical significant relationship between transport investments and the performance of tourism industry

H_0: *There is no statistically significant relationship between transport investments and the performance of tourism industry*

In a bid to understand and establish the statistically significant relationship between transport investments and the performance of the tourism industry, multiple regression analysis was used to explain and model the significance outcome of the relationship between the dependent and independent variables. The dependent variable, which is the transport investment [TRI], is measured by the total expenditure on transport infrastructure, while the independent variables, also known as predictor variables, are direct revenue on local tourism patronage [RTP], tourism investment cost [TIC], number of international tourist arrivals [NTA], revenue on trade activities [RTA], revenue on accommodation and food services [RAFS], revenue on art, entertainment, and recreation [RAER], and revenue on telecommunication [RoT]. Both the dependent and independent variables are continuous data, which is appropriate for MLR analysis.

The results:

The result presented in Table 1 shows the 'R' value representing the multiple regression correlation coefficient, which measured the quality of the prediction of the dependent variable 'transport investments", revealed a value of 0.897, indicating a good level of prediction. The R square (R^2) value representing the coefficient of determination, which measures the proportion of the variance in the dependent variable that can be explained by the independent variables, shows 0.895. This means that the independent variables were able to explain 89.5% of the variability of the dependent variable (transport investments). Meanwhile, the adjusted R square (Adj. R^2), which revealed 0.886, or 89%, shows the model's accuracy of prediction.

ANOVA test of significance

The F-Ratio in the ANOVA Table 1, which tests for the overall significance of the regression model as a good fit for the regressed data revealed, $F\ \frac{7}{4}\ 112.112$ and reaches significance with p-value of 0.000. While comparing the ANOVA results, the findings show that the observed and calculated p-values are less than

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the table p-value of 0.05 ($p = 0.000 < 0.05$).). Hence, the decision to accept the H_1 (alternative hypothesis) and reject the H0 (null hypothesis). This implies that there is a statistically significant relationship between transport investments and the performance of the tourism industry in Lagos State, Nigeria.

Estimated model coefficient

The results of the unstandardized coefficient (β), which indicates how much the dependent variables vary with an independent variable when all other independent variables are held constant, and which are presented in Table 1 (the coefficient table), show that for each decrease or increase in the independent variables (key performance variables of the tourism industry), there is a decrease or an increase in the dependent variable (transport investments TRI). Hence, the general form of the equation to predict transport investment (a dependent variable) from independent variables (the performance of the tourism industry) is predicted as;

TRI = - 10601992007.561 + 8496.033*RTP - 7741.856*NTA + 0.005*RTA - 0.048*RAFS - 0.012*RoT

Statistical significance of the independent variables

The results of the statistical significance of each unstandardized or standardized coefficient for independent variables that measures the contribution to the model were also established, and the results are also presented in Table 1. Through the t-value and corresponding p-value, the study shows that 5 out of the 7 predictor variables are statistically significant and have a value different from 0 (zero). Thus, the 5 variables best contributed significantly to the model's prediction. As such, the five (5) predictor variables that contribute significantly to the model include revenue on local tourism patronage [RTP] (t = 6.542, p=0.003), number of international tourist arrivals [NTA] (t =5.455, p=0.005), revenue on trade activities [RTA] (t = 9.392,p=0.001), revenue on accommodation and food services [RAFS] (t = 5.271,p=0.006), revenue on telecommunication, [RoT] (t= -3.646, p=0.022).

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Table 1. Relationship between transport investments and the performance of tourism industry

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.897[a]	.895	.886	2360841700.878

a. Predictors: (Constant), Telecommunication , Tourism Investment, Tourism Revenue , Trade Activities, Art, Entertainment & Recreation, Accommodation and food services, Tourist Arrivals

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	43740349366120 56000000.000	7	624862133801722 300000.000	112.112	.000[b]
	Residual	22294294146426 806000.000	4	557357353660670 1600.000		
	Total	43963292307584 83000000.000	11			

a. Dependent Variable: Transport Investment

b. Predictors: (Constant), Telecommunication , Tourism Investment, Tourism Revenue , Trade Activities, Art, Entertainment & Recreation, Accommodation and food services, Tourist Arrivals

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	-10601992007.561	16898265692.412		-.627	.564
	Tourism Revenue	8496.033	1298.743	.671	6.542	.003
	Tourism Investment	-1.117	.442	-.295	-2.524	.065
	Tourist Arrivals	-7741.856	1419.322	-.801	-5.455	.005
	Trade Activities	.005	.000	.876	9.392	.001
	Art, Entertainment & Recreation	3.065	1.964	.146	1.561	.194
	Accommodation and food services	.048	.009	.501	5.271	.006
	Telecommunication	-.012	.003	-.875	-3.646	.022

a. Dependent Variable: Transport Investment

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Statistical significant relationship between transport system's revenue and tourism performance in the study area

H_0: There is no statistically significant relationship between revenue from the transport system's revenue and tourism performance in the study area

In a bid to understand and establish the statistically significant relationship between transport system revenue and tourism performance, multiple regression analysis was used to explain and model the significance outcome of the relationship between the dependent and independent variables. The dependent variable, which is the transport system's revenue [TSR], is measured by the annual revenue from transport services, while the independent variables, also known as predictor variables, are direct revenue from local tourism patronage [RTP], revenue from trade activities [RTA], revenue from accommodation and food services [RAFS], and revenue from art, entertainment, and recreation [RAER], all of which measure tourism performance in Lagos State. Both the dependent and independent variables are continuous data, which is appropriate for MLR analysis.

The results:

The result presented in Table 2 shows the 'R' value representing the multiple regression correlation coefficient, which measured the quality of the prediction of the dependent variable 'transport system's revenue and revealed a value of 0.973, indicating a good level of prediction. The R square (R^2) value representing the coefficient of determination, which measures the proportion of the variance in the dependent variable that can be explained by the independent variables, shows 0.948. This means that the independent variables were able to explain 94.8% of the variability of the dependent variable (transport system's revenue TSR). Meanwhile, the adjusted R square (Adj. R^2), which revealed 0.918 and represents 92% accuracy, shows the model's accuracy in making predictions.

ANOVA test of significance

The F-Ratio in the ANOVA Table 2, which tests for the overall significance of the regression model as a good fit for the regressed data revealed, $F\ \frac{7}{4}\ 31.696$ and reaches significance with p-value of 0.000. While comparing the ANOVA results, the findings show that the observed and calculated p-values are less than the table p-value of 0.05 ($p = 0.000 < 0.05$). Hence, the decision to accept the H_1

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(alternative hypothesis) and reject the H_0 (null hypothesis). This implies that there is a statistically significant relationship between transport system's revenue and tourism performance in Lagos State, Nigeria.

Estimated model coefficient

The results of the unstandardized coefficient (β), which indicates how much the dependent variables vary with an independent variable when all other independent variables are held constant, which are presented in Table 2 (the coefficient table), show that for each decrease or increase in the independent variables (key performance variables of the tourism industry), there is a decrease or an increase in the dependent variable (the tourism system's revenue TSR). Hence, the general form of the equation to predict the transport system's revenue (a dependent variable) from independent variables (tourism performance indicators) is predicted as;

$$TSR = -963137100.796 - 958.294*RTP + 0.526*RTA + 0.269*RAFS$$

a. ***Statistical significance of the independent variables***

The results of the statistical significance of each unstandardized or standardized coefficient for independent variables that measures the contribution to the model were also established, and the results are also presented in Table 2. Through the t-value and corresponding p-value, the study shows that 3 out of the 4 predictor variables are statistically significant and have a value different from 0 (zero). Thus, the 3 variables best contributed significantly to the model's prediction. As such, the three (3) predictor variables that contribute significantly to the model include direct revenue from local tourism patronage [RTP] ($t = -3.381$, $p=0.012$), revenue from trade activities [RTA] ($t = 5.856$, $p=0.001$), and revenue on accommodation and food services [RAFS] ($t = 7.983$, $p=0.000$).

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Table 2. Relationship between Transport System's Revenue and Tourism Performance

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.973[a]	.948	.918	859368504.52749

a. Predictors: (Constant), Telecommunication , Tourism Investment, Tourism Revenue , Trade Activities, Art, Entertainment & Recreation, Accommodation and food services, Tourist Arrivals

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	93632719057366830000.000	4	23408179764341707000.000	31.696	.000[b]
	Residual	5169599586016726000.000	7	738514226573817980.000		
	Total	98802318643383550000.000	11			

a. Dependent Variable: Transport System's Revenue
b. Predictors: (Constant), Accommodation and Food Services, Trade Activities, Tourism Revenue , Art, Entertainment & Recreation

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-963137100.796	4119612688.461		-.234	.822
	Tourism Revenue	-958.294	283.425	-.505	-3.381	.012
	Trade Activities	.000	.000	.566	5.856	.001
	Art, Entertainment & Recreation	.526	.514	.167	1.024	.340
	Accommodation and food services	.269	.034	1.064	7.983	.000

a. Dependent Variable: Transport System's Revenue

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Conclusion and Recommendations

This study has modeled the economic influence of the transport system on tourism performance in Lagos State, Nigeria. Specifically, it examined the economic performance of the transport and tourism industries based on nine (9) key performance indicators between 2000 and 2021, sourced from relevant ministries of the Lagos State Government; the statistically significant relationship between transport investments and the performance of the tourism industry; and the statistically significant relationship between the transport system's revenue and tourism performance in Lagos State, Nigeria. Major findings revealed that only the annual revenue from transport system services out of the nine (9) evaluated performance indicators showed internal consistency and a positively increasing growth pattern. Furthermore, the research found that there is a statistically significant relationship between transport investments and the performance of the tourism industry in Lagos State. Meanwhile, findings also revealed that the revenue from transport system services had a statistically significant relationship with tourism performance in the study area. This implies that both transport investment and transport system's revenue have a significant influence on tourism performance in the study area.

In conclusion, this study highlights how transport plays an essential role in boosting tourism activities and overall industry performance. The findings demonstrate clear evidence linking higher levels of transport investment with improved outcomes in the tourism industry while emphasizing how generating more revenue through quality transport system services can lead to better results within the tourism sector too. As such, it is crucial for policymakers to prioritize investments in transport systems, especially transport infrastructure and travel modes service facilities, as they work towards promoting not only tourism development and sustainability, but also sustainable urban development across their respective regions of the state. It is believe that improved investment in transport system would enhance the accessibility and mobility to and around tourist destinations in the state. These include but not limited to construction of dedicated right of way for road modes for tourism activities, expansion of existing airports with more attracting facilities, development of new seaports and jetties that can accommodate cruise ships and development of new railway lines and expansion of train services for tourists patronage. The study also recommended the need for better record keeping, particularly in the areas of transport and tourism, towards understanding the trend pattern and behaviour of the sectors performance.

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Improvement in record keeping would also give accurate record for better transport and tourism comprehensive plan which in the long run will promote the sectors productivity.

Furthermore, this study recommends the need for immediate integration of transport system projects into tourism project provisions for better development and sustainability of the transport and tourism industries in Lagos State, Nigeria. The full integration of the transport system projects financing and implementation would also give room for strategic planning for the tourists each of mobility and accessibility, safety and security, experience and satisfaction as well as enhancing the use of alternative energy sources and advance technology innovation for tourism activities in Lagos State. In other words, this study recommends the development of a full comprehensive transport plan that takes into account the needs, growth and sustainability of the tourism industry in the State. The plan is expected to prioritize the development of transport infrastructural facilities, such as airports, seaports, jetties, road terminals, roads, rail stations, telecommunications networks and first-and-last mile facilities leading to tourist attractions, the travel modes to destinations cities (such as buses, trains, cars, mini buses, trams, ferries, aircraft, tunnel etc.) and dedicated travel means for each of first and last mile mobility around and within the destinations zones (auto rickshaw, motor coach, share taxi, ride hailing, cable car, taxi, trolley buses, walking and cycling) for tourism patrons and increasing both transport tourism revenue for the Lagos State, Nigeria.

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