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Adoption of Eco-Friendly Transport in India: An Empirical Analysis of Consumer Attitudes and Behaviour

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ABSTRACT

The intensifying environmental concerns and global commitments to reduce carbon emissions have positioned green transportation technologies as pivotal solutions for sustainable mobility. The transition toward green transportation not only contributes to environmental preservation but also supports economic growth, public health, and energy security. This empirical study investigates the behavioural, economic, environmental, and social determinants influencing consumer adoption of green transportation solutions, such as electric vehicles (EVs) and hybrid mobility platforms. Grounded in three key theoretical frameworks—the Theory of Planned Behaviour (TPB), the Technology Adoption Model (TAM), and the Diffusion of Innovation (DOI) theory—this research seeks to assess the complex interplay between consumer attitudes, intentions, social norms, and actual adoption behaviours. Data were collected through structured questionnaires from a sample of 103 respondents across five major Indian metropolitan cities: Chennai, Bengaluru, Hyderabad, Mumbai, and Kolkata. The study employed a quantitative methodology using descriptive analysis, correlation, and multiple regression through IBM SPSS. Variables measured included economic incentives, environmental awareness, social norms and values, attitudes toward adoption, perceived behavioural control, intention to adopt, and actual adoption behaviour. The regression analysis revealed that attitude towards green transportation emerged as the only statistically significant predictor of actual adoption behaviour ($p = 0.025$), indicating that a favourable consumer mindset plays a pivotal role in the transition to sustainable mobility. Interestingly, economic and environmental factors—though often emphasized in public discourse—were not found to be significant drivers in isolation. Social factors showed marginal influence ($p = 0.090$), suggesting a cultural dimension where peer influence and social validation may shape behavioural outcomes. Additionally, the study identified a considerable gap between intention, perceived behavioural control, and actual adoption behaviour, as evidenced by paired t-test results. These findings underscore the importance of bridging the cognitive-perceptual gap to translate intention into action. The conceptual framework tested within this research offers a practical model for stakeholders, including policymakers, marketers, and transportation authorities, to design targeted interventions. Policy recommendations emerging from this study emphasize the need for consumer education campaigns, improved green transport infrastructure, and community-based marketing to enhance attitudinal shifts and trust in emerging technologies. By providing empirical insights into consumer preferences and barriers, this research contributes to the broader literature on sustainable transportation in emerging economies. It advocates for a behavioural-centric approach to green mobility that complements financial and policy mechanisms. Ultimately, fostering a culture of pro-environmental behaviour is essential for advancing India's sustainable urban development goals.

Keywords: Green Transportation, Consumer Behaviour, Adoption, Electric Vehicles, Theory of Planned Behaviour, Technology Adoption Model, India, Sustainability, Environmental Awareness, Social Norms

INTRODUCTION

In recent years, traffic volumes have increased in most cities in India. This was accompanied by an increase in transportation emissions, affecting the environment and sustainability. Failure to address the sources of vehicle emissions will accelerate climate change and cause poor health conditions for transportation users and residents in areas with high pollution levels. The shift towards the use of green transportation has become one of the methods used to reduce the sources of pollution in India.

Green Transportation

Green transportation refers to eco-friendly and sustainable modes of travel that aim to reduce environmental impacts such as greenhouse gas emissions, air pollution, and energy consumption. This concept encompasses a range of practices and technologies including electric vehicles (EVs), hybrid cars, bicycles, public transit, carpooling, and the use of renewable energy sources. With increasing concerns over climate change, urban congestion, and fossil fuel dependency, green transportation has emerged as a critical component of global sustainable development strategies.

Governments, urban planners, and industries worldwide are investing in infrastructure and incentives to promote greener travel alternatives. Technological advancements in battery storage, smart mobility systems, and clean energy have further accelerated the adoption of green transportation. Moreover, consumer awareness regarding environmental sustainability and health benefits has significantly influenced travel choices.

With the trend of sustainable development becoming a global consensus, the whole world needs to shift to cleaner power and reduce the carbon footprint of the various sectors, especially the transportation sector. The development of electric vehicles (EVs) can provide a solution to the environmental and energy problems in urban areas. If we can sufficiently deploy EVs in cities, sustainable urban development will surely be a significant step forward. Greenhouse gas emissions from the transport sector accounted for 23 % of global energy-related CO2 emissions (International Energy Agency, 2023; 2024). Urban transportation, especially, is a key source of air pollution for the entire transport sector, whose health consequences are related to several respiratory diseases and even deaths before their time (World Health Organization, 2024). Now is the time to change, and EVs in urban areas can be an important solution to reduce environmental impacts and enhance health outcomes. Indeed, urban environments are the epicentres of the electric mobility revolution. Urban zones mark out places where people live in high density, where the transportation need is crucial, and where air pollution impacts the communities in a significant way (U.S. Department of Transportation, 2024).

Theory of Planned Behaviour (TPB)

The Theory of Planned Behaviour (TPB), proposed by Icek Ajzen (1991), is a widely used psychological theory that explains and predicts human behaviour based on three key determinants: attitude toward the behaviour, subjective norms, and perceived behavioural control. According to TPB, an individual's intention to perform a specific behaviour is the most immediate predictor of that behaviour. This intention is influenced by the person's positive or negative evaluation of performing the behaviour (attitude), perceived social pressure to engage or not engage in the behaviour (subjective norms), and the perceived ease or difficulty of performing the behaviour (perceived behavioural control). The TPB framework has been extensively applied in diverse domains such as health, environment, marketing, and technology adoption, offering a structured way to design interventions and policy measures by targeting the underlying cognitive factors influencing intention and behaviour. In the context of this research, TPB provides a robust theoretical foundation to explore individual decision-making processes and predict behavioural outcomes with empirical clarity.

Technology Adoption Model (TAM)

The Technology Adoption Model (TAM), developed by Davis (1986), is a foundational framework used to understand how users come to accept and use a new technology. TAM posits that two primary factors influence an individual's intention to adopt a technology: Perceived Usefulness (PU) – the degree to which a person believes that using the technology will enhance their performance, and Perceived Ease of Use (PEOU) – the degree to which the person believes that using the technology will be free of effort. These perceptions shape the user's attitude toward using the technology, which in turn influences their behavioural intention and actual usage.

In the context of the present study on, TAM provides a relevant theoretical lens to examine how consumers evaluate green transportation technologies such as electric vehicles, shared mobility platforms, or hybrid systems.

Consumers are more likely to adopt these technologies if they perceive them as both beneficial (e.g., cost-effective, environmentally friendly) and user-friendly (e.g., easy to operate, accessible infrastructure). By incorporating TAM, this research aims to identify the cognitive and motivational factors that drive or hinder the acceptance of green transportation, thereby informing policy and marketing strategies for sustainable mobility solutions.

Diffusion of Innovation Theory (DOI)

The Diffusion of Innovation (DOI) Theory, proposed by Everett Rogers (1962), explains how, why, and at what rate new ideas and technologies spread within a social system. This theory is instrumental in understanding the consumer adoption process. According to DOI, adopters of innovations can be categorized into five groups: Innovators, Early Adopters, Early Majority, Late Majority, and Laggards—each influenced by factors such as perceived advantages, compatibility with existing values, complexity, trialability, and observability. It provides a valuable framework for identifying the stages consumers go through when deciding whether to adopt sustainable transport solutions, such as electric vehicles, shared mobility, or hybrid transportation systems. This study aims to analyse the behavioural patterns and motivations behind consumers' readiness to embrace green transportation alternatives, offering practical insights into promoting sustainable mobility.

Research Rationale

This research is informed by the need to find sustainable strategies to reduce environmental degradation and more specifically in transportation (Huang et al. 2018). Due to the emerging effects of traditional transport systems on climate change, the elements that affect consumer acceptance of green technologies are important to consider (Söderholm, 2020). This study aims at establishing an understanding of the economic psychological and social factors that may influence or discourage consumer propensity towards green transportation options. Therefore, the research on these influences seeks to make the necessary recommendations on policies and marketing, which are relevant in the formulation of the best practices. These are strategic approaches aimed at increasing the use of environmentally friendly transport systems to support other measures of environmental conservation.

Research Questions

- How do economic incentives influence consumer decisions to adopt green transportation technologies?
- What is the relationship between environmental awareness and the adoption of sustainable transportation options?
- How do social norms and values affect consumer preferences and behaviour towards green transportation?

LITERATURE REVIEW

A synthesis of past literature regarding consumer behaviour and the usage of green transportation technologies were presented. Contemporary literature review aims to identify and describe different stakeholders' attitudes toward green transportation focusing on economic and non-economic factors, social, psychological, and environmental factors.

Studies such as Naseri et al. (2024) and Naseri et al. (2023) highlight that environmental attitudes, purchase price, and climate change awareness strongly influence EV purchase intentions. Recent studies have highlighted the significance of various factors in the adoption of both new and used EVs, including the presentation of GHG (Greenhouse Gas) information (Farajnezhad et al., 2024; Vega-Perkins et al., 2023), behavioral attitudes and personal beliefs about climate change (Bhutto et al., 2022; Irfan, 2024) which provides consumers with insights into the environmental benefits of EVs. Additionally, moral foundations motivate consumers with pro-environmental values to exhibit stronger intentions to purchase electric vehicles (Dong et al., 2024). Customer satisfaction and psychological factors play pivotal roles in determining repurchase intentions within the automotive industry (Bryła et al., 2023). Social, economic, demographics and external factors play a significant role in shaping EV adoption patterns. Age, income, education, access to charging infrastructure, and government incentives substantially affect EV satisfaction and purchase intention (Singh et al., 2020).

Economic Factors Influencing Adoption

As per Söderholm, (2020), economic conditions also have a great impact on the use of green transport technologies as most people compare the cost of such technologies. The initial cost of green vehicles, especially electric cars, is still very expensive. Some of them are higher than the costs of regular vehicles, because of items such as batteries and complex drivetrain.

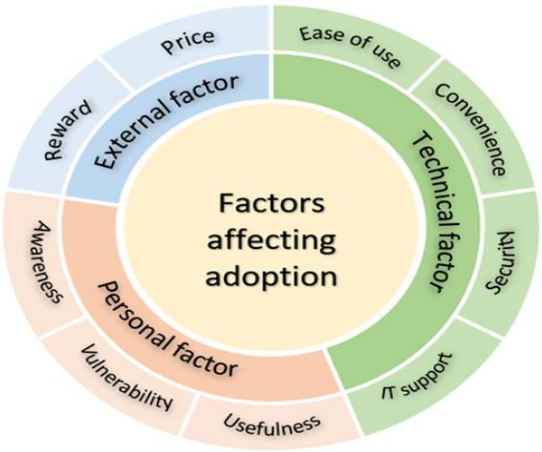


Figure 1
Source- (Zeng et al. 2022)

Zeng et al. (2022) argued that this high initial investment may be unaffordable to middle and lower-income earners and therefore economic status becomes a predictor of the level of adoption. Concerning the perceived economic implications, encouraging financial incentives such as tax credits, rebates, and low-interest loans that would enhance the perception of the green vehicle. Due to government subsidies there is an increase in the rate of adoption. There are considerable ongoing cost savings related to the operation of green vehicles including, amongst others, low fuel costs and minimal expenses on maintenance.

However, Heydari et al. (2021), stated that consumers' awareness of these savings is different, which defines their willingness to adopt. Another aspect of economics includes the number of social infrastructure facilities, including charging stations, that are available. Offering multiple points of access and easy reach makes consumer's perception of risks low hence increasing consumers' perception of feasibility of the green technologies in economic activity. On the other hand, lack of infrastructure forms a big limitation as it discourages potential users who may be perceiving it as inconvenient and unreliable. Altogether, economic factors like initial costs, financial incentives, operating savings and infrastructural availability play a vital role for consumers and hence it is crucial to understand the adoption trends of green transportation technologies.

Social and Psychological Influences

According to Huang et al. (2018), several social and psychological factors significantly contribute to the likelihood of consumers embracing green transport technologies. These are individual attitudes, subjective norms, perceived behavioural control and personal norms that relate to pro-environmental behaviour. Both permanent and temporary factors arise from peer pressure, family, and community influence consumer buying influence tremendously. This is because when prominent people or companies support green technologies, they compel others to adopt those technologies.

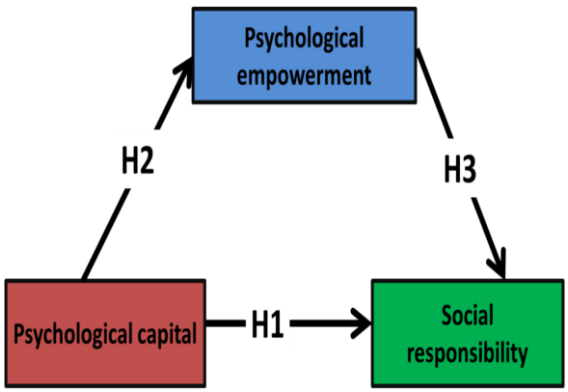


Figure 2
Source- (Hansen et al. 2018)

The principles of social proof are evident here, as the widespread presence and the perception of the desirability of green vehicles can influence the adoption rate. Attitudinal factors like environmental consciousness, perceived ease of use, and perceived usefulness also influence the adoption of the system. The theory of planned behaviour postulates that perceived behavioural control over green technologies and personal attitudes towards

them based on the values held by the individuals are the best predictors of intention to adopt green technologies. Customers who perceive that adoption of the green technologies is consistent with their environmental ethic or decreases their carbon impact are ready to embrace those technologies.

Hansen et al. (2018) stated that perceived behavioural control, determined by how easy or difficult the consumer perceives the adoption to be, also impacts decisions. If consumers find the process as complex or inconvenient, they will not adopt it, irrespective of their favourable attitude towards green technologies. The perceived control of technology implementation is influenced by factors such as information availability, reliability, and access to supportive structures like charging points. Therefore, increasing perceived ease of adoption is crucial to prompt consumer involvement in green transportation technologies by providing clear information and up-to-date and reliable infrastructure.

Environmental Awareness and Policy Impact

According to Boudet, (2019), political consciousness and political stance affect people's perceptions of green transport technologies. Concern over climate change, air pollution, and resource depletion has increased in recent years, raising awareness of environmental problems with conventional modes of transportation and necessitating a switch to sustainable ones like our product. It has fostered consumer acceptance of green transport solutions that reflect semantic congruence with the call for minimizing the negative impact on the environment. Government consent to green technology is characterized by environmental policies such as carbon levies, emission limits, and environmental restrictions.

As per Githinji, (2019), policies consequently have different effects on the rate of adoption depending on consumer attitudes. Positive behavioral change is more likely to be fostered by carrot techniques that use incentives, such as tax exemptions, rebates, or subsidies, to encourage green technologies. It is essential to consider consumers' motivating factors and values and focus on the positive consequences of the policies as opposed to punitive measures.

Author	Title	Findings	Literature Gap
Huang et al. (2018)	Eco-driving technology for sustainable road transport	Review of eco-driving technologies and their impact on sustainability.	Lacks detailed consumer behaviour analysis related to eco-driving adoption.
Söderholm (2020)	The green economy transition: the challenges of technological change for sustainability	Discusses challenges in transitioning to green technologies within the economy.	Limited focus on transportation technologies and their specific barriers.
Taiebat et al. (2018)	A review of energy, environmental, and sustainability implications of connected and automated vehicles	Explores the sustainability implications of connected and automated vehicles.	Does not explore adoption patterns among different consumer groups.
Cox et al. (2020)	Life cycle environmental and cost comparison of current and future passenger cars	Compares life cycle costs and environmental impacts of passenger vehicles under different energy scenarios.	Does not examine how consumer perceptions of costs influence adoption rates.
Newman & Gough (2020)	Systematic reviews in educational research: Methodology, perspectives, and application	Explores methodologies in systematic reviews for educational research.	Lacks a focus on green technologies or transportation-specific research methodologies.
Kamarudin & Mat Noor (2023)	Selection of action research methodologies in primary science education: A systematic literature review	Review of action research methodologies in primary science education.	Not focused on consumer behaviour or green transportation adoption.
Gunnars (2021)	A large-scale systematic review relating behaviourism to digital technology in primary education	Connects behaviourist theories with digital technology adoption in education.	No application to consumer behaviour related to green technologies or transportation.

Musharraf (2023)	Methodology of receiving dictations using different methods in primary classes	Discusses teaching methods in primary education.	Unrelated to consumer behaviour or green transportation technologies.
Angchay et al. (2024)	International Journal of Engineering Technology Research & Management	Provides engineering research insights.	Lacks focus on consumer behaviour and green transportation technologies.
Fink (2022)	Why and how online experiments can benefit information systems research	Highlights the use of online experiments in information systems research.	Does not consider green transportation technology or its adoption patterns.
Gronau, Ly & Wagenmakers (2020)	Informed Bayesian t-tests	Discusses statistical tests and methodologies.	Does not address consumer adoption or behaviour in the context of green transportation.
Maldonado & De Witte (2022)	The effect of school closures on standardised student test outcomes	Analyses the impact of school closures on student test performance.	Unrelated to transportation technologies or consumer behaviour.
Kelter (2021)	Bayesian and frequentist testing for differences between two groups	Focuses on statistical testing between two groups using parametric and nonparametric methods.	No application to green transportation technologies or consumer preferences.
Barbosa et al. (2024)	Defining content marketing and its influence on online user behaviour	Studies content marketing's impact on online behaviour.	Lacks focus on green transportation or consumer adoption of sustainable technologies.
Vebrianto et al. (2020)	Mixed Methods Research: Trends and Issues in Research Methodology	Discusses trends in mixed methods research in education.	Does not address green transportation adoption or sustainability issues.
Wohlin & Runeson (2021)	Guiding the selection of research methodology in industry-academia collaboration in software engineering	Explores research methodologies in industry-academia collaborations within software engineering.	Does not consider the green transportation sector or consumer adoption trends.
Islam, Khan & Baikady (2022)	Principles of Social Research Methodology	Discusses general principles of social research methodology.	Does not focus on green transportation or consumer behaviour towards sustainability.

Research Gap

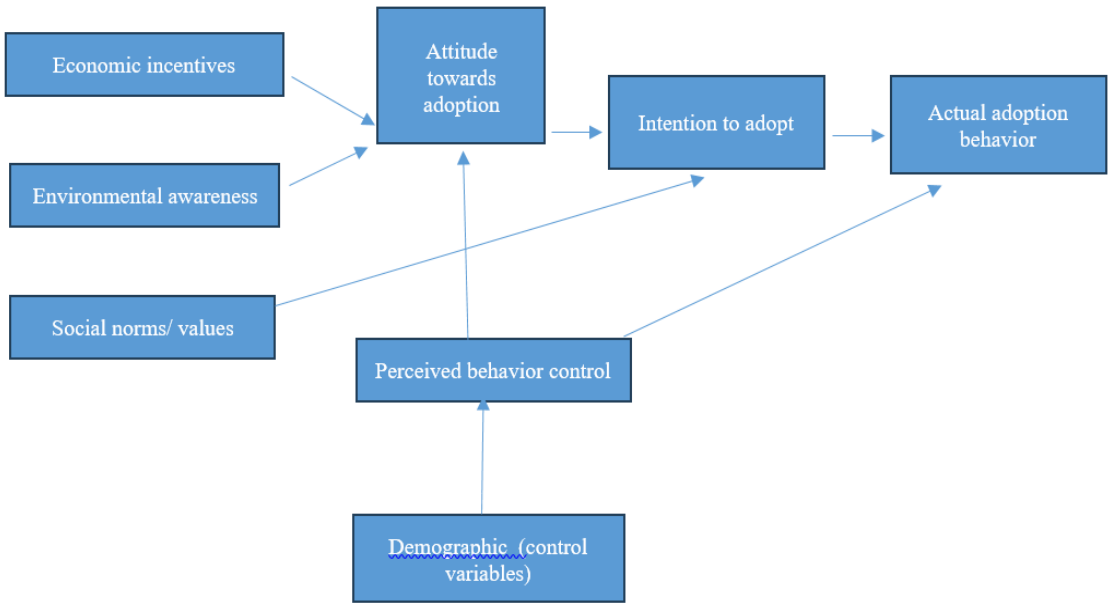
Researchers have paid much attention to the studies of green transportation technologies nevertheless; major research questions are still open relating to the integrated effect of socio-economic and psychological factors on the consumers' adoption. Prior work has examined specific elements independently, for instance, economic incentives or environmental considerations, and without extending these factors into a behavioural architecture. Also, a dearth of research about the impact of social norms and personal values targeting use and consumer decisions in various demographic and geographic locations. Hence, this research seeks to fill these gaps by offering a systematic overview of the various factors affecting the consumer. Using such a research design, this study will produce rich and detailed understandings of the self, social, and context-level factors that shape the use of sustainable transport options This is important for enhancing the effectiveness of interventions aimed at promoting green transport solutions.

Research Objectives

1. To assess the impact of economic incentives on consumer adoption of green transportation technologies.
2. To explore the relationship between environmental awareness and the adoption of sustainable transportation options.

3. To evaluate the influence of social norms and values on consumer preferences for green transportation.

Conceptual Framework



Source: Primary

Research Hypotheses

H1: Economic factors significantly influence consumers' attitude toward adopting green transportation technologies.
H2: Environmental concerns significantly influence consumers' attitude toward adopting green transportation technologies.
H3: Social factors significantly influence consumers' attitude toward adopting green transportation technologies.
H4: Consumers' attitude toward adoption positively influences their intention to adopt green transportation.
H5: Intention to adopt green transportation technologies positively affects actual adoption behaviour.

RESEARCH METHODOLOGY

This study uses a quantitative research approach to assess the impact and understand the relationship between the environmental, social and economic factors on the consumer adoption to green transportation technologies. Primary data is used in this study were obtained from the questionnaire. Prior to the data collection, reliability and validity test were done. The data were gathered using survey method which consists of two sections, the first section focuses on the demographic variables of the respondents, (age, income level, education, monthly household income, city and owning of green transportation vehicle) and using the Likert five-point scale, the second section assess the attitude towards the adoption of green transportation. Stratified sampling technique was used to select the metropolitan cities in India namely, Bengaluru, Chennai, Hyderabad, Mumbai and Kolkata. Convenience sampling of 103 respondents was used to understand the diverse perception and adoption of green transportation technologies from the selected metropolitan cities. The analysis of this study is carried out using IBM SPSS.

RESULTS AND DISCUSSION

The collected data were analysed using Descriptive analysis, correlation analysis, t test and multiple regression.

Demographic Description

It is acknowledged from Table 1, that the sample covers 97% male respondents and 3% female respondents. Age of the respondents are confessing, that 2% of respondents are under 20 years, 24% are between 21-30 years, majority (64%) of the respondents are in the age group of 31-40 years, 5% are in the age group of 41-50 and 5% are above 50 years. Approximately 41% of the respondents are postgraduates, 21% constitutes undergraduate,

9.7% are HSC, 15.5% are doctorate and remaining 13.6% of the respondents are from other educational backgrounds like, ITI, Polytechnic and uneducated. This study also asserts that 31% of respondents are earning less than 25000 as monthly income, 46% are between 25001-50000, 11.5% are between 50001-1,00,000 and 11.5% are more than 1 lac. The distribution of respondents based on their location are 35.9% of the respondents from Chennai, 37.9% from Bengaluru, 5.8% from Mumbai, 5.8% from Kolkata and 14.6% from Hyderabad respectively. 97% of the respondents own a green vehicle and 3% does not own green vehicle.

Table 1

Socio Demographic Variables	Items	Frequency	Percentage
Gender	Male Female	83 20	97 03
Age	Under 20 21-30 31-40 41-50 Above 50	2 24 65 6 6	02 24 64 05 05
Education level	High school Undergraduate Postgraduate Doctorate Others	10 21 42 16 14	9.7 20.4 40.8 15.5 13.6
Monthly household income	Below ₹25,000 ₹25,001–50,000 ₹50,001–1,00,000 Above ₹1,00,000	32 47 12 12	31 46 11.5 11.5
Current city	Chennai Bengaluru Mumbai Kolkata Hyderabad	37 39 06 06 15	35.9 37.9 5.8 5.8 14.6
Own a green transportation vehicle	Yes No	100 03	97 03

Descriptive Statistics on Attitudinal Variables and its Significance

Table 2 represents the average, standard deviation, t value and its significance on economic, environmental, social norms and values, attitudinal, perceived behavioural control, intention and adoption of green transportation technologies. It is evident from the analysis that all the variables are significant at 5% level of significance.

Table 2

Attitudinal Variables	Mean	SD	T	Significance
Economic factors				
Government subsidies or incentives influence my decision to adopt green transportation.	3.56	1.15	31.39	0.000*
Tax benefits motivate me to consider buying a green vehicle.	4.14	0.79	52.95	0.000*
High upfront costs discourage me from adopting green transportation.	4.13	0.81	51.53	0.000*
I consider the cost of fuel when choosing a transportation option.	4.21	0.74	58.07	0.000*
Environmental awareness				
I am concerned about the impact of transportation on climate change.	4.26	0.61	70.94	0.000*
I actively look for ways to reduce my carbon footprint.	4.37	0.59	74.56	0.000*
I believe green transportation technologies can help protect the environment.	4.42	0.61	74.39	0.000*
Adopting green transportation helps reduce pollution.	4.12	0.78	53.33	0.000*
Social norms and values				
My friends and family support the use of green transportation.	3.81	1.02	37.89	0.000*
I feel social pressure to make environmentally conscious choices.	3.37	1.21	28.37	0.000*

Using green transportation aligns with my personal values.				
I am influenced by what people around me think about green vehicles.	4.11	0.81	51.70	0.000*
	2.41	1.06	23.23	0.000*
Attitude toward adoption				
I have a positive attitude towards green transportation	4.14	0.82	50.63	0.000*
I believe adopting green transportation is beneficial.	3.75	0.73	51.59	0.000*
I am open to changing my current transportation habits.	3.73	0.76	49.49	0.000*
Perceived behavioural control				
I have the resources and ability to use green transportation.	3.75	0.94	40.62	0.000*
It is easy for me to switch to green transportation.				
I feel confident in my ability to adopt green transportation.	3.64	0.83	44.70	0.000*
	3.86	0.91	42.90	0.000*
Intention to adopt				
I intend to purchase a green vehicle in near future.	4.07	0.77	53.35	0.000*
I am likely to use green transportation if it is available.	4.48	0.59	76.79	0.000*
I plan to shift to green transportation technologies soon.	4.02	0.77	52.92	0.000*
Actual adoption behaviour				
I currently use green transportation options regularly.	3.75	0.75	50.68	0.000*
I have made lifestyle changes to accommodate green transportation.	3.82	0.84	45.62	0.000*
I actively seek out green transportation choices.	3.64	0.83	44.69	0.000*

Construct Validity and Reliability

Hair et al (2010) states that the value of construct reliability by Cronbach Alpha is declared good if its value is >=0.6. The result is as follows:

Item	Score of Cronbach Alpha	Result of Reliability Test
Economic factors	0.746	Reliable
Environmental factors	0.629	Reliable
Social factors	0.767	Reliable
Attitude	0.846	Reliable
Perceived behaviour	0.678	Reliable
Intention to adopt	0.623	Reliable
Actual adoption behaviour	0.611	Reliable

All the items are reliable.

Correlation Analysis and its Significance

Table 3 provides the correlation between economic, environmental, social norms and values, attitudinal, perceived behavioural control, intention and adoption of green transportation technologies. Environmental, economic, perceived behavioural control and intention to adopt at significant at 5% level of significance.

Table 3

Correlations								
		Economic	**Environment**	**Social**	**Attitude**	**Perceived Behaviour**	**Intention for Adoption**	**Actual Adoption**
Environment	Pearson Correlation	.199*	1					
	Sig. (2-tailed)	.044						
Social	Pearson Correlation	.107	.133	1				
	Sig. (2-tailed)	.282	.181					
Attitude	Pearson Correlation	-.002	-.142	.174	1			
	Sig. (2-tailed)	.986	.152	.079				
Perceived behaviour	Pearson Correlation	.253**	.303**	-.066	.022	1		
	Sig. (2-tailed)	.010	.002	.509	.825			
Intention to adopt	Pearson Correlation	.253**	.303**	-.066	.022	1.000**	1	.081
	Sig. (2-tailed)	.010	.002	.509	.825	.000		.419
Actual adoption	Pearson Correlation	-.007	.071	-.122	.184	.081	.081	1
	Sig. (2-tailed)	.947	.476	.218	.063	.419	.419	

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

Attitude, Perceived Behaviour and Actual Adoption of Green Transportation Technologies.

Using the paired "t" test, the gap analysis is performed between attitude, perception and adoption of green transportation technologies among the respondents and the results are presented in the below table.

Table 4

Pair	Paired difference			t value	Significance (2-tailed)
	Mean	Standard deviation	Standard error mean		
Attitude- actual adoption	0.41748	1.76859	0.17426	2.396	0.018*
Intention- actual adoption	1.37864	1.76633	0.17404	7.921	0.000*
Perceived behaviour – actual adoption	1.2684	1.7862	0.16573	6.857	0.000*

*significance at 5% level.

It is seen from the above table that all the statements about attitude, intention and perceived behaviour towards the actual adoption of green transportation technologies, there is a significant gap between the perception and adoption at 5% level of significance.

Multiple Regression

To determine the relative effect of economic, environmental, social, intention and attitudinal on actual adoption behaviour, multiple regression was employed. Below table shows the results from regression model. According to the results, the adjusted R-Square is 0.078 for the model indicating the percentage of total variance of actual adoption of green transportation technologies is explained by five predictor variables. The standard error of the estimate (1.376) indicates the average deviation of the observed values from the predicted values.

Table 5. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.274[a]	.075	.078	1.37649
a. Predictors: (Constant), INT_ADP, ATTITUDE, SOCIAL, ECONOMIC, ENVIRON				

Table 6. ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	21.55	5	4.310	4.591	0.012
	Residual	91.083	97	0.939		
	Total	112.633	102			
a. Predictors: (Constant), INT_ADP, ATTITUDE, SOCIAL, ECONOMIC, ENVIRON						
b. Dependent Variable: ACTUAL_ADOP						

The F test shows that the effect of the five independent variables on actual adoption is significant and that provides support for the hypothesis that the relationship between economic, environmental, social, attitudinal, intention and actual adoption.

Table 7. Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	7.771	2.466		3.151	.002
	ECONOMIC	-.014	.074	-.020	-.193	.847
	ENVIRON	.119	.105	.121	1.139	.258
	SOCIAL	-.116	.068	-.174	-1.711	.090

	ATTITUDE	.235	.103	.231	2.283	.025*
	INT_ADP	.038	.123	.032	.305	.761
a. Dependent Variable: ACTUAL_ADOP						

Among the predictors, attitude emerged as the only significant variable (p=0.025), indicating that a more positive consumer attitude toward green transportation technologies is associated with a greater likelihood of actual adoption. The standardized beta value of 0.231 reflects a moderate effect size, highlighting attitude as a key behavioural driver. The economic and environmental variables were not statistically significant, suggesting that cost-related and environmental motivations alone may not be strong determinants of adoption. Interesting, social influence shows marginal effect (p = 0.090), indicating a potential area for further exploration, especially various cultures in India, where peer norms and social approval often influence individual decision making.

The findings reveal that attitudinal factors significantly affect the adoption of green transportation, reinforcing the importance of consumer psychology in environmental transitions. The lack of significance for economic and environmental considerations may indicate that these variables, though important, do not directly translate into behavioural adoption without a positive predisposition or mindset. Given the weak explanatory power of the mode, it is evident that other external factors – such as policy support, infrastructure availability, perceived ease of use, technological accessibility, and trust in green technologies could play a vital role in shaping adoption behaviour.

CONCLUSION

The adoption of green transportation technologies in India is not solely a function of economic cost-benefit analysis or environmental awareness but is deeply rooted in consumers' psychological dispositions, social influences, and perceived behavioural control. This study provides empirical evidence that while consumers acknowledge the environmental importance of green mobility and show a high level of intention, a substantial gap exists between these cognitive evaluations and actual adoption behaviour.

Among all influencing variables, a positive attitude toward green transportation emerged as the most critical determinant of actual adoption. This finding reinforces the theoretical proposition of the Theory of Planned Behaviour, where attitude strongly shapes behavioural intention and subsequent actions. Furthermore, the insignificant impact of economic and environmental factors on actual adoption suggests that these may serve as necessary but insufficient conditions—requiring complementary behavioural enablers, such as trust, convenience, and peer support, to facilitate adoption. The findings also point to a need for further longitudinal research to track behavioural changes over time and across demographic segments. Future studies may also incorporate qualitative approaches to explore deeper emotional and cognitive barriers to adoption. The study offers a comprehensive, evidence-based foundation for advancing green transportation strategies in India, aiming to align consumer behaviour with national and global sustainability objectives.

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