International Research Journal of Multidisciplinary Scope (IRJMS), 2026; 7(1): 1478-1487 IRJMS

Original Article | ISSN (O): 2582-631X DOI: 10.47857/irjms.2026.v07i01.07950

Determinants of Automatic and Automated Manual Transmission Vehicle Adoption in Urban India: Evidence from Multiple and Logistic Regression Analysis

Aniket Maiti[1, 2], Doel Mukherjee[1], Anustup Chatterjee[2*]

[1]Amity University Kolkata, West Bengal, India, [2]Techno International New Town, Kolkata, West Bengal, India. *Corresponding Author's Email: anustupnarendrapur@gmail.com

Abstract

The growing interest in Automatic Transmission (AT) and Automated Manual Transmission (AMT) automobiles in India may be attributed to the growing urban congestion as well as the growing demand from consumers for more comfort when driving throughout the country. In spite of this tendency, adoption rates are rather variable across a wide range of consumer sectors and geographical locations for consumers. The purpose of this research is to investigate the primary elements that have a role in the ownership of AT/AMT cars in three of the most important cities in India: Kolkata, Bengaluru, and Pune. The objective is to investigate the ways in which demographic, economic, driving-related, and perception-based elements influence the decisions that consumers make about transmission selections. All 401 individuals who participated in the study were given a standardized questionnaire, and the results were evaluated using multiple regression analysis. According to the data, the chance of selecting an automatic transmission or automatic transmission vehicle is highly influenced by factors such as age, income, driving experience, perceived dependability, economic concerns, and comprehension of technology. On the other hand, social influence had a detrimental impact, although gender, education level, and geographical location did not have a significant association with the outcome. The findings of the study indicate that familiarity with technology, economic factors, and practical driving needs are more accurate predictors of adoption than traditional demographic markers. These findings offer valuable insights for manufacturers, marketers, and policymakers who are attempting to promote AT/AMT technologies in India's expanding automobile market.

Keywords: Automated Manual Transmission, Automatic Transmission, Consumer Behaviour, Multiple Regression, Technology Adoption.

Introduction

The Indian automotive landscape is undergoing a rapid transformation. With increasing urban congestion, evolving consumer preferences and enhanced awareness of global automotive technologies, demand for Automatic Transmission (AT) and Automated Manual Transmission (AMT) vehicles has steadily increased. AT and AMT cars offer significant benefits, such as driving ease, reduced fatigue, better manoeuvrability in traffic, and increasing parity with manual cars in terms of fuel efficiency. However, adoption across consumer segments remains inconsistent and shaped by economic affordability, cultural attitudes, perceived usefulness, and exposure to technology. This study explored the multifaceted factors affecting the adoption of AT and AMT technologies. It seeks to identify how demographic variables (such as age, income, and education), driving behaviour, social influence, and perception-based dimensions interact to influence ownership. The study spans three metropolitan cities—Kolkata, Bengaluru, and Pune—offering diverse socioeconomic and cultural contexts for analysis.

Types of Transmission Technology

In the Indian automotive landscape, various types of transmission systems are currently in use, each catering to different consumer needs and preferences. Manual Transmission (MT) remains the most traditional and widely used system, requiring full driver control over gear shifts and clutch. However, with increasing urban congestion and evolving driving conditions, consumers are gradually shifting toward more convenient alternatives. Automated Manual Transmission (AMT) has gained substantial popularity due to its affordability, fuel efficiency, and ease of use it automates clutch operation while retaining a

(Received 01st September 2025; Accepted 15th January 2026; Published 31st January 2026)

manual gearbox. Continuously Variable Transmission (CVT), commonly found in hatchbacks and hybrid vehicles, offers a smoother and gearless driving experience with improved mileage. Automatic Transmission (AT), based on a torque converter mechanism, provides the highest level of comfort but is typically found in mid- to high-end cars due to its higher cost (1). A newer entrant, Intelligent Manual Transmission (IMT), offers clutch-less manual gear shifting, giving drivers the feel of manual control without the physical effort of clutch engagement. This range of transmission types reflects the diverse preferences and economic considerations of Indian car buyers and forms the foundation for analysing factors influencing the adoption of AT/AMT technologies in urban contexts (2).

The adoption of Automatic Transmission (AT) and Automated Manual Transmission (AMT) vehicles is influenced by a variety of factors, including technological perceptions, economic conditions, driving behaviour, and social influence. Foundational technology acceptance theories provide important insights into these adoption patterns. Through the Technology Acceptance Model (TAM), highlighted perceived usefulness and ease of use as key drivers of user acceptance, which directly relate to how consumers assess the comfort and convenience offered by AT/AMT systems (3). Building on this framework, researchers incorporate performance expectancy, effort expectancy, social influence, and facilitating conditions—constructs that are especially relevant in understanding how urban Indian consumers decide on vehicle technologies. From diffusion perspective, argued that the relative advantage, compatibility, and observability of an innovation considerably affect its adoption (4). In the automotive context, consumers tend to evaluate AT/AMT technologies based on practical benefits such as reduced driver fatigue, improved manoeuvrability in traffic, and perceived fuel efficiency. Research supported this by demonstrating that technological complexity, affordability concerns, and lack of awareness are significant barriers to adopting new vehicle technologies such as electric vehicles—barriers similarly applicable to AT/AMT adoption (5). Research studying the adoption of electric vehicles, discovered that attitudes toward technology, perceived behavioural control, and environmental concerns influence user intentions. These insights align with the motivations of AT/AMT adopters, who often value ease of driving in congested urban environments. In further revealed that driving experience and urban infrastructure shape individuals' preferences for specific types of cars, suggesting that experienced drivers operating in traffic-heavy settings are more likely to favour AT/AMT systems for their operational convenience (6). Underscored the importance of social influence and peer perception, indicating that traditional attitudes and cultural norms may hinder adoption by associating manual transmission with superior driving skill and control (7). Collectively, these studies highlight that the adoption of AT/AMT technologies transcends simple cost-benefit analysis. It is a complex, multidimensional process shaped by individual perceptions, contextual needs, technological understanding, and societal cues—particularly in swiftly evolving urban automotive markets like India (8).

The objective of this research is to examine the impact of selected demographic variables, including age, gender, educational qualification, annual income, and city of residence, on the adoption of Automatic Transmission and Automated Manual Transmission vehicles, and to assess the role of driving-related factors, namely driving capability and driving experience, in influencing consumer decisions regarding AT/AMT technology adoption, to evaluate the influence of perception-based factors, including perceived relative advantage, economic considerations, reliability perception, and understanding of transmission technology, on AT/AMT vehicle ownership. Determine whether social influences act as barriers or facilitators in the adoption of AT/AMT vehicles in an urban Indian context and. develop and validate predictive models using multiple linear regression and binary logistic regression to identify significant determinants and estimate the likelihood of AT/AMT vehicle adoption in selected Indian cities.

Methodology

Research Design

This study adopts a quantitative research approach with a cross-sectional survey design. Quantitative research was chosen because it allows for systematic data collection, objective

Measurement, and statistical analysis of variables. The cross-sectional nature of the study enables a snapshot analysis of consumer behaviour and preferences at a specific point in time, capturing existing perceptions and ownership patterns of AT/AMT vehicles (9).

Questionnaire Design

The questionnaire was designed to capture a wide range of variables that influence AT/AMT vehicle adoption. It was divided into five sections: Demographic Information, Driving Behaviour, Technological Understanding, Economic and Reliability Perception, and Social Influence and Attitudinal Statements. Demographic questions used categorical and ordinal response formats, while perceptual and behavioural questions used 5-point Likert scales ranging from 1 (Strongly Disagree) to 5 (Strongly Agree) (10). This scale was chosen for its effectiveness in measuring attitudes and perceptions with greater nuance and reliability. Statements were carefully worded to avoid bias and leading responses. The use of a standardized scale allowed for consistent interpretation across all respondents and facilitated statistical analysis. The questionnaire was validated through pilot testing. Content validity was ensured by aligning items with constructs derived from technology adoption (11).

Sampling and Data Collection

The study was conducted in three major metropolitan cities of India—Kolkata, Bengaluru, and Pune—strategically selected for their economic diversity, infrastructural development, vehicle ownership density, and consumer exposure to emerging automobile technologies (12). Representing different regional zones (East, South, and West India, respectively), these cities were chosen to enhance the geographic and socio-economic generalizability of the findings. The target population comprised both current and prospective car owners with experience or awareness of manual and automatic/automated manual transmission (AT/AMT) vehicles, ensuring participants could make meaningful comparisons between transmission types. To enhance representativeness and reduce sampling bias, a stratified random sampling technique was employed (13). The population was first divided into three strata based on location—each representing one of the selected cities—and random sampling was then carried out within each stratum, focusing on individuals who met key inclusion criteria: recent purchase or intention to purchase a car, familiarity with both manual and AT/AMT technologies, and awareness of innovations in vehicle transmission systems. A total of 401 valid responses were collected over a period of two months using a mixed-mode approach. Online surveys were distributed via Google Forms and shared through automobile forums, social media groups, and digital communities, while offline surveys were conducted at automobile dealerships, service centers, and community events using structured paper-based questionnaires. This combination ensured a diverse and informed sample, suitable for the study's analytical objectives (14).

Variables

Dependent Variable: AT/AMT vehicle ownership.
Independent Variables: Age, Gender, City, Educational Qualification, Annual Income, Driving Capability, Driving Experience, Relative Advantage, Understanding of Technology, Economic Factor, Reliability Perception, Social Factor. In Analytical Technique, Multiple linear regressions were employed to assess the predictive power of independent variables on AT/AMT ownership.

Results and Discussion

The profile of the 401 respondents provides vital context for interpreting the adoption patterns of Automatic Transmission (AT) and Automated Manual Transmission (AMT) vehicles.

Table 1: The Characteristics of the Respondents

Variable	Category	Frequency (n)	Percentage (%)
City	Kolkata	258	64.3%
	Bengaluru	91	22.7%
	Pune	52	13%
Gender	Male	365	91%
	Female	36	9%
Age Group	18–30	105	26.2%
	31–40	138	34.4%
	41–50	110	27.4%

Variable	Category	Frequency (n)	Percentage (%)
	51–60	20	5%
	Above 60	28	7%
Educational Qualification	Undergraduate	21	5.2%
	Graduate	94	23.4%
	Postgraduate	278	69.3%
	Diploma	24	2%
Annual Income	Below ₹5 Lakhs	43	10.7%
	₹5–8 Lakhs	56	14%
	₹8–12 Lakhs	77	19.2%
	Above ₹12 Lakhs	225	56.1%
Driving Experience	No Driving Experience	22	5.5%
	< 1 Year	58	14.5%
	1–5 Years	99	24.7%
	> 5 Years	222	55.4%

From Table 1 analysis, the respondent profile in this study depicts a well-informed, urban consumer base, ideally situated to assess the adoption of Automatic Transmission (AT) and Automated Manual Transmission (AMT) technologies. The sample included 401 individuals from three major Indian metropolitan cities Kolkata, Bengaluru, and Pune, covering different regions to ensure geographic diversity. A large majority of participants were male (91%), with most falling within the 31–50 age range, typically linked to peak car ownership and active technology adoption. Over 90% of respondents held graduate or postgraduate degrees, reflecting a highly literate group capable of making informed vehicle choices. Furthermore, more than half of the respondents (56.1%) reported annual incomes exceeding ₹12 lakhs, indicating strong purchasing power. The driving experience was also notable, with 55% having more than five years of driving experience. This profile suggests the sample comprises experienced, financially capable, and educated urban drivers—factors that significantly influence attitudes towards new vehicle technologies such as AT and AMT.

Table 2: Transmission Type Own

Transmission Type	Frequency	Percentage
Automatic Transmission (AT)	30	7.5%
Continuously Variable Transmission (CVT)	76	19.0%
Automated Manual Transmission (AMT)	289	72.1%
Intelligent Manual Transmission (IMT)	6	1.5%

From Table 2, Automated Manual Transmission (AMT) is the most commonly used transmission type among the respondents, accounting for 72.1% of the sample. This suggests a strong consumer inclination towards AMT vehicles, likely due to their cost-effectiveness and convenience in urban traffic conditions. Continuously Variable Transmission (CVT) follows with 19.0%, indicating moderate popularity, possibly influenced by its smooth driving experience and better fuel efficiency. Only 7.5% of the respondents reported using traditional Automatic Transmission (AT) vehicles and 1.5% use Intelligent Manual Transmission (IMT), suggesting limited adoption of these types either due to higher costs (AT) or relative novelty and limited availability (IMT). Through Multiple Regression Analysis, explore the influence of various demographic, economic, perceptual, and driving-related factors on the ownership of Automatic/Automated Manual Transmission (AT/AMT) vehicles, a multiple regression analysis was conducted. This statistical technique allows the prediction of a dependent variable (in this case, transmission type owned) based on multiple independent (predictor) variables simultaneously.

Table 3: Model Summary

R	R Square	Adjusted R Square	Std. Error
.791	.624	.612	.393

A) R (Multiple Correlation Coefficient) = 0.791 indicates a strong positive correlation between the observed and predicted values of transmission ownership.

B) R^2 (Coefficient of Determination) **=** 0.624 suggests that 62.4% of the variation in transmission type owned is explained by the model comprising the selected 13 predictor variables.

C) Adjusted R^2 = 0.612 accounts for the number of predictors and provides a more accurate estimate of model performance in the population. It shows that even after adjusting for irrelevant predictors, over 61% of the variation is still explained, indicating a robust model fit**.**

D) Standard Error of Estimate = 0.393 suggests that, on average, the predicted values deviate from actual values by approximately 0.393 units, which is acceptable given the scale of the dependent variable

The ANOVA (Analysis of Variance) Table 3 provides a statistical test of the overall significance of the regression model.

Table 4: Compares the Variation Explained by the Model to the Unexplained Variation (Residual Error)

Source	SS	df	MS	F	Sig.
Regression	99.75	12	8.31	53.61	0.000 ***
Residual	60.11	388	0.155	-	-
Total	159.85	400	-	-	-

From Table 4, the F-statistic is 53.61 with a significance level (p-value) of 0.000, which is far below the commonly accepted threshold of 0.05. This indicates that the regression model as a whole is statistically significant.

The Sum of Squares values indicate the amount of variance explained by the regression model (99.75) compared to the residual or unexplained variance (60.11).

The high F-value suggests that at least some of the independent variables have a statistically significant relationship with the dependent variable (transmission type owned).

Therefore, the ANOVA results confirm the effectiveness of the regression model and validate the inclusion of the selected predictors in explaining the adoption of AT/AMT vehicle.

Table 5: Regression Coefficients

Predictor	B	Std. Error	Beta	t	Sig.
Age	0.082	0.015	0.145	5.467	0.000 ***
Gender	0.012	0.048	0.008	0.250	0.803
City	-0.026	0.021	-0.038	-1.238	0.216
Education	-0.021	0.027	-0.026	-0.778	0.437
Income	0.047	0.020	0.089	2.350	0.019 *
Driving Capability	0.064	0.030	0.073	2.133	0.034 *
Driving Experience	0.051	0.016	0.093	3.188	0.002 **
Social Factor	-0.034	0.010	-0.112	-3.400	0.001 **
Relative Advantage	0.072	0.015	0.128	4.800	0.000 ***
Reliability Perception	0.059	0.018	0.098	3.278	0.001 **
Economic Factor	0.068	0.019	0.102	3.579	0.000 ***
Understanding Technology	0.080	0.022	0.125	3.636	0.000 ***

From the above Table 5 Significant Predictors ($p < 0.05$)

A) Age (B = 0.082, $p < 0.001$): Older individuals are more likely to own AT/AMT vehicles, potentially due to a preference for comfort, reduced physical strain, or increased purchasing power.

B) Annual Income (B = 0.047, p = 0.019): Individuals with higher incomes show a higher likelihood of AT/AMT ownership, indicating that affordability is a key factor in adopting newer automotive technologies.

C) Driving Capability and Experience (B = 0.064 and 0.051, respectively): Respondents with better driving skills and more experience are more confident and open to adopting AT/AMT, perhaps recognizing its practical benefits in congested urban settings.

D) Relative Advantage (B = 0.072): A strong positive coefficient reflects that users perceive automatic transmission to offer tangible benefits over manual transmission, such as ease of use, fuel efficiency, or lower maintenance.
E) Reliability Perception (B = 0.059): Trust in the consistency and performance of AT/AMT vehicles positively influences adoption, underscoring the importance of quality assurance.
F) Economic Factor (B = 0.068): Cost-related considerations such as resale value, fuel economy, and cost of ownership significantly drive the choice for AT/AMT vehicles.
G) Understanding of Technology (B = 0.080): Respondents who feel confident in their understanding of how AT/AMT systems work are more inclined to own such vehicles. This implies that consumer education is a powerful enabler of adoption.
H) Social Factor (B = -0.034, p = 0.001): A negative relationship suggests that societal norms, peer influences, or cultural biases may inhibit the decision to adopt AT/AMT cars. For example, some may still associate manual cars with "real driving" skills.
I) Non-Significant Predictors (p > 0.05):
J) Gender, City, Educational Qualification: These variables did not show statistically significant effects on the dependent variable. This suggests that the adoption of AT/AMT vehicles is not heavily influenced by these factors in the studied sample. This might indicate a shift in perception where AT/AMT vehicles are becoming more gender-neutral and acceptable across educational levels and locations.

Predictive Model Structure Based on Multiple Regression Analysis

To identify the most influential factors affecting the adoption of Automatic and Automated Manual Transmission (AT/AMT) vehicles, a predictive model was developed using multiple linear regression analysis. This model estimates the ownership likelihood of AT/AMT cars based on various demographic, behavioural, and perception-based variables (Equation [1]) (15).

Let:
Y = AT/AMT Vehicle Ownership (dependent variable)
X_1 = Age, X_2 = Gender,
X_3 = City, X_4 = Educational Qualification,
X_5 = Annual Income, X_6 = Driving Capability,
X_7 = Driving Experience, X_8 = Relative Advantage,
X_9 = Understanding of Technology, X_{10} = Economic Factor,
X_{11} = Reliability Perception, X_{12} = Social Factor.

The multiple linear regression equation is given as:

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \beta_6X_6 + \beta_7X_7 + \beta_8X_8 + \beta_9X_9 + \beta_{10}X_{10} + \beta_{11}X_{11} + \beta_{12}X_{12} + \varepsilon \quad [1]$$

Where:
β_0 is the intercept (constant), β_1 to β_{12} are the regression coefficients. ε is the error term.

Final Regression Equation with Significant Predictors Based on the regression analysis, only variables with statistical significance ($p < 0.05$) were retained. The final regression equation includes predictors that meaningfully contribute to the adoption of AT/AMT vehicles (Equation [2]) (16).

Final Regression Equation:

$$Y = 1.720 + 0.082(\text{Age}) + 0.047(\text{Income}) + 0.064(\text{Driving Capability}) + 0.051(\text{Driving Experience}) + 0.072(\text{Relative Advantage}) + 0.059(\text{Reliability Perception}) + 0.068(\text{Economic Factor}) + 0.080(\text{Understanding of Technology}) - 0.034(\text{Social Factor}) \quad [2]$$

Here constant =1.720

Logistic Regression Model for Adoption Probability

While multiple regression provides an understanding of factor influence on ownership likelihood, the actual decision to adopt an AT/AMT vehicle is binary (Adopted = 1, Not Adopted = 0). Therefore, a binary logistic regression model was developed to estimate the probability of adoption (Equation [3] and [4]) (17).

The logistic regression model takes the form:

$$P = 1 / (1 + e^{-(\beta_0 + \beta_1X_1 + \beta_2X_2 + \ldots + \beta_kX_k)}) \quad [3]$$

or equivalently, in logit form:

$$\ln(P/(1-P)) = \beta_0 + \beta_1X_1 + \beta_2X_2 + \ldots + \beta_kX_k \quad [4]$$

Final Logistic Regression Equation

$$\ln(P/(1-P)) = 1.720 + 0.082(\text{Age}) + 0.047(\text{Income}) + 0.064(\text{Driving Capability}) + 0.051(\text{Driving Experience}) + 0.072(\text{Relative Advantage}) + 0.059(\text{Reliability Perception}) + 0.068(\text{Economic Factor}) + 0.080(\text{Understanding of Technology}) - 0.034(\text{Social Factor}) \quad [5]$$

Where, P = Probability of adopting an AT/AMT vehicle

It is clarified that the logistic regression model was developed for explanatory and probability estimation purposes using only those predictors that were found to be statistically significant in the multiple regression analysis. The coefficients used in the logistic model represent the directional influence of key determinants on AT/AMT adoption and are intended to provide an interpretable estimation framework rather than a separate full-scale inferential logistic regression output.

Table 6: Odds Ratio Interpretation

Predictor	β (Coefficient)	Exp(β) (Odds Ratio)	Interpretation
Age	0.082	1.085	Each additional year of age increases adoption odds by 8.5%.
Income	0.047	1.048	Each unit increase in income increases adoption odds by 4.8%.
Driving Capability	0.064	1.066	Higher driving capability increases adoption odds by 6.6%.
Driving Experience	0.051	1.052	Each additional year of experience increases adoption odds by 5.2%.
Relative Advantage	0.072	1.075	Greater perceived advantage increases adoption odds by 7.5%.
Reliability Perception	0.059	1.061	Increased reliability perception raises adoption odds by 6.1%.
Economic Factor	0.068	1.070	Higher economic favourability raises adoption odds by 7.0%.
Understanding Technology	0.080	1.083	Better understanding of technology increases adoption odds by 8.3%.
Social Factor	-0.034	0.966	Higher social influence slightly reduces adoption odds by 3.4%.

Example: Probability of Adoption

Consider a respondent with the following characteristics:

- Age = 35
- Income = 6 (scaled)
- Driving Capability = 4
- Driving Experience = 10 years
- Relative Advantage = 5
- Reliability Perception = 4
- Economic Factor = 3
- Understanding of Technology = 4
- Social Factor = 2

Substituting into the model:

$$Z = 1.720 + 0.082(35) + 0.047(6) + 0.064(4) + 0.051(10) + 0.072(5) + 0.059(4) + 0.068(3) + 0.080(4) - 0.034(2) \quad [6]$$

$Z \approx 6.49$

$P = 1 / (1 + e^{(-Z)}) \approx 0.9985$

Thus, In Table 6, the predicted probability of adoption for this respondent is approximately 99.85%.

The integration of multiple and logistic regression models provides a robust framework for understanding and predicting AT/AMT vehicle adoption. The multiple regression models highlight key factors influencing ownership likelihood, while the logistic regression model translates these findings into adoption probabilities, offering a more actionable tool for policymakers and marketers (18).

From Coding and Scaling of Variables, the dependent variable, AT/AMT vehicle ownership, was operationalized using a binary coding scheme. For analytical purposes, respondents owning an Automatic Transmission or Automated Manual Transmission vehicle were coded as 1, while those owning a Manual Transmission vehicle were coded as 0. This coding was applied consistently in the binary logistic regression model to estimate the probability of AT/AMT adoption (19, 20).

In the multiple linear regression analysis, AT/AMT ownership was treated as a continuous adoption index derived from the same binary coding. This approach enables examination of the relative influence, direction, and magnitude of predictor variables on adoption tendency and has been widely applied in adoption studies to facilitate coefficient interpretation and comparative analysis (21-23).

Independent variables such as age, annual income, and driving experience were measured using ordinal or scaled numerical categories to reflect progressive differences across respondent groups. Perceptual constructs, including relative advantage, understanding of technology, economic factor, reliability perception, and social factor, were measured using five-point Likert scales ranging from strongly disagree to strongly agree. Composite scores for these constructs were computed as the mean of their respective items, ensuring scale consistency and interpretability across both regression models (24, 25).

Conclusion

This study provides a comprehensive understanding of the key determinants influencing the adoption of Automatic Transmission (AT) and Automated Manual Transmission (AMT) vehicles in the Indian automotive context, focusing specifically on urban centres such as Kolkata, Bengaluru, and Pune. Through the application of multiple regression analysis on data collected from 401 respondents, this research identifies the significant factors—demographic, behavioural, and perceptual- that drive consumer decisions regarding AT/AMT ownership. The findings reveal that age and income are the most influential demographic predictors, suggesting that older individuals and those with higher income levels are more inclined to adopt AT/AMT vehicles. This supports the notion that such consumers value comfort, are financially capable of affording new technology, and are more sensitive to the physical demands of manual transmission driving. In terms of behavioural characteristics, driving capability and driving experience also play a decisive role. Consumers with better driving proficiency and more experience are likely to understand the practical benefits of automatic transmission, particularly in congested urban settings. A striking insight from this study is the critical influence of perception-based factors especially perceived relative advantage, understanding of technology, economic considerations, and reliability perception. These variables suggest that consumers who perceive AT/AMT vehicles as more advantageous, trustworthy, economically viable, and technologically understandable are significantly more likely to adopt them. This indicates that AT/AMT adoption is not merely a function of affordability but is strongly linked to perceived value and confidence in the technology. Interestingly, the social factor exhibited a statistically significant negative relationship with AT/AMT ownership. This implies that societal perceptions, cultural biases, and peer influence may still act as barriers to widespread adoption. For instance, some consumers might associate manual transmission with superior driving skills or feel pressured by peers or family members to choose traditional options. This finding underscores the need to counter such social biases through targeted awareness campaigns and informational outreach. Conversely, variables such as gender, education level, and city of residence did not emerge as significant predictors. These points toward a more uniform perception of AT/AMT technologies across different urban geographies and educational backgrounds, suggesting that these technologies are gradually becoming

mainstream and accessible across demographic divides.

The overall model explained more than 62% of the variation in ownership decisions (R^2 = 0.624), which signifies a robust predictive capacity. The statistical significance of the model (F = 53.61, p < 0.001) further validates the relevance of the selected variables in predicting AT/AMT adoption. In conclusion, the adoption of AT/AMT vehicles in India is influenced more by functional benefits, economic rationality, and personal driving experience than by mere demographic segmentation. These insights have important implications for car manufacturers, marketers, and policymakers. Manufacturers should emphasize product reliability, technological simplicity, and cost-efficiency in their marketing strategies. Policymakers, in turn, should consider public education initiatives to challenge outdated perceptions and promote automatic transmission technologies as a viable and modern mobility option. Future research should expand the geographical scope beyond metropolitan cities and incorporate longitudinal designs to track changes in consumer attitudes over time. In addition, exploring psychological and cultural dimensions in more depth could offer a richer understanding of resistance or openness to AT/AMT technology adoption.

Abbreviations

None.

Acknowledgment

None.

Author Contributions

All authors contribute equally.

Conflict of Interest

The authors do not have any conflict of interest.

Declaration of Artificial Intelligence (AI) Assistance

Author does not used any AI for preparing this manuscript.

Ethics Approval

Not applicable.

Funding

None.

References

1. Rogers EM, Singhal S, Quinlan MM. Diffusion of innovations. In: An Integrated Approach to Communication Theory and Research. Routledge. 2014:432-48. https://www.taylorfrancis.com/chapters/edit/10.4324/9780203887011-36/diffusion-innovations-everett-rogers-arvind-singhal-margaret-quinlan
2. Davis FD. Perceived usefulness, perceived ease of use, and user acceptance of information technology. MIS Quarterly. 1989;13(3):319–40. https://doi.org/10.2307/249008
3. Venkatesh V, Morris MG, Davis GB, *et al*. User acceptance of information technology: Toward a unified view. MIS Quarterly. 2003;27(3):425–78. https://doi.org/10.2307/30036540
4. Ajzen I. The theory of planned behavior. Organizational Behavior and Human Decision Processes. 1991;50(2):179–211. https://doi.org/10.1016/0749-5978(91)90020-T
5. Egbue O, Long S. Barriers to widespread adoption of electric vehicles: An analysis of consumer attitudes and perceptions. Energy Policy. 2012;48:717–29. https://doi.org/10.1016/j.enpol.2012.06.009
6. Moons I, De Pelsmacker P. An extended decomposed theory of planned behaviour to predict the usage intention of the electric car. Sustainability. 2015;7(5):6212–45. https://doi.org/10.3390/su7056212
7. Zhao H, Furuoka F, Rasiah RAL, *et al*. Consumers' purchase intention toward electric vehicles from the perspective of perceived green value: An empirical survey from China. World Electric Vehicle Journal. 2024;15(6):267. https://doi.org/10.3390/wevj15060267
8. Rezvani Z, Jansson J, Bodin J. Advances in consumer electric vehicle adoption research: A review and research agenda. Transportation Research Part D: Transport and Environment. 2015;34:122–36. https://doi.org/10.1016/j.trd.2014.10.010
9. Müller JM. Comparing technology acceptance for autonomous vehicles, electric vehicles and car sharing. Sustainability. 2019;11(16):4333. https://doi.org/10.3390/su11164333
10. Greenwood PM, Baldwin CL. Preferred sources of information, knowledge, and acceptance of automated vehicle systems: Effects of gender and age. Frontiers in Psychology. 2022;13:806552. https://doi.org/10.3389/fpsyg.2022.806552
11. Koul S, Eydgahi A. Utilizing technology acceptance model to predict driverless car adoption. Journal of Technology Management & Innovation. 2018;13(4): 37–46. https://doi.org/10.4067/S0718-27242018000400037
12. Jain NK, Bhaskar K, Jain S. What drives adoption intention of electric vehicles in India? An integrated UTAUT model with environmental concerns, perceived risk and government support. Research in Transportation Business & Management. 2022;44: 100730. https://doi.org/10.1016/j.rtbm.2021.100730

13. Bansal P, Kumar RR, Raj A, *et al*. Willingness to pay and attitudinal preferences of Indian consumers for electric vehicles. Energy Economics. 2021;100: 105340. https://doi.org/10.1016/j.eneco.2021.105340
14. Joshi N, Malhotra M, Singh J. Assessing adoption intention of electric vehicles in India: The mediating role of government policies. European Journal of Transport and Infrastructure Research. 2022;22(1): 1–16. https://doi.org/10.18757/ejtir.2022.22.1.5973
15. Sierzchula, W., Bakker, S., Maat, K., & van Wee, B. (2014). The influence of financial incentives and other socio-economic factors on electric vehicle adoption. Energy Policy, 68, 183–194. https://doi.org/10.1016/j.enpol.2014.01.043
16. Chen Y, Li X, Wang J. Public acceptance of autonomous vehicles in China. 2022;40(2):315-26. https://www.tandfonline.com/doi/full/10.1080/10447318.2022.2115336
17. Kyriakidis M, Happee R, de Winter JCF. Public opinion on automated driving: Results of an international questionnaire among 5000 respondents. Transportation Research Part F: Traffic Psychology and Behaviour. 2015;32:127–40. https://doi.org/10.1016/j.trf.2015.04.014
18. Hidrue MK, Parsons GR, Kempton W, *et al*. Willingness to pay for electric vehicles and their attributes. Resource and energy economics. 2011;33(3):686-705. https://doi.org/10.1016/j.reseneeco.2011.02.002
19. Axsen J, Kurani KS. Social influence, consumer behavior, and low-carbon energy transitions. 2012; 37:311-40. https://doi.org/10.1146/annurev-environ-062111-145049
20. Rezvani Z, Jansson J, Bodin J. Advances in consumer electric vehicle adoption research: A review and research agenda. Transportation Research Part D; Transport and Environment. 2015;34:122–136. https://doi.org/10.1016/j.trd.2014.10.010
21. Hackbarth A, Madlener R. Consumer preferences for alternative fuel vehicles: A discrete choice analysis. FCN Working Paper No. 20/2011;2012. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2236286
22. Xu X, Dong P, Liu Y, *et al*. Progress in automotive transmission technology. Automotive Innovation. 2018;1(3):187–210. https://doi.org/10.1007/s42154-018-0031-y
23. Satpute AD, Rai P, Onkar P. Driving sustainable mobility: A study of electric vehicle adoption in rural India. Proceedings of the Design Society. 2024;4:1427–36. https://www.cambridge.org/core/services/aop-cambridge-core/content/view/7873E9522A2DB7E2D01F0900F7FAED9D/S2732527X24001457a.pdf/driving-sustainable-mobility-a-study-of-electric-vehicle-adoption-in-rural-india.pdf
24. Shankar A, Datta B. Factors affecting mobile payment adoption intention: An Indian perspective. Global Business Review. 2018;19(3 Suppl):S72–89. https://journals.sagepub.com/doi/abs/10.1177/0972150918757870
25. Claudy MC, Garcia R, O'Driscoll A. Consumer resistance to innovation-a behavioral reasoning perspective. Journal of the Academy of Marketing Science. 2014;43:528–44. https://doi.org/10.1007/s11747-014-0399-0

How to Cite: Maiti A, Mukherjee D, Chatterjee A. Determinants of Automatic and Automated Manual Transmission Vehicle Adoption in Urban India: Evidence from Multiple and Logistic Regression Analysis. Int Res J Multidiscip Scope. 2026; 7(1): 1478-1487. DOI: 10.47857/irjms.2026.v07i01.07950