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# The Impact Of Intention And Use Behavior On Public Transport Adoption

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**Abstract**
The city is contingent upon the efficacy of its public transportation framework for optimal operational functionality. To harness the full spectrum of its advantages, an in-depth understanding of user adoption trends is imperative. This study investigates the factors influencing user adoption through the lens of the Theory of Planned Behaviour (TPB). The empirical data amassed facilitates a comprehensive examination of socio-economic variables, preferred modes of public transit, and their interrelations with constructs derived from the TPB. Utilizing Confirmatory Factor Analysis (CFA) and Structural Equation Modeling (SEM), the research identifies the predominant determinants that influence public transport utilization and user intentions. The findings underscore the significant influence of attitude, perceived behavioural control, and behavioural intentions in augmenting public transportation usage in Mumbai, while indicating that subjective norms exert a negligible effect. This intelligence provides policymakers and stakeholders with critical insights necessary for formulating targeted strategies to enhance the appeal and operational efficiency of public transit systems. Such initiatives bear the potential to foster a more extensive and environmentally sustainable urban transport infrastructure in analogous cities nationwide.

**Keywords**
Public Transit, User Behaviour, Urban Transport, Theory of Planned Behaviour, CFA, SEM

## Introduction

Public transportation has constituted an indispensable component of urban mobility for over a century, transitioning from basic horse-drawn carriages to sophisticated high-speed rail systems. This evolution is indicative of the escalating demands and intricacies associated with contemporary urban life. The integration of public transportation systems is of paramount importance within urban planning and societal advancement, yielding multifarious advantages that extend beyond the mere facilitation of mobility and are intricately woven into economic, environmental, and social frameworks. Economically, public transportation serves as a crucial catalyst for growth by enhancing urban accessibility, optimizing workforce relocation, and alleviating traffic congestion, which in turn minimizes the substantial economic burdens linked to delays and fuel expenditures. Environmentally, public transportation plays a vital role in addressing climate change and fostering sustainability through a significant reduction in pollution levels. The adoption of public transport on a societal level augments equity and inclusivity by ensuring reliable and affordable mobility options for individuals across various socioeconomic backgrounds, thereby bridging demographic divides and enhancing social cohesion (Chen & Chao, 2011; Jen et al., 2011). To fully capitalize on these multifaceted benefits and to advocate for the broader utilization of public transportation, it is imperative to comprehend the specific determinants that influence its adoption.

The engagement with public transportation is profoundly influenced by factors such as the frequency of service, duration of waiting periods, geographical reach, and the pedestrian distance from an individual's residence or workplace (Bordagaray et al., 2014; Donald et al., 2014; Mouwen, 2015; Sumaedi et al., 2016). A thorough comprehension of these variables that shape individuals' choices to adopt and reliably utilize public transit is essential for fostering its broader implementation and achieving the concomitant advantages (Friman et al., 2001). An examination of various studies employing the Theory of Planned Behavior (TPB) to investigate public transportation adoption provides several important revelations. Golob (2003) noted that over 50 studies have employed Structural Equation Modelling (SEM) to analyse the travel behaviours of users. The SEM approach has been utilized to assess customer satisfaction and loyalty pertaining to public transport services. The interplay between land use and transportation was explored in research by Van Acker et al. (2007) and Abreu e Silva and Goulias (2009). Ngatia et al. (2010) concentrated on the attributes that affect overall passenger satisfaction in public transport services. A comprehensive survey of public transport users in Nairobi proposed a structural equation model to elucidate the relationships between observed and unobserved variables and their effects on overall commuter satisfaction. Sezhian et al. (2011) emphasized evaluating customer expectations regarding public transport. Research conducted by Govender, K. K. (2014) indicates that the quality of service significantly impacts user satisfaction and the quality of public transport services in South Africa.

Bamberg et al. (2007) articulated a robust connection between personal norm (PN) and public transportation utilization, identifying it as a significant predictor alongside subjective norm (SN), perceived behavioral control (PBC), descriptive norm (DN), and attitude. Eriksson and Forward (2011) explored an elaborated framework of the Theory of Planned Behavior (TPB), incorporating a distinct descriptive norm (DN), and determined that attitude (ATT), subjective norm (SN), perceived behavioral control (PBC), and DN had a substantial impact on individuals' intentions to utilize bus services. Donald et al. (2014) substantiated that ATT, SN, and PBC were critical determinants of public transport utilization, introducing additional variables such as moral norms (MN), DN, and environmental concern (EC). Zhang et al. (2016) underscored the prominence of personal norm (PN) and SN as pivotal elements in the decision-making processes regarding public transport usage. Zailani et al. (2016) advanced an expanded TPB framework, elucidating the vital roles of attitude, SN, PBC, and previous behavior as predictors of public transport adoption. The investigation by Ambak et al. (2016), encompassing the title 'Behavioural Intention to Use Public Transport Based on Theory of Planned Behaviour,' delved into the behavioral intentions pertaining to public transport, specifically bus services. Research conducted by Fu and Juan (2017a) identified attitude, subjective norms, satisfaction, and habitual behaviours as key predictors influencing modal choice behavior. The inquiries led by Friman, Lättman, and Olsson (2020) accentuated the critical nature of service quality, accessibility, and user-friendliness in fostering affirmative perceptions and encouraging public transport adoption. De Oña's (2020) examination elucidated the considerable impact of service quality on user satisfaction, which subsequently influences behavioral intentions. Study by Ismael and Duleba (2021) acknowledged the importance of attitudes in shaping user decisions, scrutinizing how individuals' beliefs regarding public transportation and the value ascribed to these beliefs shape overall attitudes. Positive attitudinal dispositions are anticipated to catalyse a heightened intention to opt for public transportation. Ng, P. Y., & Phung, P. T. (2021), employed an Integrative Model of Behavioural Intention to investigate the factors that influence resident's intentions to use public transportation. It reported that the impact of social norms reduces when they are used in an integrative model based on service satisfaction and environmental concerns. Widjaja et al. (2023) delineated the significance of positive attitudes towards public transportation, emphasizing factors such as convenience, cost-effectiveness, and environmental consciousness and further demonstrated the role of social norms, with both descriptive and personal norms contributing to the shaping of user intentions. The research conducted by Gopi et al. (2024) focused on identifications and assessments of factors influencing the sustainable adoption and extensive utilization of electric buses within the framework of Indian public transport systems.

An exhaustive literature review on the application of TPB for modeling public transportation usage reveals a significant research gap where behavioural intentions to use public transportation have not been examined within the Mumbai context, particularly through the TPB lens. Despite the extensive application of TPB in studying travel behaviour (Bamberg et al., 2007; Fu & Juan, 2017; Ng & Phung, 2021; Zailani et al., 2016), no prior research has investigated the influence of attitude, perceived behavioural control, and subjective norms on public transport adoption in Mumbai. To bridge this gap, this research aims to elucidate how these factors impact usage behaviour through Structural Equation Modeling (SEM). This study is pioneering in assessing the factors affecting public transportation adoption from the users' perspective.

**Methodology**

The research employed a primary data methodology to obtain more profound insights into the behaviours associated with public transportation adoption. The study revolved around the collection of primary data using a detailed structured questionnaire. It ensured a representative sample of Mumbai's population through systematic convenience sampling. A pilot study was initially conducted with 175 responses to ensure the reliability and clarity of the questionnaire. Based on the findings from the pilot study, the questionnaire was refined and then a total of 504 respondents was obtained. The questionnaire gathered data on the socio-economic demographics of the respondents and used a 5-point Likert scale for public transport adoption items. The questionnaire items were aligned with the core constructs of the Theory of Planned

Behavior (TPB) model that ensured the data collected was highly relevant to the study's objectives. The descriptive statistics provided an initial understanding of the collected data, summarizing the characteristics of respondents and their public transportation usage. Confirmatory Factor Analysis was employed to validate whether the observed variables effectively captured the underlying TPB constructs. Structural Equation Modeling examined the exploration of the relationships between TPB constructs and their impact on public transportation adoption behavior. The Friedman test, a non-parametric statistical technique, was used to assess the significance of individual items within each TPB construct. This methodology facilitated an extensive analysis of the factors affecting public transportation adoption, thereby enhancing credibility and reliability of the research findings.

**Conceptual Framework: Theory of Planned Behaviour**

The Theory of Planned Behaviour (TPB), as proposed by Ajzen (1991), presents a framework for evaluating the determinants of human behaviour. Within this model, an individual's behavioural intentions are identified as the most significant predictors of specific actions. The TPB comprises five core constructs: Attitude, Subjective Norm, Perceived Behavioural Control, Intention, and Use Behaviour. 'Attitude' pertains to an individual's overall evaluation of a behaviour, which is shaped by beliefs regarding the outcomes of that behaviour and the relative importance ascribed to those outcomes. This construct assesses whether individuals possess favourable or unfavourable attitudes toward public transportation, evaluating it as convenient, economical, environmentally sustainable, or otherwise. 'Subjective Norms' reflect perceived social pressures related to engaging in a particular behaviour. For instance, if individuals observe that their social circle actively utilizes public transportation or that such use is expected, they are likely to develop more favourable behaviours and stronger intentions to adopt public transit. 'Perceived Behavioural Control' relates to an individual's belief in their capacity to execute the behaviour, considering both internal and external factors, including the perceived ease of access to transportation, service frequency, and the integration with alternative modes of transport, as noted by Sheeran (2002) and further analysed by Friman et al. (2020). The behavioural intention captures motivational factors which might influence behaviour of respondents. It usually refers to the actual performance of target behaviour and the actual utilization of public transit facility by individuals.

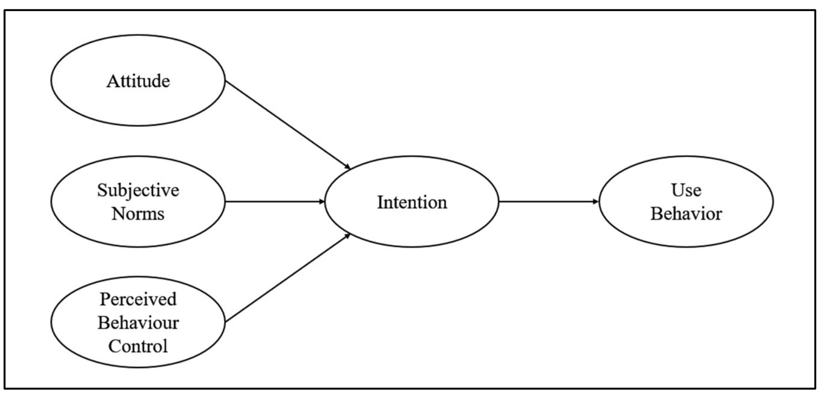


Fig.1.: Theory of Planned Behaviour ModelThe TPB framework hypothesizes a network of relationships between the five constructs. The most important relationships are those that connect attitude, subjective norms, perceived behavioural control to behavioural intention. These constructs have a direct impact on the behavioural intention and another significant relationship is between behavioural intention and use behaviour. The behavioural intention serves as a strong predictor of use behaviour *Sheeran, (2002)*. The interrelationships between these TPB constructs gain a deeper understanding of the factors which influence user decisions to use public transport facilities. The theory of planned behaviour is one of the most applied theories in the social and behavioural sciences to understand and predict behaviours. In the context of research on the adoption of public transportation it is crucial to carefully consider the criteria for modelling behaviour. The *Table 1*. includes a comparative analysis of various research studies that employed an extended TPB model. It emerges as an appropriate and powerful tool for understanding the psychological and social determinants of public transportation adoption *Chen & Chao (2011); Fu & Juan (2017b); Huang et al. (2013); Yuda Bakti et al. (2020)*. The TPB model highlights key factors that help policymakers address barriers and promote positive attitudes toward public transportation, contributing to sustainable urban transportation development.

A structural model was developed using the factor analysis results. SEM is a commonly employed technique for analysing multiple variables to investigate travel behaviours. It enables researchers to test multiple hypotheses within a single structural model. The CFA analysis was conducted using IBM SPSS AMOS and SEM analysis was conducted using Smart PLS. The SEM offers several advantages over traditional regression analysis, by allowing the incorporation of both observable and unobservable variables. The initial step involved creating measurement models and verifying the correlations between observable and latent variables. After that, the measurement models were combined to form the structural model. A structural model is a path diagram that illustrates measurement and structural equations. The intention variable acts as a mediator to explain the indirect influence of attitudes, SN, PBC, and other variables on public transport behaviour.

The structural model was created to evaluate the following null and alternate hypotheses:

1. $H_0$: There is no significant relationship between attitude and behavioural intention to use public transport.
   $H_1$: There is a significant relationship between attitude and behavioural intention to use public transport.
2. $H_0$: There is no significant relationship between subjective norms & behavioural intention to use public transport.
   $H_1$: There is a significant relationship between subjective norms & behavioural intention to use public transport.
3. $H_0$: There is no significant relationship between perceived behavioural control and behavioural intention to use public transport.
   $H_1$: There is a significant relationship between perceived behavioural control and behavioural intention to use public transport.
4. $H_0$: There is no significant relationship between behavioural intention and actual use of public transport.
   $H_1$: There is a significant relationship between behavioural intention and actual use of public transport.

**Data Analysis:**

**Socio-Economic Demographics of the respondents**

In the process of analysis of primary data, the respondents are classified according to socio-economic demographics, The summary of the respondents is shown in *Table 2.* The analysis of the socio-economic demographics of 504 respondents reveals a diverse group. It includes a balanced representation of genders, primarily young individuals aged 15-25 years, a significant number of students, and a substantial urban residency. Employment status varied, with notable groups in service, business, and retirement. Annual family income was evenly distributed across different brackets, and many individuals had attained graduate and postgraduate education levels. The primary modes of transport included local trains, buses, and taxis/cabs. These insights are crucial for developing targeted interventions to enhance public transportation services.

**Table 2.**
Socio-Economic Demographics of the respondents**.**

| Variable | Category | Frequency (%) | Variable | Category | Frequency (%) |
|---|---|---|---|---|---|
| Gender | Female | 227 (45.0) | Annual Family Income (In Rs.) | Up to 4 lakhs | 159 (31.5) |
| | Male | 277 (55.0) | | 4 - 8 lakhs | 105 (20.8) |
| Age (In years) | 15 to 25 years | 216 (42.9) | | 8 - 12 lakhs | 116 (23.0) |
| | 25 - 35 years | 68 (13.5) | | More 12 lakhs | 124 (24.6) |
| | 35 - 45 years | 58 (11.5) | Marital Status | Unmarried | 248 (49.2) |
| | 45 - 55 years | 68 (13.5) | | Married | 194 (38.5) |
| | Above 55 years | 94 (18.7) | | Others | 62 (12.3) |
| Employment Status | Student | 200 (39.7) | Area of Residence | Rural | 56 (11.1) |
| | Service | 97 (19.2) | | Sub-urban | 200 (39.7) |
| | Business | 79 (15.7) | | Urban | 248 (49.2) |
| | Retired | 79 (15.7) | Mode of transport | Buses | 78 (15.5) |
| | Homemaker | 49 (9.7) | | Local Train | 197 (39.1) |
| Education | 10th Pass | 23 (4.6) | | Mumbai Metro | 67 (13.3) |
| | 12th Pass | 74 (14.7) | | Rikshaw | 57 (11.3) |
| | Graduation | 210 (41.7) | | Taxi/Cab | 91 (18.1) |
| | Post Graduation | 152 (30.2) | | Others | 14 (2.8) |
| | PhD | 45 (8.9) | | | |

**Exploratory Factor Analysis**

An explanatory factor analysis was conducted to confirm the association of observed variables with their corresponding latent variables within the framework of the TPB model. The reliability of the factors was checked using Cronbach's alpha value (*Table 3)*. The estimated values of Cronbach's alpha for all of the factors are more than 0.7 which shows an acceptable level of reliability of factors and internal consistency among the respondents in the evaluation of observed variables. The KMO and Bartlett's test was done in factor analysis. The estimated value of KMO greater than 0.7 indicates that there are suitable items for each factor and sample is adequate *(Table 4).* The p-value obtained from Bartlett's test is 0.00, which concludes that the observed variables are suitable for further analysis.

**Table 3.**
Exploratory Factor Analysis Results

| **Factor** | **Indicator** | **Corresponding Statements** | **Cronbach's α-value** |
|---|---|---|---|
| Attitude (ATT) | ATT-1 | Public transportation is a convenient way to travel within the city. | 0.805 |
| | ATT-2 | Travelling in the public transportation system is a reliable and consistent experience. | |
| | ATT-3 | Compared to others, using public transportation is cost-effective and affordable. | |
| | ATT-4 | I feel safe and secure using public transportation even during peak hours. | |
| | ATT-5 | Helps to reduce traffic congestion and pollution in the city. | |
| Subjective Norms (SN) | SN-1 | Most of my friends and family members encourage using public transportation. | 0.854 |
| | SN-2 | I feel my peers or colleagues influence me to use public transportation. | |
| | SN-3 | If more people use it, I would be more inclined to use it as well. | |
| | SN-4 | My social circle generally views using public transportation as a sustainable choice. | |
| | SN-5 | I chose to use public transportation because it lowers my travel costs. | |
| Perceived Behavioural Control (PBC) | PBC-1 | I find it easy to access public transportation, such as bus stops and train stations, near my home or workplace. | 0.862 |
| | PBC-2 | Understanding and navigating routes and schedules is straightforward for me. | |
| | PBC-3 | I feel confident managing crowded situations, even during rush hours. | |
| | PBC-4 | Purchasing tickets or passes for public transportation is a quick and hassle-free process. | |
| | PBC-5 | I believe that longer wait times for public transportation make it difficult to use. | |
| Intention (INT) | INT-1 | I plan to use public transportation as my primary mode of transportation in the next few months. | 0.856 |
| | INT-2 | I am confident I can overcome any challenges or inconveniences associated with using public transportation. | |
| | INT-3 | I intend to use public transportation consistently for my regular travel needs. | |
| | INT-4 | I anticipate using public transportation more frequently than other transportation options available to me. | |
| | INT-5 | I am committed to using public transportation whenever feasible and convenient. | |
| Use Behaviour (UB) | UB-1 | I feel inclined to use public transport more frequently when there is an improvement in service frequency. | 0.846 |
| | UB-2 | I feel motivated to use public transport more often when there is a reduction in travel costs. | |
| | UB-3 | I feel encouraged to use public transport more regularly when there are incentives from the government. | |
| | UB-4 | I feel inclined to use public transport more frequently when there is a reduction in travel time. | |
| | UB-5 | I feel more inclined to use public transport when I have direct access to my workplace and residence. | |

**Table 4.**

| KMO and Bartlett test **Kaiser-Meyer-Olkin Measure of Sampling Adequacy** | | 0.889 |
|---|---|---|
| **Bartlett's Test of Sphericity** | Approx. Chi-Square | 5724.136 |
| | df | 300 |
| | p-value | 0.000 |

**Measurement Model and Confirmatory Factor Analysis (CFA)**

The measurement model defines the relationships between observed indicators and latent constructs. Each construct is measured by five indicators and each indicator has an associated error term. The double-headed arrows between the latent constructs represent covariances among them. It provides a framework and metrics for assessing how well the measured variables represent the underlying theoretical constructs. The initial factor loadings for items ATT5 (0.46) and SN2 (0.63) are below the desired threshold. Those items were removed to address this issue, the CFA was rerun, and a revised measurement model was obtained as shown in *Fig.2*.

After gaining an understanding of the prevailing trends of the data, Confirmatory Factor Analysis was employed to validate the measurement model. CFA is a robust statistical technique that evaluates the alignment between observed data and the theoretical constructs proposed by the TPB framework. This analysis ensured that the survey items accurately captured the underlying latent constructs, which enabled an examination of the measurement model's fit to the observed data. The validation process improves the quality and dependability of the subsequent SEM analysis to gain a deeper understanding of the factors influencing public transportation adoption.

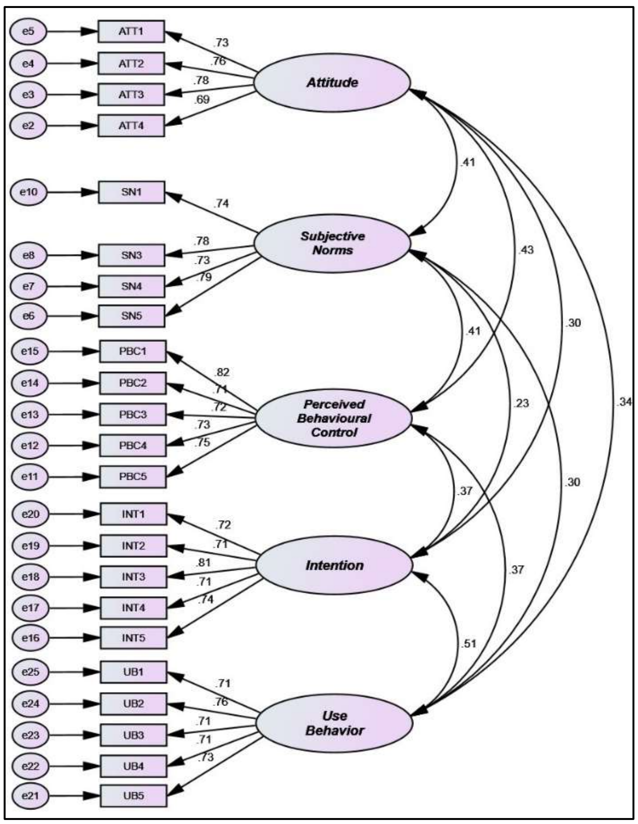


Fig.2. CFA Measurement Model

The estimation for CFA was done and factor loadings were obtained. The factor loadings provide a measure of how well each observed variable captures its intended underlying latent construct. Higher factor loadings indicate a stronger relationship. The values of 0.700 or higher are typically considered good, which indicates an effective measurement of the intended construct *(Taber, 2018)*. The loadings for each item in the TPB model, as well as the AVE and CR, which are two measures used to assess construct validity and reliability, are presented in *Table 5.* for measurement purposes. The Average Variance Extracted (AVE) measures how well items represent their underlying concept. An AVE of 0.5 or higher suggests good validity which implies items effectively capture the intended construct. Composite Reliability (CR) assesses the internal consistency of items within a construct. A CR above 0.7 indicates the items measure the same construct consistently. Discriminant validity was applied to ensure that the constructs truly measure distinct concepts, using the Heterotrait-Monotrait (HTMT) Ratio. If the HTMT ratio is less than value of 0.9 then the constructs are well-discriminated *(Henseler, Ringle, & Sarstedt, 2015)*. *Table 6.* indicates that all HTMT ratios are below the threshold of 0.9, which good discriminant validity among the constructs. The low HTMT ratios indicate that the constructs are distinct from each other, which implies that the indicators are more closely aligned with their respective constructs than with other constructs.

**Table 5.**
Results of factor loadings, composite reliability, and average variance extracted of the model

| Model Constructs | Items | Factor Loadings | AVE | CR |
|---|---|---|---|---|
| Attitude (ATT) | ATT-1 | 0.733 | 0.662 | 0.887 |
| | ATT-2 | 0.765 | | |
| | ATT-3 | 0.783 | | |
| | ATT-4 | 0.689 | | |
| Subjective Norms (SN) | SN-1 | 0.739 | 0.635 | 0.897 |
| | SN-3 | 0.782 | | |
| | SN-4 | 0.732 | | |
| | SN-5 | 0.792 | | |
| Perceived Behavioural Control (PBC) | PBC-1 | 0.821 | 0.643 | 0.900 |
| | PBC-2 | 0.710 | | |
| | PBC-3 | 0.724 | | |
| | PBC-4 | 0.727 | | |
| | PBC-5 | 0.747 | | |
| Intention (INT) | INT-1 | 0.722 | 0.676 | 0.893 |
| | INT-2 | 0.709 | | |
| | INT-3 | 0.805 | | |
| | INT-4 | 0.713 | | |
| | INT-5 | 0.743 | | |
| Use Behaviour (UB) | UB-1 | 0.711 | 0.620 | 0.891 |
| | UB-2 | 0.762 | | |
| | UB-3 | 0.713 | | |
| | UB-4 | 0.709 | | |
| | UB-5 | 0.731 | | |

**Table 6.**
Heterotrait-Monotrait (HTMT) Ratio

| | ATT | SN | PBC | INT | UB |
|---|---|---|---|---|---|
| **ATT** | - | | | | |
| **SN** | 0.294 | - | | | |
| **PBC** | 0.443 | 0.373 | - | | |
| **INT** | 0.411 | 0.228 | 0.410 | - | |
| **UB** | 0.340 | 0.506 | 0.368 | 0.294 | - |

**Model Fit Indices**

The model fit indices are a set of statistical measures which are used to assess the fit of the data. The model fit indices presented in *Table 7*. are of three categories: absolute fit, incremental fit, and parsimonious fit. Absolute fit indices measure how well the model fits the data without making any comparisons to other models. Incremental fit indices compare the fit of the model to the fit of a baseline model. Parsimonious fit indices consider the number of parameters in the model when assessing model fit. The following *Table 7.* presents the model fit indices of CFA. All the fit indices presented in the table are within acceptable ranges, which indicates that the model fits the data well. The results of the confirmatory factor analysis (CFA) for the TPB model indicate that the model is a valid and reliable instrument for measuring the factors that influence public transportation adoption. This implies that the TPB model can be used to reliably measure the factors that influence public transportation.

**Table 7.**
Model Fit Indices

| Name of category | Index | Estimate | Level of Acceptance | Conclusion |
|---|---|---|---|---|
| Absolute Fit | SRMR | 0.057 | SRMR < 0.08 *(Hu & Bentler,1999)* | Excellent |
| | RMSEA | 0.049 | RMSEA < 0.08 *(Hair et al. 2006)* | Excellent |
| | GFI | 0.921 | GFI > 0.90 *(Tanaka and Huba,1985)* | Excellent |
| Incremental Fit | CFI | 0.949 | CFI > 0.90 (*Bentler, 1990)* | Excellent |
| | TLI | 0.941 | TLI > 0.90 *(Bentler and Bonett,1980)* | Excellent |
| | NFI | 0.911 | NFI > 0.90 *(Bentler and Bonett, 1999)* | Excellent |
| Parsimonious Fit | Chisq/df | 2.197 | Chisq/df < 3.0 *(Hair et al., 1998)* | Excellent |
| | PNFI | 0.792 | PNFI > 0.50 *(James, Mulaik and Brett, 1982)* | Excellent |

**Structural Equation Modelling (SEM)**

After the development of the measurement model, the SEM was employed to identify the intricate relationships between TPB constructs and their influence on public transport usage behavior. In the present study, the Dependent variables identified are Intention, Use Behaviour and the Independent Variables identified are Attitude, Subjective Norms, Perceived Behavioural Control. By using structural equation modeling (SEM), the study assessed the impact of these factors on adoption behavior and determined the strength and direction of these influences. The path diagram *(Fig.3.)* shows the structure of the model and for interpreting the results of the SEM analysis. The path coefficients were estimated to measure the strength and direction of the relationships between the variables as shown in *Table 8*. The criteria applied for the interpretation of results are t-statistics greater than 1.972 (>1.972) with a p-value significance rate less than 0.05 (<0.05) and a positive path loading. The path loadings conclude positive and statistically significant relationships among most constructs, except for subjective norms. This shows that factors like attitude, perceived behavioural control, and intention have a positive impact on use behaviour.

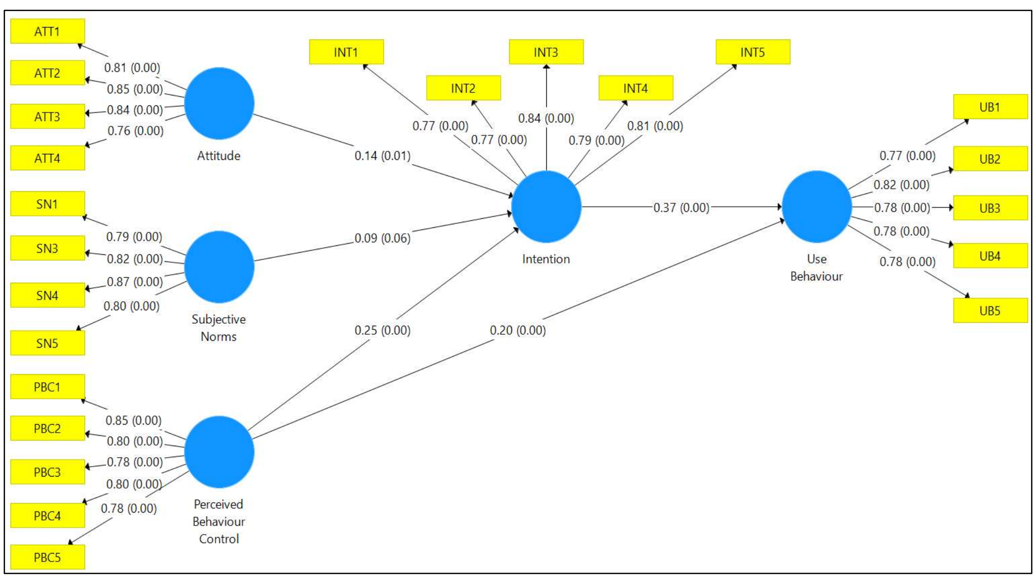


Fig.3. SEM Path Diagram with Path Coefficients and P-values

**Table 8.**
Path Coefficients

| | Sample Mean (M) | Standard Deviation (STDEV) | P Values |
|---|---|---|---|
| ATT -> INT | 0.140 | 0.051 | 0.008 |
| INT -> UB | 0.374 | 0.059 | 0.000 |
| PBC -> INT | 0.250 | 0.052 | 0.000 |
| PBC -> UB | 0.202 | 0.049 | 0.000 |

| | | | |
|---|---|---|---|
| SN -> INT | 0.090 | 0.045 | 0.068 |

**Assessing Measurement Items within Constructs**

The examination of the individual items used to measure each construct within the TPB model applied to public transportation adoption is performed using Friedman's tests, a non-parametric statistical technique. This is conducted to assess the hypothesis of whether there are significant differences in the mean ranks of the items within each construct of the TPB model related to public transportation adoption.

**Table 9.**

Friedman Test Results and Mean Ranks for TPB Model Constructs

| Constructs | Test Statistic ($\chi^2$) | df | p-value | Highest Mean Rank | Lowest Mean Rank |
|---|---|---|---|---|---|
| Attitude | 122.116 | 3 | < 0.000 (Significant) | "Public transportation is a convenient way to travel within the city" (2.83) | "I feel safe and secure using public transportation even during peak hours" (2.25) |
| Subjective Norms | 48.163 | 3 | < 0.002 (Significant) | "I chose to use public transportation because it lowers my travel costs" (2.72) | "If more people use it I would be more inclined to use it as well" (2.26) |
| Perceived Behavioural Control | 85.834 | 4 | < 0.000 (Significant) | "I find it easy to access public transportation... near my home or workplace" (3.33) | "I feel confident managing crowded situations, even during rush hours" (2.62) |
| Intention | 25.238 | 4 | < 0.001 (Significant) | "I plan to use public transportation as my primary mode of transportation in the next few months" (3.13) | "I am confident I can overcome any challenges or inconveniences associated with using public transportation" (2.85) |
| Use Behaviour | 54.007 | 4 | < 0.000 (Significant) | "I feel more inclined to use public transport when I have direct access to my workplace and residence" (3.27) | "I feel encouraged to use public transport more regularly when there are incentives from the government" (2.82) |

The analysis using Friedman's tests as shown in *(Table 9.)* reveals significant differences in the mean ranks of items within each TPB model construct related to public transportation adoption. Within the attitude construct, convenience is seen as the most positively perceived aspect, while safety during peak hours remains a significant concern. In terms of subjective norms, cost-effectiveness is emphasized as a significant influence, while the impact of social norms is comparatively less evident. The perceived behavioural control construct shows that accessibility is a strong positive factor, whereas managing crowded situations during rush hours poses challenges. For the intention construct, there is a strong inclination to use public transportation as the primary mode, although concerns about overcoming challenges persist. The direct access to workplaces and residences is a major driver of use behaviour, while government incentives have a lesser impact.

**Conclusions:** The variables influencing the use of public transportation were investigated in this study. The demographics of the respondents provided insight into their social and economic traits as well as the public transportation mode that they use most frequently. Theory of Planned Behaviour is the baseline model based on which this study is conducted. The validity and dependability of the constructs in prediction of the use of public transportation were validated by confirmatory factor analysis. There was a statistically significant difference found between key aspects such as UB, PBC, ATT, and INT. This result emphasises the intricate interactions among various elements that influence a person's transportation preferences. The adoption of public transportation is influenced by attitudes and intentions, which highlights the importance of promoting positive attitudes and intentions in potential users. The SEM approach confirmed the TPB model's effectiveness in interpreting behaviour toward adopting public transportation. The model effectively demonstrated the factors impacting user's behavioural intentions and actual usage patterns through strong and significant relationships. More research is needed to understand how social factors influence transportation choices due to the lack of a significant impact between behavioural intention and subjective norms. The analysis of mean ranks across various constructs helps to determine important areas that need improvement. Thus, this study offers crucial insights for decision-makers and transportation authorities by prioritizing accessibility, affordability, and convenience, policymakers can improve public transportation services.

**imitations and Future Scope**

This research is geographically confined to a specific city, may not fully represent the entire spectrum of public transport users in India. Future studies should encompass comparative analyses across a range of Indian cities with diverse public transport systems to enhance the understanding of public transportation adoption and to identify both generalizable patterns and city-specific challenges. To deepen the comprehension of urban mobility dynamics, it is crucial for future research to incorporate additional constructs such as environmental concern, safety, and security (Ali, Nakayama, & Yamaguchi, 2023). This approach could elucidate the influence of environmental consciousness on user behavior and facilitate the development of targeted strategies for promoting sustainable transportation. User segmentation and longitudinal studies could offer profound insights into the variations in public transport adoption behavior across diverse demographic groups and over time, aiding in the development of effective, user-centric transportation policies.

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