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A Study on Evaluating Impact of Environmental Concern on Intention to Use Eco Friendly Public Transport

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Abstract

In India, eco-friendly public transportation such as electric buses, metro systems, and ride-sharing schemes is progressively growing to lower emissions and ease traffic in cities. Reduced air pollution, fewer greenhouse gas emissions, better public health, and more sustainable urban mobility are all advantages of eco-friendly public transportation that help create a cleaner and healthier environment. Concern for the environment is a reflection of people's knowledge and concern for environmental issues, which shapes their decisions towards sustainable practices. This study is motivated with the focus to promote sustainable urban mobility in India by determining how environmental concerns affect the intention to use eco-friendly public transport. The technique used in the current study is Structural Equation Model. The findings of the study indicated that there is a significant impact of environmental concern on intention to use eco-friendly public transport.

Keywords: Structural Equation Model, SMART PLS, Theory of Planned Behaviour Environmental Concern, Eco-friendly Public Transport.

Introduction:

Developing economies go through a special stage of economic expansion, population increase, and massive urbanisation. Road transport predominates in India since a third of the population lives in metropolitan areas. The development of public transportation infrastructure is necessary to provide users with an efficient, safe, and effective system; for this, one strategy is to fortify the current public transportation system. Good public transport will increase mobility, combat pollution, and lessen traffic jams and accidents on the road system. Urbanisation, or population growth, and changes in the demand for travel on the corridors are the two main causes of the substantial increase in the number of vehicles and the need for transportation, according to the observation. This rise of automobiles pollutes the environment, including the air and noise, which lowers people's quality of life and negatively impacts their health. There is a great need to research this parameter and suggest appropriate, implementable solutions. According to previous research and scientific evidence, atmospheric CO2 is the primary cause of global warming and climate change, which has become a serious issue globally. (Nikhilesh, et al. 2017).

A World Bank study that gathered air pollution data from 103 countries found that about 100% of Indians are exposed to harmful greenhouse gases (GHGs) above the WHO air quality guideline, and that 98% of cities in developing countries do not meet air quality standards (Global Mobility Report, 2017). Growing greenhouse gas emissions from anthropogenic activities warm the climate, leading to climate change,

which in turn triggers a host of other changes around the world. The main driver of climate change since the middle of the 20th century has been human activity-induced greenhouse gas emissions (EPA, 2021). With CO2 making up over 76% of all greenhouse gas emissions, burning fossil fuels for transportation is one of the main anthropogenic activity that contributes to the most destructive emissions. Global warming and climate change are the main causes of CO2, a greenhouse gas (GHG) rather than a pollutant. (Nikhilesh, et al. 2017).

The main source of CO2 emissions in India is road transport, particularly vehicles, with 2.25 crore cars registered altogether (Community.data.gov.in, 2015) and a growth rate of 14.78% each year (SIAM, 2017). The majority of mobility activities take place in India's high-density urban and suburban areas, where the situation is gradually getting worse. This problem is exacerbated by the fact that up to 30% of modern conventional car engines have poor combustion efficiency (Saurabh, Kumar 2022).

Increasing travel duration, rising private vehicle mode share, and falling public transport share are other characteristics of the current state of public transport. As a result, poor air quality, noise, unnecessary road safety, and congestion are often the outcomes. A technique known as "Green Bus" uses compressed natural gas (CNG) as fuel; these buses are inexpensive, clean and non-polluting. Among the many amenities that Green Bus offers its passengers are convenience, comfort, safety, and automation. It offers environmentally beneficial public transport in India and a sustainable future because of its fewer emissions.

Review of Literature:

1. **Anisa, & Milda. (2023)** investigated the factors that influences commuter's intention to use Trans Metro in Indonesia, focusing on the role environmental concern plays in the minds of the travellers. It was seen that those individuals whose intention to use Trans Metro was significantly influenced by their 'attitude towards the behaviour subjective norms. However, it was discovered that "perceived behavioural control and environmental concerns" had no significant association.
2. **Saurabh, Kumar. (2022)** developed a model to identify the factors that influence Indian consumer's intention to adopt electric vehicle (EVs). It was found that the intention most substantially influenced by the purchasing price, perceived behavioural control, personal norms, environmental concerns, sustainable behaviour, driving range and household income. The association between EV usage intention and personal norms and sustainable behaviour was somewhat mediated by environmental concerns. The relationship between driving range and intention to use an EV was mediated by purchase price.
3. **Kuberkar, S., & Singhal, T. K. (2020).** investigated the elements affecting the intention of citizens to adopt an AI-powered chatbot for providing automated information services on public transit in the context of smart cities. The study discovered that social influence, anthropomorphism, trust, facilitating conditions, performance expectancy, and effort expectancy all had a significant impact on the desire to use the chatbot for public transit services. It was demonstrated that the suggested chatbot solution had societal ramifications since it might encourage more people to use public transport, which would lessen traffic, delays, and pollution.
4. **Weiya, et al. (2019)** sought to use an enlarged theory of planned behaviour (TPB) to investigate the factors influencing the pro-environment travel (PET) behaviour of urban dwellers, with a particular focus on individual behaviours and the quality of public transport systems. According to the study, pro-environment travel (PET) behaviour is influenced mostly by intention and habit, with attitude

having the biggest impact on intention. PET behaviour was directly impacted by perceived public transport service quality, with satisfaction serving as a mediating factor. The most significant determinants of service quality were the vehicle environment, operation, and management. PET behaviour was strongly impacted by demographic variables as income, automobile ownership, and driving age.

5. **Muhammad, Waqas., et al. (2018)** explored the customer's attitude towards sustainable transportation and their willingness to adopt environmental friendly options such as green transport and cycling. It was found that there is a strong influence of sustainable transportation on awareness and its benefits and problems related to traffic. It was found that people who drove cars for symbolic reasons were less accepting towards sustainable alternatives. Sustainable transportation's acceptability was impacted by self-enhancement negatively and self-transcendence positively.
6. **Priyanka. & Jagruti (2018)** analysed the need for non-motorized transport (NMT) facilities at selected Bus Rapid Transit System (BRTS) nodes in Ahmedabad, India to support sustainable transportation. The study emphasised the rising CO_2 emissions and additional adverse effects of India's transportation sector. It underlined how important it is to change the emphasis from car movement to human mobility, particularly for excursions under 3 to 4 km, which are typically completed by bicycle and foot. It has been demonstrated that NMT modalities advance accessibility, social justice, and health for people of all socioeconomic backgrounds.
7. **Krishnaswamy, et al. (2016)** aimed to identify the factor that influence the underutilization of free bus services in Malaysia. The study found that "perceived ease of use, perceived usefulness, moral obligations, and subjective norms" have a significant influence on the intention to use the free bus services. It was also found that "financial incentives" did not have any significant influence on the intention to use the services.

Objectives of the Study:

1. To evaluate the impact of environmental concern on intention to use eco-friendly public transport
2. To give suggestive measures to policymakers and public transport authorities to enhance the use of eco-friendly public transport

Hypothesis:

H_0: The impact of environmental concern on intention to use eco-friendly public transport is insignificant
H_1: The impact of environmental concern on intention to use eco-friendly public transport is significant

Research Methodology:

Table No: 1 Research Methodology

Aspect	Details
Sample Size	235 public transport commuters (Minimum necessary sample size: 200)
Effect Size	0.3
Statistical Power	0.9
Number of Latent Variables	4
Number of Observable Variables	24
Probability Level	0.05

Sampling Method	Non-random purposive sampling
Data Gathering Methods	Primary and secondary data
Analytical Method	Structural Equation Model (SEM)
Analytical Tool	SMART PLS

Data Analysis and Interpretation:

Table No: 2 Reliability and validity

Path	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Environmental Concern	0.907	0.906	0.617
Intention to Use	0.900	0.900	0.645

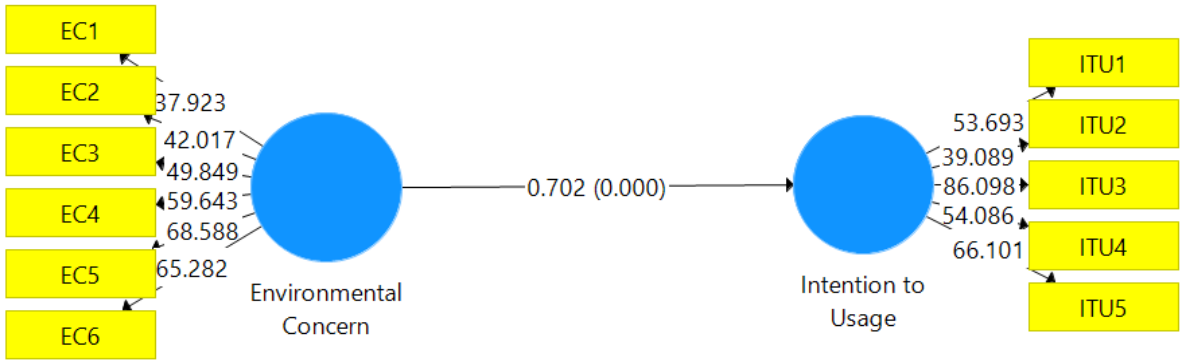
As all the values are as per the recommended criteria of Hair et al 2013, we can conclude that there exist an adequate reliability and convergent validity.

Table No: discriminant validity

Path	Environmental Concern	Intention to Use
Environmental Concern	0.786	
Intention to Use	0.774	0.803

As per the fornell larcker criteria, it can be concluded that the constructs are distinct and there exist and adequate Discriminant validity.

Figure No: 1 SEM model



Structural equation modelling, or SEM, is a thorough statistical technique for investigating complex relationships between observable and latent variables.

Table No: Hypothesis testing

Path	Beta Coefficient	T-statistics	P-value
Environmental Concern → Intention to use	0.702	25.914	0.000

P (value) < level of significance 5% thus H_0 is rejected and H_1 is accepted indicating significant impact of environmental concern on intention to use

Conclusion:

The study found that people's intention to use environmentally friendly public transport is significantly influenced by their level of environmental concern. People are more inclined to select environmentally friendly modes of transportation, like electric buses or metro systems, over traditional automobiles when they are more conscious of environmental issues and their effects. Ultimately, the results point to the potential importance of raising environmental awareness in boosting the use of environmentally efficient public transportation. These findings demonstrate how well environmental policies and campaigns can influence commuter preferences in favour of more environmentally friendly modes of transportation.

Suggestions:

- The government should launch awareness campaigns that emphasises the environmental benefits of using eco-friendly public transport.
- They should provide incentives such as discounts and loyalty points to regulary users of eco-friendly public transport commuters.
- The education institutions can be partnered with to integrate into their curriculum the importance of eco-friendly public transport.
- The government should invest in the development and maintenance of efficient, comfortable and accessible eco-friendly transport options.
- The policymakers and governments can also put up hoarding and billboards for the public to see and understand the environmental impact of eco-friendly transport choices.
- Social media can be used to seek ideas to design and implement environmental campaigns and transit solutions tailored to the local needs, that are eco-friendly and appealing to the community.

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