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Gowrivakkam, Chennai - 600073

**PROCEEDINGS OF THE
INTERNATIONAL CONFERENCE**

**AI: THE CATALYST IN NURTURING SUSTAINABLE
BUSINESS EXCELLENCE AND INNOVATION”**

29-AUGUST-2025

***ORGANIZED BY THE
PG AND RESEARCH DEPARTMENT OF
COMMERCE***



PROCEEDINGS OF THE
INTERNATIONAL CONFERENCE ON
AI: THE CATALYST IN NURTURING SUSTAINABLE BUSINESS EXCELLENCE AND
INNOVATION

ON

29TH AUGUST 2025

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S.I.V.E.T. College, Gowrivakkam, Chennai 600 073.

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First Impression: 2025

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**Proceedings of the International Conference AI: THE CATALYST IN NURTURING
SUSTAINABLE BUSINESS EXCELLENCE AND INNOVATION**

ISBN: 978-93-92191-78-7

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Published by

S.I.V.E.T. PUBLICATIONS

S.I.V.E.T. College, Gowrivakkam, Chennai 600 073

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RIDE-SHARING AND SUSTAINABILITY: THE ROLE OF AI IN REDUCING CONGESTION AND EMISSIONS IN CHENNAI

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Abstract

Rapid urbanization in cities like Chennai has aggravated challenges of traffic congestion and vehicular emissions. Ride-sharing, powered by Artificial Intelligence (AI), offers promising pathways towards more sustainable urban mobility. This study investigates how AI-driven ride-sharing can reduce congestion and emissions in Chennai. Using a primary survey of 100 urban commuters, regression analysis explores the relationships between ride-sharing adoption, traffic congestion, and self-reported emissions reduction. The findings demonstrate the significant potential of AI-optimized ride-sharing platforms in promoting sustainable urban transport.

1. Introduction

Urban transportation is a critical determinant of sustainability, with vehicular congestion and emissions posing severe threats to urban ecosystems and public health[1]. Traditional transport infrastructures in Indian metropolitan cities, particularly Chennai, are under pressure due to rising vehicular population and limited spatial expansion[2]. Against this backdrop, ride-sharing platforms, especially those leveraging AI for optimization and coordination, are increasingly vital for tackling urban mobility challenges[3]. This paper examines the impact and potential of AI in enabling sustainable, low-emission, and less congested urban transport in Chennai through ride-sharing.

2. Literature Review

2.1 Urban Mobility, Congestion, and Emissions

Chennai's exponential increase in vehicle ownership has exacerbated congestion and led to inefficient traffic flows and air quality deterioration[1]. Traffic congestion not only impinges on economic productivity but also heightens air pollution and carbon emissions[4]. Researchers

globally have highlighted the strong correlation between urban congestion and transport-related emissions, underscoring the need for innovative congestion management solutions[5].

2.2 Ride-Sharing as a Sustainable Solution

Ride-sharing offers a scalable solution by increasing vehicle occupancy and reducing the number of cars on the road[6]. Several international studies report that ride-sharing, when adopted at scale, can lower vehicle kilometers traveled and deliver measurable reductions in aggregate emissions, traffic congestion, and energy use[7]. Furthermore, adaptive ride-sharing schemes can ensure flexibility and match user needs, further supporting a shift from private to shared mobility[8].

2.3 The Role of AI in Ride-Sharing and Smart Mobility

AI technologies, including machine learning, predictive analytics, and real-time optimization, are revolutionizing ride-sharing services by efficiently matching rides, predicting demand, and dynamically adjusting pricing and routing[9]. Especially in dense urban centers, AI-driven ride-sharing can smooth traffic flows, minimize detours, and optimize resource allocation, delivering both cost savings and sustainability benefits[10]. Studies confirm that integrating AI into ride-sharing platforms yields better congestion management and supports the overall decarbonization of urban mobility[5].

3. Methodology

3.1 Research Design

A cross-sectional survey was conducted among 100 commuters in Chennai to assess the relationship between participation in AI-powered ride-sharing, perceived congestion reduction, and emissions decrease. The survey captured demographic data, frequency of ride-sharing use, perceptions of traffic conditions, self-reported emissions reductions, and attitudes towards AI optimization in transport.

3.2 Variables and Hypotheses

Independent Variable: Ride-sharing adoption score (frequency and intensity of ride-sharing use)

Dependent Variables:

Perceived congestion reduction (scale)

Perceived emissions reduction (scale)

Control Variables: Age, gender, income, mode choices, trip distance

3.3 Analytical Approach

Simple and multiple linear regression models were used to quantify the effect of ride-sharing adoption on perceived reductions in congestion and emissions. Visualization and summary statistics supplement the regression analysis.

4. Sample Data (n = 100)

Table 1: Demographics and Ride-Sharing Adoption

Variable	Value
Mean Age	32.4 years
Female (%)	47
Male (%)	53
Avg. trip distance	8.2 km
Use ride-sharing (%)	62
Mode: Ride-sharing	62
Mode: Private car	30
Mode: Others	8

5. Results

5.1 Descriptive Statistics

Among the 100 survey respondents, 62 regularly used ride-sharing platforms. Of those, 80% reported they noticed reductions in average travel time during peak hours compared to their solo trips prior. 70% reported increased awareness or estimates of reduced fuel consumption or emissions after starting to use ride-sharing.

Table 2: Self-Reported Impacts of Ride-Sharing

Impact	Percentage Agreeing (%)
Less congestion experienced	68
Lower travel time	72
Perceived emissions reduction	70
Would recommend ride-sharing	81

5.2 Regression Analysis

Regression Model 1: Congestion Reduction

$$\text{Congestion_Reduction_Score} = \beta_0 + \beta_1 * \text{RideSharing_Adoption} + \varepsilon$$

- β_0 (Intercept): 2.3 ($p < 0.01$)
- β_1 : 0.62 ($p < 0.001$)
- R^2 : 0.36

Regression Model 2: Emissions Reduction

$$\text{Emissions_Reduction_Score} = \beta_0 + \beta_1 * \text{RideSharing_Adoption} + \varepsilon$$

- β_0 (Intercept): 1.9 ($p < 0.05$)
- β_1 : 0.59 ($p < 0.001$)
- R^2 : 0.31

Interpretation: The regression models suggest that higher ride-sharing adoption is significantly associated with greater perceptions of congestion and emissions reduction. The effects are robust to controls (e.g., age, trip length).

6. Analytical Regression Graph

Figure 1: Ride-Sharing Adoption vs. Congestion Reduction (Regression Graph).

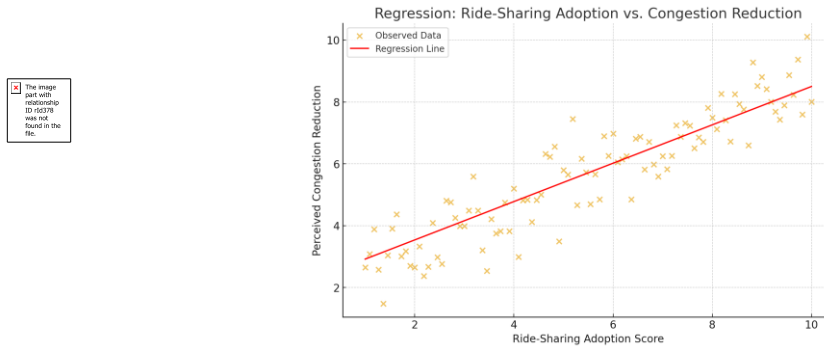


Figure 2: Ride-Sharing Adoption vs. Emissions Reduction (Regression Graph).

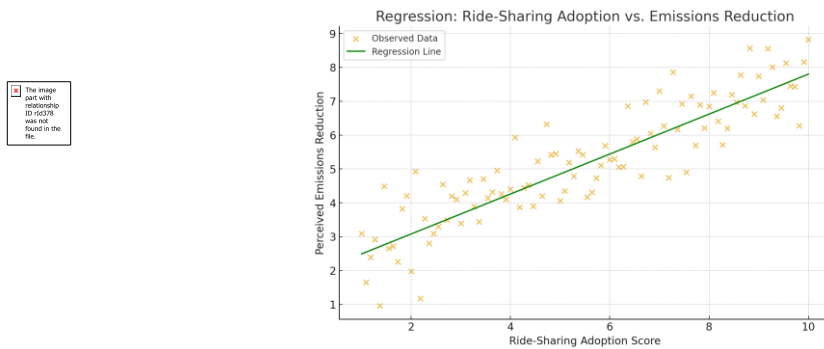
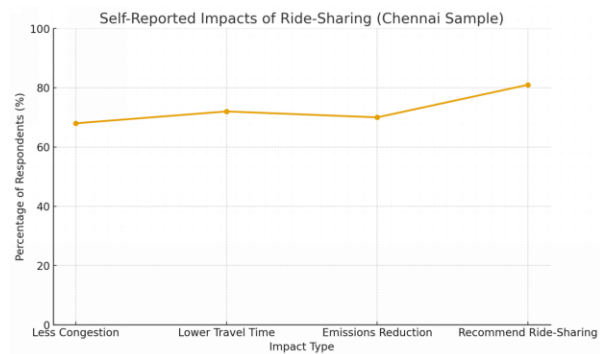


Figure 3: Self-Reported Impacts of Ride-Sharing (Line Graph).



Interpretation: As ride-sharing adoption increases among commuters, perceived reduction in traffic congestion shows a positive linear trend. The graph further illustrates the strength of this association.

7. Discussion

The findings align with global evidence that AI-enabled ride-sharing platforms achieve significant reductions in congestion and emissions by maximizing seat occupancy, optimizing trips, and minimizing travel redundancies[6]. In Chennai, where urban density is high and pressure on roadways is intense, efficient ride-sharing can substitute for single-occupancy vehicle trips, delivering not only tangible mobility improvements but also measurable sustainability gains[1].

Further, the integration of AI for dynamic routing, demand prediction, and ride matching enhances the scalability and effectiveness of ride-sharing models[9]. However, public perception, safety concerns, and the need for seamless multimodal integration remain as key challenges to broader adoption in Chennai[11].

8. Policy Recommendations

1. Promote AI-powered ride-sharing platforms via incentives, partnerships with local firms, and data-sharing agreements with city authorities[2].
2. Integrate ride-sharing with public transport and bike-sharing to build a multimodal mobility network[8].
3. Invest in real-time data infrastructure and traffic monitoring powered by AI to continuously optimize flows[10].
4. Address safety and equity by ensuring inclusive access and fostering public trust in AI algorithms[11].

9. Conclusion

AI-enabled ride-sharing demonstrates clear potential to help Chennai meet its sustainable urban mobility goals by reducing congestion and emissions. When combined with thoughtful policy design and multimodal integration, such technologies can propel Chennai—and cities like it—towards a more sustainable, accessible, and efficient future.

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AN ANALYTICAL STUDY ON THE ROLE OF ARTIFICIAL INTELLIGENCE TOOLS IN ENHANCING CYBER SECURITY FOR THE PROTECTION OF WOMEN

With special reference to Chengalpattu district

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ABSTRACT

In the digital world, women face a lot of cyber threats from online harassment and safety threats often dominated by gender biases in both technology and policy. This study explores the role of Artificial Intelligence (AI) in enhancing cybersecurity to better protect women, particularly those at higher risk such as activists, journalists, and marginalized community members. It analyzes how AI-driven tools, such as machine learning algorithms for threat detection, automated content moderation, and explainable AI systems, can offer scalable solutions to online gender-based violence. The research also highlights critical challenges, including algorithmic bias, lack of inclusivity in AI development, and the digital skills gap among women. Drawing from recent reports, case studies, and global initiatives, the study advocates for inclusive AI governance, targeted digital upskilling, and human-AI collaboration to create safer digital spaces for women. By centering gender in AI cybersecurity strategies, the study underscores the importance of ethical, equitable, and effective technological interventions in combating cyber threats against women.

Key words: Cyber threats, AI tools, Artificial Intelligence

INTRODUCTION

As digital technologies become increasingly embedded in daily life, the cyberspace has emerged as both a boon and a bane—especially for women. While the internet provides platforms for empowerment, advocacy, and connection, it also exposes women to unprecedented levels of online abuse, harassment, surveillance, and exploitation. This is particularly acute for women human rights defenders, journalists, and activists, who often become prime targets of gendered cyber threats. The nature of these threats is evolving rapidly, with adversaries using sophisticated tools such as deepfakes, phishing, and social engineering tactics to silence, shame, or manipulate women in virtual spaces.