IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.53
Volume 4, Issue 2, November 2024

A Study on Bike Share Analysis

S Poornima[1] and Dr Manjunath N[2]
Student, Department of MBA[1]
Assistant Professor, Department of MBA[1]
RNS Institute of Technology, Bengaluru, Karnataka, India

Abstract: *This study explores the role of bike-sharing programs within urban mobility and the potential impacts of autonomous vehicles (AVs) on cyclists' safety perceptions and behaviour. The research focuses on analysing factors that influence the adoption of bike-sharing services, including safety perceptions, AV technology familiarity, and demographic characteristics. Using tools like MS Excel and statistical models such as multiple regression and logistic regression, the study examines patterns in bike-sharing usage, public attitudes toward AVs, and the implications of AV testing on public streets. Findings suggest that factors like age, perceived safety, and AV familiarity significantly influence bike-sharing behaviour. The study recommends enhanced infrastructure, integration with public transit, and data-driven insights to improve bike-sharing systems and promote safer interactions with AVs.*

Keywords: Bike-sharing, Autonomous vehicles, Urban mobility, Safety perception, Regression analysis, Data analytics, Public transit integration, Cycling infrastructure

I. INTRODUCTION

The Bike-Share Analysis explores the importance of bike-sharing programs as a sustainable and affordable urban transportation solution. Initially emerging in Europe, bike-sharing has expanded globally, addressing issues such as traffic congestion, carbon emissions, and public health. This study examines factors influencing bike-sharing adoption, such as urbanization, environmental policies, and cycling infrastructure investments. By analysing usage patterns through descriptive research methods, the study provides insights for urban planners and policymakers to optimize bike-sharing infrastructure. Predictive models like multiple regression help forecast demand and enhance operational efficiency. This research highlights bike-sharing's role in reducing urban traffic and its positive impact on the environment, with recommendations for infrastructure improvements and technological advancements to enhance program sustainability.

II. OBJECTIVES

- To identify the factors influencing bike sharing.
- To analyse the influence of Safe AV, Safe Human, and Age on shared cycling behaviour.
- To analyse the impact of Familiarity with Technology, AV Impact, Proving Ground, Speed Limit, and data-sharing practices on shared pedestrian experiences.
- To evaluate the impact of bike-sharing programs on urban mobility, including effects on traffic congestion, public transit, and sustainability.

III. LITERATURE REVIEW

According to Chibwe, Heydari, Faghih Imani, and Scurtu (2021), an analysis of London's bike-sharing system from the London Olympics through the Covid-19 pandemic shows that various factors, including unemployment rates and the availability of docking stations, significantly impact daily bike hire patterns. The study highlights the complexity of bike-sharing demand and the importance of understanding how these factors interact to drive usage.

Miriam Ricci (2015) reviewed the impacts and implementation processes of bike-sharing programs, emphasizing their potential to boost cycling rates and sustainable urban mobility. Ricci also identified challenges such as the uneven distribution of benefits and operational issues like network rebalancing, suggesting that additional measures are needed to fully support these programs.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.53
Volume 4, Issue 2, November 2024

In a study by Xiaoming Han and Jerry Gao (2017), bike-sharing data from Silicon Valley was analysed using predictive modelling to forecast demand at bike stations. The research, focusing on peak commuting hours, confirmed that effective data utilization can enhance operational efficiency and customer satisfaction in bike-sharing systems.

IV. RESEARCH METHODOLOGY

The research employed a descriptive methodology focused on observing and documenting existing conditions related to bike-sharing systems. This approach enables an in-depth understanding of factors such as user behaviour, peak usage, geographic distribution, and demographic characteristics. Data was collected from secondary sources, primarily utilizing datasets available on Kaggle, to examine bike-sharing patterns effectively.

SAMPLING

The study utilized simple random sampling to ensure a representative subset of the bike-sharing population, selecting a sample size of approximately 700-800 individuals.

STATISTICAL TOOLS

- **Microsoft Excel:** data organization, visualization, and basic statistical analysis, such as creating charts and calculating descriptive statistics.
- **SPSS software:** multiple regression analysis to examine the relationships between independent variables and dependent variables.

HYPOTHESIS TEST

Null Hypothesis(H_0)

H_0 - Familiarity Tech, AV Impact, Proving Ground, Speed25Mph, Share Trip Data, Share Performance Data, and Report Safety Incident do not influence Shared Pedestrian .

Alternative Hypothesis(H_1)

H_1 - Familiarity Tech, AV Impact, Proving Ground, Speed25Mph, Share Trip Data, Share Performance Data, and Report Safety Incident do influence Shared Pedestrian.

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	54.630	7	7.804	74.033	.000b
	Residual	82.963	787	.105		
	Total	137.592	794			

ANOVA[a]

A**. Dependent Variable**: Shared Pedestrian

B. **Predictors**: (constant), Familiarity Tech, AV Impact, Proving Ground, Speed25Mph, Share Trip Data, Share Performance Data, Report Safety Incident

Inference: Since the SIG value of 0.000 is less than the standard P value of 0.05, we reject the H_0 and conclude that Familiarity Tech, AV Impact, Proving Ground, Speed25Mph, Share Trip Data, Share Performance Data, and Report Safety Incident do influence Shared Pedestrian.

Co-efficient[a]

Model		Unstandardized Co-efficient		Standardized Co-efficient			Significant / Insignificant
		B	Std. Error	Beta	t	Sig.	
1	Familiarity Tech	.016	.009	.046	1.652	.099	Insignificant
	AV Impact	-.006	.010	-.018	-.613	.099	Insignificant
	Proving Ground	-.037	.008	-.133	-4.577	.000	Significant
	Speed25Mph	.700	.049	.424	14.376	.000	Significant
	Share Trip Data	.544	.059	.296	9.235	.000	Significant

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.53
Volume 4, Issue 2, November 2024

	SharePerformance Data	-.224	.172	-.038	-1.300	.194	Insignificant
	Report Safety Incident	.383	.086	.137	4.460	.000	Significant
	(Constant)	-.502	.188		-2.665	.008	-

V. DISCUSSION AND RESULTS

The study on bike-sharing behaviour in urban settings, particularly regarding autonomous vehicles (AVs), shows key trends. Through data visualization and regression analysis, it was found that perceived safety with AVs positively influences bike-sharing adoption, indicating that trust in AV technology supports sustainable transport. Younger users were more likely to adopt bike-sharing, while public support was strong for AV data transparency, aligning with preferences for AV accountability.

KEY FINDINGS

Positive Impacts:

- **Safety Perception:** Confidence in AV technology encourages cyclists to share the road.
- **Support for Transparency:** 75% of respondents favour AV companies sharing operational data.

Negative Impacts:

- **Age Gaps:** Older cyclists are less willing to engage with AVs on shared roads.
- **Safety Incidents' Impact:** High-profile AV incidents increase public scrutiny and concern.

VI. CONCLUSION

Bike-sharing is pivotal for urban mobility and environmental benefits. AVs impact bike-sharing adoption through public perceptions of safety and demographics, presenting both challenges and growth opportunities. The study underscores age-specific strategies and data transparency to enhance trust and adoption, recommending collaboration between policymakers, AV companies, and communities to ensure safe, sustainable urban transportation.

VII. LIMITATIONS

- Reliance on secondary data can impact the study's reliability due to variations in data quality and completeness .
- The lack of primary data collection limits insights into user motives and specific attitudes not captured in available statistics.
- Geographic limitations restrict the applicability of findings, as the study focuses on a single city, which may not represent broader trends.

REFERENCES

[1]. Chibwe, Heydari, Faghih Imani, & Scurtu (2021). "An exploratory analysis of the trend in the demand for the London bike-sharing system: From London Olympics to Covid-19 pandemic.

[2]. Miriam Ricci (2015). "Bike sharing: A review of evidence on impacts and processes of implementation.