

Platform for Stop-based Carpooling

Krushna Jaybhaye¹, Aniket Chavan², Aneesh Wath³, Omkar Sherkar⁴, Sheetal Kapse⁵

Department of Computer Engineering^{1,2,3,4,5}

Smt. Kashibai Navale College of Engineering, Pune, Maharashtra, India

Savitribai Phule Pune University, Pune, India

Abstract: *This paper introduces a transformative stop-based carpooling app designed to address the limitations of existing solutions. By strategically placing designated stops, such as bus stops, our innovative model restricts ride creation and participation exclusively between these stops, ensuring consistent availability, mitigating privacy concerns, and providing users with alternative transportation options. Through a comprehensive study in a representative urban setting, we examine the impact on car occupancy rates, traffic reduction, and user satisfaction, highlighting the model's ability to cater to diverse user needs. The integration with existing public transport systems extends its eco-friendly footprint, while strategically placed stops enhance coverage in areas with fewer active drivers, overcoming the limitations of conventional carpooling solutions. This paper contributes a blueprint for a sustainable and efficient shared mobility system, showcasing the potential of the stop-based approach in revolutionizing urban transportation.*

Keywords: Carpooling, Ride-sharing, Sustainable Urban Transportation, Ride-sharing Platform

REFERENCES

- [1]. Padiya, Jasmin and Bantwa, Ashok, Contribution of Carpool towards Sustainable Urban Transportation – A Study of Ahmedabad City (November 22, 2020).ISSN 2046-0430
- [2]. Julagasingorn, Puthipong & Banomyong, Ruth & Grant, David & Varadejsatitwong, Paitoon. (2021). What encourages people to carpool? A conceptual framework of carpooling psychological factors and research propositions. *Transportation Research Interdisciplinary Perspectives*. 12. 100493. 10.1016/j.trip.2021.100493.
- [3]. Ostrovsky, Michael & Schwarz, Michael. (2019). Carpooling and the Economics of Self-Driving Cars. *EC '19: Proceedings of the 2019 ACM Conference on Economics and Computation*. 581-582. 10.1145/3328526.3329625.
- [4]. Yu (Marco) Nie a and Ruijie Li b, Potential of carpool for network traffic management (June 2022).
- [5]. Lee, JB. Company-Wide Carpooling for Long Distance Commuting in South Korea and Its Effects on Reducing Transportation Problems. *KSCE J Civ Eng* 26, 3226–3234 (2022).
- [6]. R. Hasan, A. H. Bhatti, M. S. Hayat, H. M. Gebreyohannes, S. I. Ali and A. J. Syed, "Smart peer car pooling system," 2016 3rd MEC International Conference on Big Data and Smart City (ICBDSC), Muscat, Oman, 2016, pp. 1-6, doi: 10.1109/ICBDSC.2016.7460384.
- [7]. D. Dimitrijević, N. Nedić and V. Dimitrieski, "Real-time carpooling and ride-sharing: Position paper on design concepts, distribution and cloud computing strategies," 2013 Federated Conference on Computer Science and Information Systems, Krakow, Poland, 2013, pp. 781-786
- [8]. Lugo, N. Aquino, M. González, L. Cernuzzi and R. Chenú-Abente, "Ucarpooling: Decongesting Traffic through Carpooling using Automatic Pairings," 2020 XLVI Latin American Computing Conference (CLEI), Loja, Ecuador, 2020, pp. 358-366, doi:10.1109/CLEI52000.2020.00048.
- [9]. O. Dakroub, C. M. Boukhater, F. Lahoud, M. Awad and H. Artail, "An intelligent carpooling app for a green social solution to traffic and parking congestions," 16th International IEEE Conference on Intelligent Transportation Systems (ITSC 2013), The Hague, Netherlands, 2013, pp. 2401-2408, doi: 10.1109/ITSC.2013.6728586.
- [10]. Rey-Merchán MDC, López-Arquillos A, Pires Rosa M. Carpooling Systems for Commuting among Teachers: An Expert Panel Analysis of Their Barriers and Incentives. *Int J Environ Res Public Health*. 2022 Jul 12;19(14):8533

- [11]. X. Xia, H. Liu, J. Li, X. Liu, R. Zhu and C. Zong, "Carpooling Algorithm with the Common Departure," 2019 IEEE International Conferences on Ubiquitous Computing & Communications (IUCC) and Data Science and Computational Intelligence (DSCI) and Smart Computing, Networking and Services (SmartCNS), Shenyang, China, 2019, pp. 513-520, doi: 10.1109/IUCC/DSCI/SmartCNS.2019.00111
- [12]. M. Anas, G. C and K. G, "Machine Learning Based Personality Classification for Carpooling Application," 2023 International Conference on Intelligent Systems for Communication, IoT and Security (ICISCoIS), Coimbatore, India, 2023, pp. 77-82, doi: 10.1109/ICISCoIS56541.2023.10100353.
- [13]. Y. Duan, T. Mosharraf, J. Wu and H. Zheng, "Optimizing Carpool Scheduling Algorithm through Partition Merging," 2018 IEEE International Conference on Communications (ICC), Kansas City, MO, USA, 2018, pp. 1-6, doi: 10.1109/ICC.2018.8422976.