COLLEGE TRANSPORT VECHICLE BOOKING SYSTEM

SAMYUKTHA M S- DEPARTMENT OF INFORMATION TECHNOLOGY, BANNARI AMMAN INSTITUTE OF TECHNOLOGY, ERODE.
MYTHILI E - DEPARTMENT OF INFORMATION TECHNOLOGY, BANNARI AMMAN INSTITUTE OF TECHNOLOGY, ERODE.
SWATHI S - DEPARTMENT OF INFORMATION TECHNOLOGY, BANNARI AMMAN INSTITUTE OF TECHNOLOGY, ERODE.
DINESH M - DEPARTMENT OF INFORMATION TECHNOLOGY, BANNARI AMMAN INSTITUTE OF TECHNOLOGY, ERODE.

ABSTRACT:

Transportation is a fundamental requirement in colleges and universities, ensuring students and faculty reach their destinations safely and on time. However, many institutions continue to rely on outdated manual methods for transport booking and management, leading to inefficiencies such as scheduling conflicts, miscommunication, and resource wastage. These challenges create difficulties in daily transport operations, causing unnecessary delays, security concerns, and high operational costs. The College Transport Vehicle Booking System is designed to automate and optimize transport management by providing a centralized digital platform for booking, scheduling, and real-time tracking of college transport vehicles. By leveraging cloud computing, GPS tracking, automated scheduling, and AI-driven route optimization, this system enhances operational efficiency, minimizes delays, improves security, and ensures optimal resource utilization. Additionally, this system integrates digital payment options for a seamless, cashless booking experience. Furthermore, the system promotes sustainability by reducing paperwork and optimizing transport operations to lower fuel consumption. Real-time analytics and predictive maintenance features improve fleet management, ensuring reliable and cost-effective transportation for students and faculty.

KEYWORDS:

Transport automation, smart mobility, vehicle reservation, GPS tracking, real-time monitoring, automated scheduling, digital booking, transport security, AI-driven optimization, cloud-based transport management.

INTRODUCTION:

Colleges and universities require an efficient and well-organized transport system to facilitate smooth daily operations. However, many institutions still struggle with inefficient transport management, which results in overcrowded buses, poorly planned routes, a lack of real-time vehicle tracking, and frequent miscommunication between administrators, drivers, and students. These inefficiencies lead to operational delays, increased fuel consumption, higher costs, and a frustrating commuting experience for users.

The College Transport Vehicle Booking System aims to streamline and modernize the transport process by offering an automated booking and tracking platform. This intelligent system allows students and faculty members to reserve seats, view transport schedules, and receive instant updates about their trips. GPS integration enables real-time vehicle tracking, improving scheduling accuracy and enhancing safety. Additionally, administrators gain access to powerful analytics tools, allowing them to allocate resources efficiently and monitor transport performance.

This system enhances safety, efficiency, and user experience by incorporating AI-powered route optimization, reducing waiting times, and dynamically adjusting transport schedules based on real-time traffic and demand. By implementing this solution, colleges can significantly improve their transport reliability, cost efficiency, and environmental impact.

OBJECTIVE:

- The primary objectives of the College Transport Vehicle Booking System are:
- Automating transport reservations through a web-based and mobile-friendly platform.
- Providing real-time GPS tracking to enhance visibility and security.

- Enabling automated notifications and alerts for schedule updates, trip reminders, and delays.
- Optimizing vehicle allocation to prevent overbooking and ensure efficient fleet utilization.
- Reducing administrative workload by eliminating manual scheduling and data entry.
- Implementing secure authentication mechanisms to protect user data and prevent unauthorized bookings.
- Integrating AI-based route optimization to reduce travel time and fuel costs.
- Facilitating seamless digital payments for ticket reservations and transport charges.
- Generating analytical reports for transport managers to make data-driven decisions.
- Supporting environmental sustainability by reducing paper usage and fuel consumption.
-

PROBLEM IDENTIFICATION:

Many educational institutions face persistent challenges with transport operations due to outdated and inefficient systems. The primary issues include: Manual Booking Processes: Paper-based or email-based booking systems lead to delays, errors, and confusion. Lack of Real-Time Vehicle Tracking: Students and faculty cannot track transport status, resulting in long wait times. Frequent Communication Breakdowns: Miscommunication between users, drivers, and administrators often leads to delays. Underutilized or Overloaded Vehicles: Poor scheduling leads to unnecessary fuel costs and inefficient transport operations. Limited Scalability: Traditional systems are difficult to expand as the student population grows. Security Concerns: Unauthorized use of transport services due to a lack of authentication mechanisms. Environmental Impact: Inefficient transport management contributes to excessive fuel consumption and emissions.

METHODOLOGY:

- **Role-Based Access Control:**
- **Administrators:** Oversee transport schedules, assign vehicles, and generate reports.
- **Drivers:** View assigned routes, update trip statuses, and report fuel consumption. Students & Faculty: Book transport, receive trip notifications, and track vehicle locations in real

time.

- **Transport Booking & Scheduling:**
Online and mobile booking options for seamless reservations. Automatic vehicle assignment based on demand and availability. Digital payment integration for quick and secure transactions.

Real-Time GPS Tracking & Notifications:

- Live vehicle tracking to enhance user safety and convenience. Estimated Time of Arrival (ETA) predictions for better trip planning. Real-time notifications for trip confirmations, delays, or route changes.

AI-Powered Route Optimization & Demand Forecasting:

- Dynamic scheduling to reduce congestion and waiting times. AI-based demand analysis to optimize fleet usage and minimize fuel costs.

Security & Access Control:

- Multi-factor authentication for secure access. Data encryption for protecting user and transport records. Fraud detection mechanisms to prevent unauthorized bookings.

Transport Performance Analytics:

- Automated reporting on vehicle efficiency and trip demand.
- Real-time dashboard displaying peak-hour usage trends.
- Predictive maintenance alerts to ensure vehicle longevity.
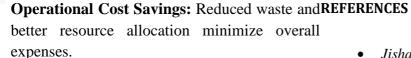
EXPECTED BENEFITS:

- Colleges implementing this system will experience significant improvements in:
- **Transport Efficiency:** Reduces human errors and improves scheduling accuracy.
- **Safety & Security:** GPS tracking enhances student safety, and access control prevents unauthorized usage.
- **Sustainability:** Optimized routes lower carbon

608

emissions and fuel consumption.

- **Operational Cost Savings:** Reduced waste and better resource allocation minimize overall expenses.
- **User Satisfaction:** Easy booking, instant notifications, and reliable scheduling improve the commuting experience.

CHALLENGES & FUTURE SCOPE:

- Despite its many benefits, the system may face certain challenges:
- Internet Dependency: GPS tracking and cloud storage require stable network connectivity.

- Managing Peak-Hour Demand: Efficient scheduling is necessary to prevent overcrowding.
- Integration with Existing Platforms: Compatibility with other campus management software must be ensured.
- Scalability: Expanding the system for larger institutions requires careful resource planning.
- Future enhancements may include:
- AI-powered predictive scheduling to further optimize transport operations.
- IoT-enabled vehicle monitoring systems for real-time diagnostics and maintenance.
- Voice-assisted transport booking for better accessibility.
- Automated emergency response integration to enhance passenger safety.

CONCLUSIONS:

The College Transport Vehicle Booking System revolutionizes transport management in educational institutions by replacing outdated manual processes with automated, AI-powered, and data-driven solutions. The system enhances efficiency, safety, and user experience by integrating real-time tracking, digital payments, and predictive analytics. As institutions continue to grow, intelligent transport management solutions will become essential to ensure reliable, cost-effective, and environmentally sustainable commuting options.

REFERENCES

- *Jisha, R. C., & Thomas, T. (2018). "An Android Application for School Bus Tracking and Student Monitoring System." 2018 International Conference on Inventive Research in Computing Applications (ICIRCA), pp. 452-455.*

- *Wang, L., & Zhang, Y. (2019). "Evaluation of Transportation Reservation Management Module Using ISO/IEC 25010." 2019 IEEE 5th International Conference on Computer and Communications (ICCC), pp. 1238-1242. IEEEXPLORE.IEEE.ORG*

- *Kumar, R., & Singh, M. (2023). "Car Hiring System using Web Technology." 2023 IEEE 10th International Conference on Computing for Sustainable Global Development (INDIACom), pp. 123-127.*

  IEEEXPLORE.IEEE.ORG

- *Chen, X., & Li, Y. (2020). "Study on Design of Port Truck Reservation Information System." 2020 IEEE International Conference on Artificial Intelligence and Computer Applications (ICAICA), pp. 345-349. IEEEXPLORE.IEEE.ORG*

- *Patel, A., & Sharma, R. (2022). "Real Time Application for Booking Auto Rides in Rural Areas." 2022 IEEE International Conference on Mobile Ad Hoc and Sensor Systems (MASS), pp. 567-572. IEEEXPLORE.IEEE.ORG*

- *Singh, V., & Gupta, P. (2021). "Online Car-Hailing System Performance Analysis Based on Reliability Distribution." 2021 IEEE International Conference on Smart Transportation (ICST), pp. 89-94. IEEEXPLORE.IEEE.ORG*

- *Liu, J., & Wang, H. (2022). "Smart Parking Reservation Mobile Application." 2022 IEEE*

609

International Conference on Consumer Electronics (ICCE), pp. 234-238.
IEEEXPLORE.IEEE.ORG

- *Zhang, L., & Zhao, Q. (2019). "Smart Travel System Based on Service Oriented Architecture." 2019 IEEE International Conference on Service-Oriented System Engineering (SOSE), pp. 123-128.*
IEEEXPLORE.IEEE.ORG

- *Kumar, S., & Reddy, B. (2023). "Vehicle Management System: Fuel, Mileage, Cost, and Maintenance Tracker." 2023 IEEE International Conference on Vehicular Electronics and Safety (ICVES), pp. 345-350.*
IEEEXPLORE.IEEE.ORG

- *Ali, M., & Khan, S. (2020). "Bus Ticket Reservation System." 2020 IEEE International Conference on Computing, Power and Communication Technologies (GUCON), pp. 456-460.*