Project Number: 62

Project Title: A Data-Driven Microtransit Platform Using Minibuses for Adaptive Urban Mobility Solutions

Project Clients: Ir. KK Leong & Dr. Matthew Cheng

Project specializations: Software Development;Web Application Development;Mobile Application Development;Computer Science and Algorithms;Artificial Intelligence (Machine/Deep Learning, NLP);Big data Analytics and Visualization;Cloud Computing;Computer Hardware and Networks;Security/Cyber Security;Internet of Things (IoTs);Human Computer Interaction (HCI);

Number of groups: 5 groups

Main contact: Ir. KK Leong & Dr. Matthew Cheng

Background:

As urban populations grow and mobility challenges intensify, the demand for efficient, sustainable, and user focused transportation solutions has never been greater. Traditional transit systems, often inflexible and outdated, fail to address critical issues such as traffic congestion, environmental pollution, and the need for

inclusive, adaptable services that cater to diverse communities. These limitations underscore the urgent need

for innovative solutions that can adapt to the evolving demands of modern urban life while ensuring accessibility

and convenience for all.

This project addresses these challenges by developing a data-driven microtransit platform that leverages fully

customizable 16-seater, 22-seater, and 30-seater minibuses as a core mobility solution tailored to the unique

transportation needs of the Malaysian and Singaporean markets. These minibuses are designed to bridge two

critical gaps in conventional transportation: wheelchair accessibility and ample luggage storage. Unlike

traditional taxis or modern e-hailing services that rely on standard passenger vehicles or SUVs, these minibuses

can be outfitted with specialized features like wheelchair ramps, securement systems, and priority seating,

ensuring safe and comfortable travel for individuals with disabilities or limited mobility. Furthermore, they offer

spacious luggage compartments to accommodate passengers with baggage, such as tourists, airport travellers,

or students - a convenience often lacking in conventional transit options. With their optimal balance of capacity,

flexibility, and efficiency, these minibuses are ideal for a wide range of urban and suburban transit needs.

Inspired by industry players like TransLoc, Moovit, Via, and ReachNow, the platform will integrate cutting-edge

technologies to optimize transit systems, reduce environmental impact, and enhance urban mobility. By offering

on-demand, shared, and efficient ride solutions, the platform will alleviate traffic congestion and promote

sustainable mobility across key sectors, including hotels and resorts, theme parks, paratransit, student transit,

corporate and campus shuttle services, and health and aged care transportation.

The customizable minibuses ensure scalability and adaptability, enabling the platform to serve both small

communities and high-demand urban areas effectively. Designed to meet the diverse needs of modern travellers,

these vehicles combine inclusivity, convenience, and sustainability.

At its core, this project emphasizes the integration of these minibuses as a versatile, scalable, and inclusive mobility solution, supported by data-driven optimization, sustainability, and profitability. By combining advanced technology with a focus on inclusivity, convenience, and environmental responsibility, this initiative seeks to redefine urban transportation for the future.

Requirements and Scope:

Develop a scalable, cloud-based microtransit platform that leverages real-time data, artificial intelligence (AI), and advanced analytics to enhance shared mobility solutions. The platform will utilize 16, 22, and 30-seater minibuses to serve diverse sectors, including

hotels, resorts, theme parks, airports, healthcare and aged care transportation, university campuses and student transit, corporate and campus shuttle services, and paratransit services. This innovative system aims to optimize operations, improve efficiency, and deliver seamless transportation experiences across various industries.

Required Knowledge and skills:

Technology Stack:

• Frontend: Develop an intuitive mobile app (iOS/Android) for booking rides, tracking vehicles, and accessing real-time traffic and route updates.

• Backend: Build a scalable, cloud-based infrastructure to manage real-time data, ride-sharing, and vehicle routing.

• AI & Machine Learning: Implement advanced algorithms for route optimization, traffic prediction, and dynamic service adjustments.

• Passenger Display Systems: Design in-vehicle screens to provide real-time transit information.

• Payment Integration: Support seamless payment processing for passengers and operators.

Expected outcomes/deliverables:

• Source Code

• Documentation

• User Guide

• Presentation deck