



AMAL JYOTHI
COLLEGE OF ENGINEERING
A U T O N O M O U S
KANJIRAPPALLY

YATHRIKAN

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Scrum Master

Amal K Jose

Assistant Professor

Department of Computer Applications

ALBIN THOMAS
AJC23MCA-I012
INTMCA2023-28 S6
Roll No. 12

DEPARTMENT OF
COMPUTER APPLICATIONS



ABSTRACT

This micro project introduces a smart bus assistance system designed to improve the convenience, safety, and efficiency of public transportation. The application provides real-time bus tracking, enabling users to view the live location of buses and receive accurate ETA (Expected Time of Arrival) updates based on speed and distance. It also includes a shortest-route suggestion feature to help passengers choose the fastest and most efficient travel option.

To enhance safety, the system incorporates speed monitoring, which detects over speeding and highlights buses that maintain steady and safe driving conditions. Users can also report issues through a built-in complaint module that supports text, image, and video uploads.

The project further integrates a secure digital ticketing system. In the conductor section of the app, the conductor selects the passenger's destination, after which a QR code containing the fare and trip details is displayed. When the passenger scans this QR code and completes the UPI payment, the app automatically generates a digital ticket containing a unique Ticket ID and QR code.

An additional feature of the system is the User Account History section, where passengers can view their previous trips and completed payments. This helps users keep track of their travel activities, expenses, and ticket details all stored securely within their profile.

An admin dashboard is also included, providing access to bus status, overspeed alerts, complaints, routes, and ticket data. The entire system is developed using Kotlin and Firebase, enabling real-time updates, authentication, cloud storage, and a smooth data flow without requiring a separate backend server.

