



# School Bus Monitoring System

Safety That Travels With You

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# The Challenge: Ensuring Safe School Transport

Tracking school buses in rural and tribal areas presents significant challenges, often leading to uncertainty about their whereabouts and student safety.

This lack of real-time information can cause considerable anxiety for parents and make attendance monitoring difficult for school administrators.

# Our Solution: A Smart IoT Monitoring System

We propose an intelligent IoT-based system designed to revolutionize school bus monitoring. It combines robust technologies to provide comprehensive tracking and communication, ensuring peace of mind for everyone involved.



## IoT Integration

Seamless connectivity for real-time data flow.



## GPS Tracking

Precise location data for every bus.



## RFID Attendance

Automated student boarding and alighting logs.

# Key Features for Enhanced Safety

## 1 Real-time Bus Location

Parents and school authorities can view the exact location of the bus on a map at any given moment.

## 2 RFID-Based Student Boarding Log

Students tap their RFID cards upon entering and exiting, creating an accurate, automated attendance record.

## 3 Automated SMS Alerts to Parents

Parents receive instant notifications when their child boards or alights the bus, and when the bus is nearing their stop.

## 4 Integrated Data Management

Data is stored securely in Firebase and automatically synced to Google Sheets for easy access and reporting.

## 5 Intuitive Live Dashboard UI

A sleek, user-friendly interface provides an overview of all active buses, student attendance, and alert statuses.

# Robust Technology Stack

Our system is built on a foundation of reliable and efficient technologies, ensuring seamless performance and scalability.

**Hardware**  
ESP32, NEO-6M GPS, ESP8266,  
MFRC522 RFID

**Frontend**  
Leaflet.js (for mapping and  
visualization)



## Databases

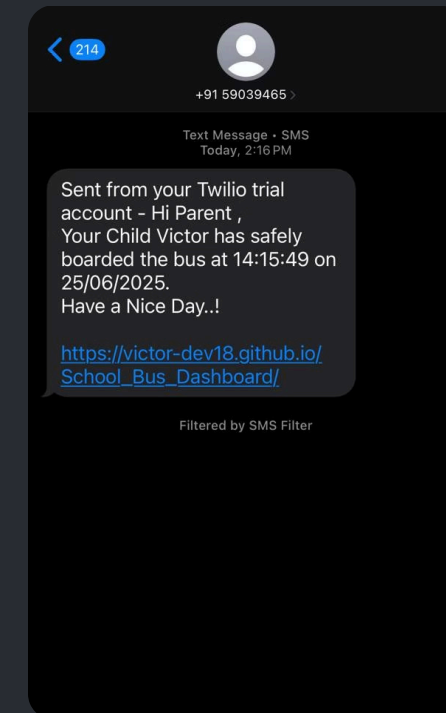
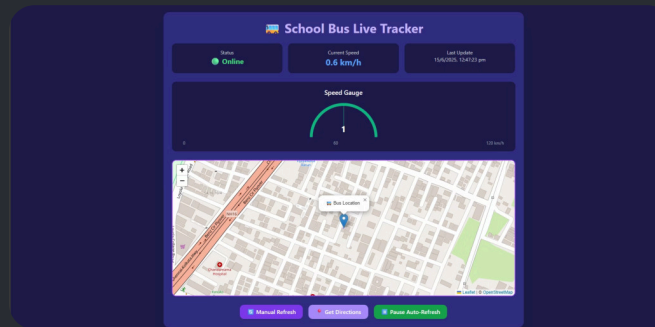
Firebase Realtime DB, Google Sheets

## Communication

Twilio (for SMS alerts)

# Live Demonstration & Impact

Imagine a live dashboard displaying bus routes, student check-ins, and real-time alerts. This system ensures safety, accountability, and peace of mind for all stakeholders.



# Key Takeaways & Next Steps

Our School Bus Monitoring System is designed to bring safety and peace of mind to rural and tribal areas.



## Enhanced Safety

Real-time tracking and alerts for student well-being.



## Improved Accountability

Automated attendance and detailed trip logs.



## Parental Assurance

Reduces anxiety through constant communication.



## Future Expansion

Scaling this solution to serve more communities.

Let's work together to implement this vital system and ensure every child's journey to school is safe and secure.