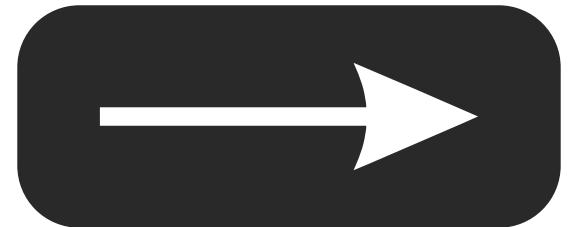


# Passenger Management and Allocation System

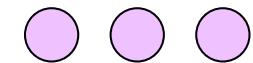


Presented By:

VIJAY GANESH S

RITHAN KOUSHIK K

RAM SIVANESH BS



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# Agenda

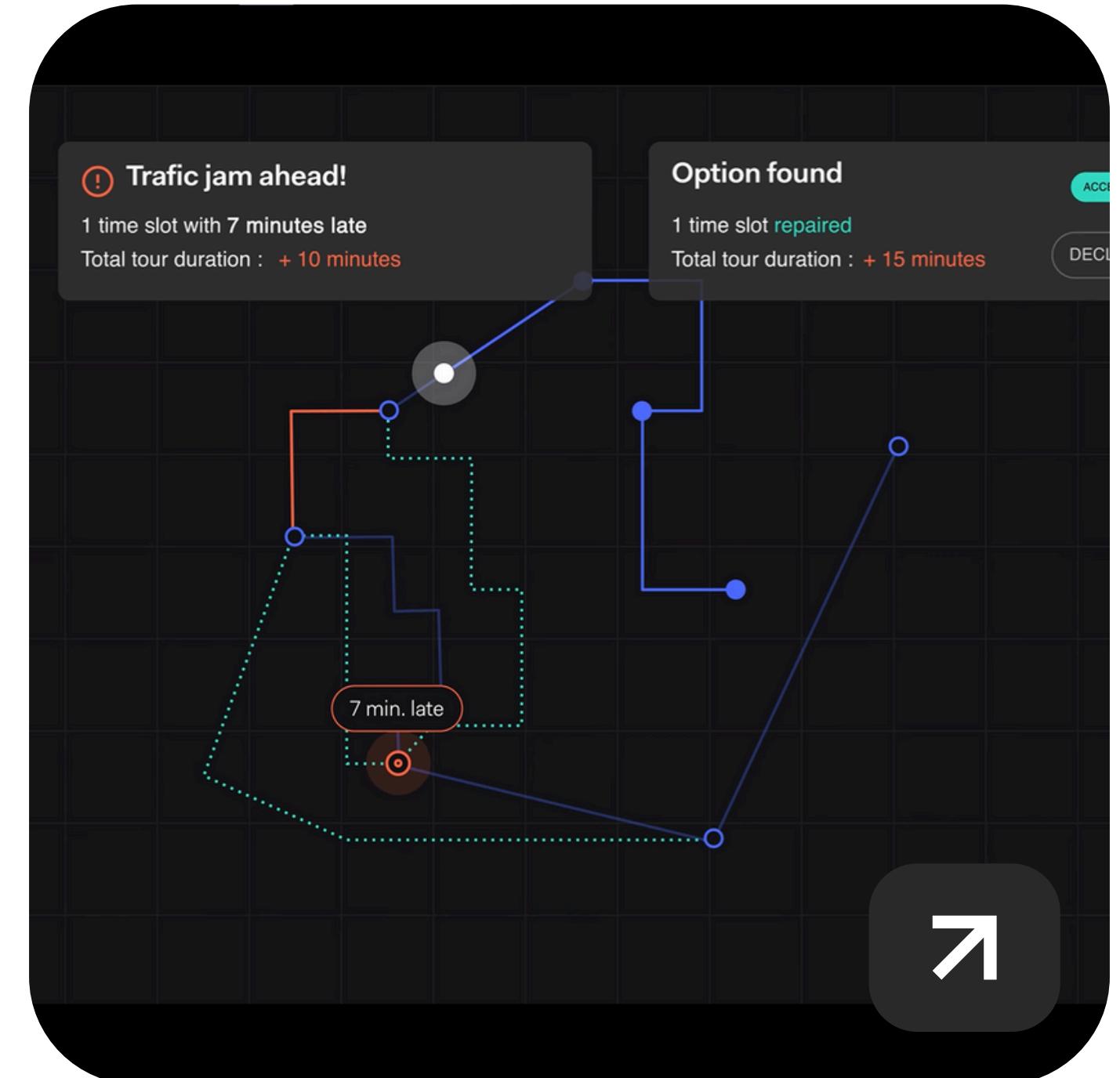
- 01 Objective
- 02 Existing Systems
- 03 Possible Solution
- 04 Proposed System
- 05 Benefits
- 06 Architecture Diagram
- 07 Gantt Chart
- 08 Literature Survey

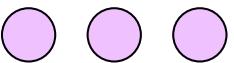




# Objective

The primary goal is to optimize the utilization of college buses by using real-time biometric data to ensure all students have a seat and buses are not overcrowded. The system will automate attendance tracking as students board the bus, dynamically reallocate students to nearby buses if capacity is exceeded, and combine buses with fewer students at strategic points. Ensure that all processes, from attendance tracking to bus reallocation and combination, are executed swiftly to maintain on-time schedules and safe travel conditions for all students. ...





# Existing Systems

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The current bus management system relies heavily on manual intervention from transport coordinators, who must monitor bus capacities and call bus drivers to make adjustments when issues like overcrowding or underutilization arise. This process is time-consuming, prone to human error, and often leads to delays and inefficiencies.

## Attendance

- Student's attendance is recorded manually through non-integrated systems, leading to inaccuracies and delays in data processing.

## Static bus routes

- Buses follow pre-determined routes without considering real-time data, leading to inefficiencies such as overcrowded or underutilized buses.

## Delayed Response Times

- Any need for reallocating students or combining buses requires direct communication between coordinators and drivers, causing delays and potential disruption in the bus schedule.



# Solution

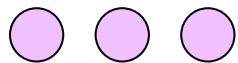
Implementing a system that automates bus allocation through real-time biometric data will significantly reduce the need for manual intervention. This system will monitor bus capacity continuously, automatically reallocating students to nearby buses with available seats when necessary. If certain buses are underutilized, the system will identify opportunities to combine them at strategic points for optimizing resource use.



### RIT Bus Portal

The map displays the city of Chennai with various bus routes marked by blue lines. Numerous bus stops are indicated by icons of buses along these routes. Key locations labeled include Veppambaattu, Pattabiram, Avadi, Anna Nagar, Koyambedu, T. Nagar, Marina Beach, and N4 Beach. Roads are labeled with numbers like 716, 205, 112, 48, 368, 113, and 1026. Temples and landmarks like Arulmigu Ennai Petra Thayaar samedha... and Arulmigu Devi Karumariamman are also marked.

Bus ID	Nearby Bus Seat Capacity	Nearby Bus Attendance	Action	Message	Location	Admin Action
1	50	28	Reallocation	Reallocate students from Bus 1 to Bus 9.	Current Bus: Near Chembarambakkam Lake, Nearby Bus: Chembarambakkam Junction	<input type="button" value="Accept"/> <input type="button" value="Deny"/>
2	50	25	Combination	Combine Bus 3 with Bus 7.	Current Bus: Porur Junction, Nearby Bus: Porur (Arcot Road)	<input type="button" value="Accept"/> <input type="button" value="Deny"/>
3	50	30	Combination	Combine Bus 4 with Bus 11.	Current Bus: Ramapuram, Nearby Bus: Porur Lake West	<input type="button" value="Accept"/> <input type="button" value="Deny"/>
4	50	13	Reallocation	Reallocate students from Bus 10 to Bus 4.	Current Bus: Guindy Kathipara Flyover, Nearby Bus: Ramapuram	<input type="button" value="Accept"/> <input type="button" value="Deny"/>



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# Proposed System

The proposed system translates the conceptual strategies into a tangible, functioning application with the following specific components:

## Biometric Attendance Collection:

- Real-time attendance is captured as students board the bus, with data automatically transmitted to the central application in Excel file.

## Real-Time Bus Capacity Monitoring:

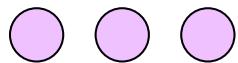
- Continuous monitoring of each bus's seating capacity, with the system set to trigger alerts and actions when thresholds are crossed.

## Dynamic Seat Reallocation:

- If a bus is over capacity, the system identifies nearby buses with available seats, sends a reallocation request to the admin, and upon approval, notifies the relevant bus drivers.

## Bus Combination Logic:

- The system detects underutilized buses and suggests combining them at strategic points. Admins approve these combinations, and drivers are notified to adjust their routes accordingly.



# Benefits

The following benefits collectively lead to a more organized, safe, and efficient transportation system for the college

## Improved Safety

# 1

Ensures that buses are not overcrowded and that every student has a seat, minimizing risks.

## Cost Savings

# 2

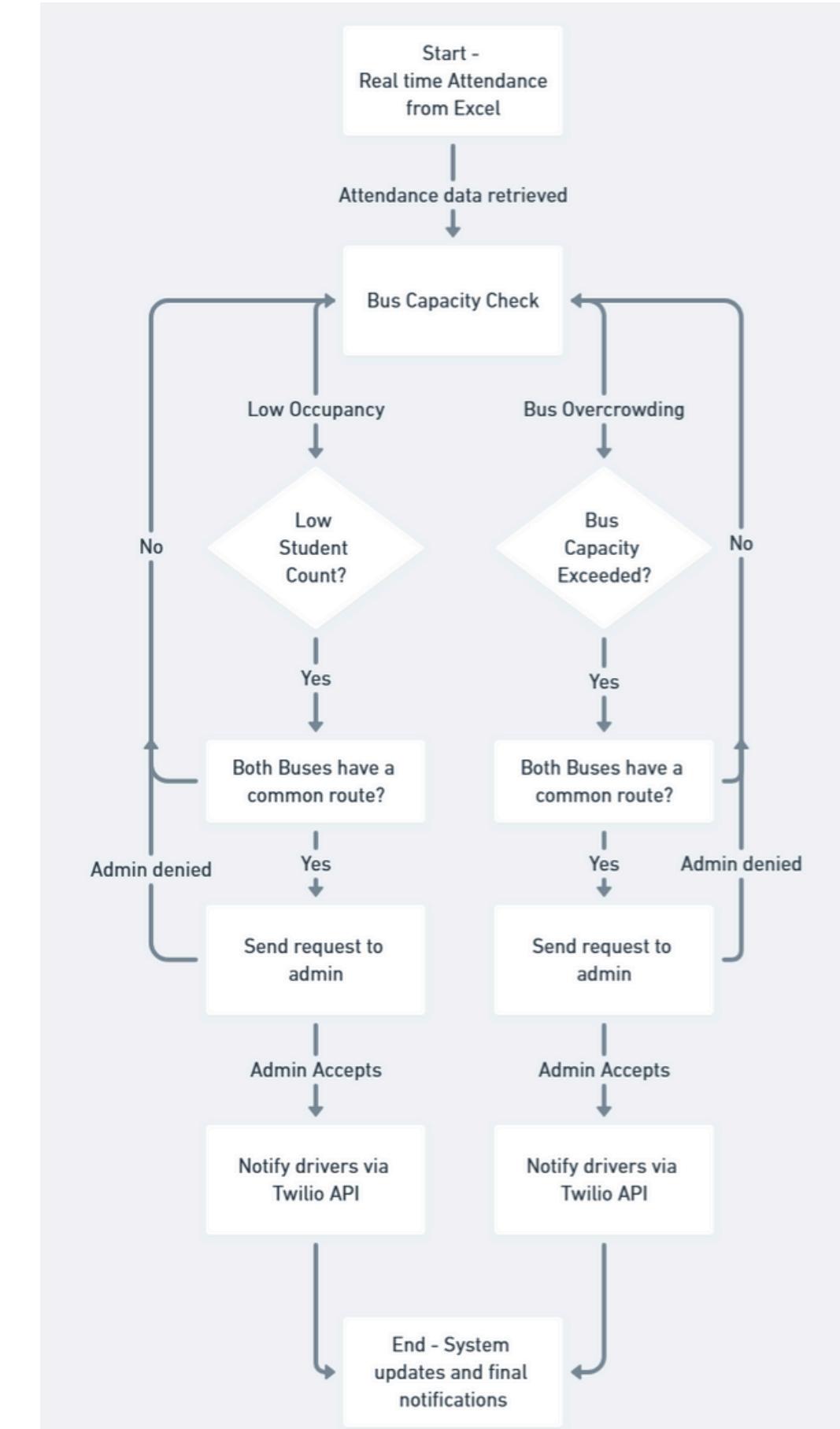
Dynamically reallocates students and combines underutilized buses, reducing operational costs and maximizing bus usage.

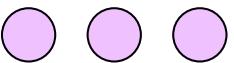
## Communication

# 3

Provides instant notifications to admins and drivers, ensuring coordinated and swift decision-making.

# Architecture Diagram





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# Literature Survey

This literature survey explores adaptive route optimization systems for fleet vehicles that use real-time traffic data. The survey covers methodologies, data sources, case studies, applications, and challenges, summarizing findings from:

[https://www.researchgate.net/publication/220109199\\_Optimal\\_Vehicle\\_Routing\\_With\\_Real-Time\\_Traffic\\_Information](https://www.researchgate.net/publication/220109199_Optimal_Vehicle_Routing_With_Real-Time_Traffic_Information)

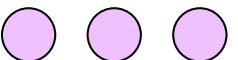
<https://kardinal.ai/what-use-of-traffic-data-for-realistic-and-efficient-route-optimization/>

<https://www.mdpi.com/2076-3417/13/20/11517>

<https://fareye.com/resources/blogs/what-is-fleet-routing>

[https://www.researchgate.net/publication/271191935\\_Route\\_Planning\\_with\\_Real-Time\\_Traffic\\_Predictions](https://www.researchgate.net/publication/271191935_Route_Planning_with_Real-Time_Traffic_Predictions)

<https://developer.tomtom.com/blog/decoded/how-location-apis-can-help-power-fleet-management-software/>



# Conclusion

The proposed real-time, biometric-driven bus management system will transform college transportation by enhancing efficiency, safety, and operational effectiveness. By automating attendance tracking, dynamic seat reallocation, and bus combinations, the system reduces manual intervention and ensures optimal resource utilization. This solution ensures all students have a seat, prevents overcrowding, and enables faster, more reliable transport operations, ultimately providing a safer and more cost-effective transportation experience for the college.

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