Green University of Bangladesh

Department of Computer Science and Engineering (CSE)
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GUB Transport Tracking System

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Lab Project Status	
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Comments:	**Date:**

Contents

Chapter 1

Introduction

1.1 Overview

The GUB Transport Tracking System is a project that aims to develop a comprehensive tracking system for the transportation services provided by Green University of Bangladesh (GUB). This system will allow users to track the real-time location of university buses and other vehicles, providing a convenient and efficient way to plan their transportation within the university campus.

1.2 Motivation

The motivation behind choosing this project is to address the challenges faced by students, faculty, and staff in navigating the GUB campus and accessing transportation services. Currently, there is a lack of real-time information about the location and availability of university buses, leading to inefficiencies and inconvenience for users. By developing a transport tracking system, these issues can be mitigated, providing a more seamless and user-friendly experience for everyone.

1.3 Design Goals/Objectives

The primary goal of the GUB Transport Tracking System is to provide an efficient and user-friendly solution for tracking university buses and other vehicles. The specific objectives of the project include:

- Real-time tracking of vehicle locations within the GUB campus
- User-friendly mobile application for accessing tracking information
- Integration with existing university systems and infrastructure
- Reliable and secure data storage and communication
- Customizable features and settings for different user roles

1.4 Application

The GUB Transport Tracking System has various applications in the real world. Some potential applications include:

1.4.1 Enhanced Transportation Experience

Students, faculty, and staff can benefit from accurate and up-to-date information about the location and availability of university buses, leading to a more convenient and efficient transportation experience within the campus.

1.4.2 Emergency Response and Safety

In emergency situations, such as accidents or natural disasters, the transport tracking system can assist in locating and coordinating university vehicles for evacuation or other emergency response efforts.

1.4.3 Data Analysis and Planning

The collected tracking data can be analyzed to identify transportation patterns, peak hours, and popular destinations, helping the university in planning future transportation services and infrastructure.

Chapter 2

Requirement Specification and SDLC Model Selection

2.1 Requirement Specification

This section describes the specific requirements of the GUB Transport Tracking System. It includes functional and non-functional requirements that define the system's behavior, features, and performance.

2.1.1 Functional Requirements

The functional requirements outline the specific functionalities and features of the transport tracking system. These requirements define what the system should do to meet the needs of its users.

Functional Requirement 1: Tracking of Vehicle Locations

The system should provide real-time tracking of university buses and other vehicles within the GUB campus. Users should be able to see the current location of the vehicles on a map interface.

Functional Requirement 2: User Authentication

The system should support user authentication to ensure that only authorized individuals can access the tracking information. Different user roles, such as students, faculty, and staff, may have different levels of access and permissions.

Functional Requirement 3: Route Planning

The system should allow users to plan their transportation by providing information about bus routes, schedules, and estimated arrival times at different stops.

2.1.2 Non-Functional Requirements

The non-functional requirements specify the system's quality attributes, such as performance, security, and usability. These requirements define how well the system should perform its functions.

Non-Functional Requirement 1: Performance

The system should be able to handle a large number of concurrent users and provide real-time tracking updates without significant delays or performance issues.

Non-Functional Requirement 2: Security

The system should ensure the security and privacy of user data. It should implement appropriate measures to protect user information from unauthorized access or manipulation.

Non-Functional Requirement 3: Usability

The system should have a user-friendly interface that is easy to navigate and understand. It should provide clear instructions and feedback to users, making the tracking process intuitive and straightforward.

2.2 SDLC Model Selection

The selection of an appropriate Software Development Life Cycle (SDLC) model is crucial for the successful development and implementation of the GUB Transport Tracking System. Different SDLC models have their strengths and weaknesses, and the choice depends on various factors, including project requirements, team size, timeline, and customer collaboration.

After considering these factors, the Agile SDLC model is selected for this project. The Agile model emphasizes flexibility, adaptability, and customer collaboration throughout the development process. It allows for iterative and incremental development, which is well-suited for projects with evolving requirements and a need for continuous feedback and improvement.

The Agile model will enable the development team to work closely with stakeholders, gather feedback early and frequently, and make necessary adjustments to meet changing requirements. It promotes regular communication, teamwork, and a focus on delivering a working product incrementally.

By using the Agile model, the project can benefit from increased transparency, faster feedback loops, and the ability to adapt to emerging needs and priorities. It aligns well with the dynamic nature of the GUB Transport Tracking System project and facilitates effective collaboration between the development team and stakeholders.

Chapter 3

Project Design Implementation

3.1 Data Flow Diagram

Data Flow Diagram (DFD) is a graphical representation of the flow of data within a system. It helps visualize how data moves between different components and processes. In this section, we will present three levels of DFD: Level 0, Level 1, and Level 2.

3.1.1 DFD Level 0

DFD Level 0 provides an overview of the system, showing the high-level processes and the flow of data between them. It represents the system as a single process and illustrates the interactions between external entities and the system.

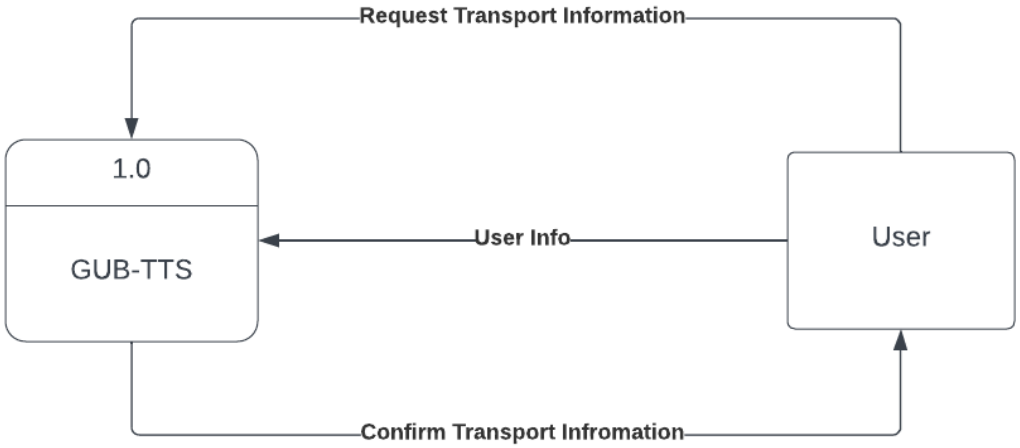

Figure 3.1: DFD Level 0

3.1.2 DFD Level 1

DFD Level 1 delves deeper into the system and decomposes the processes from Level 0 into more detailed subprocesses. It illustrates the flow of data between these subprocesses and how they contribute to the overall system functionality.

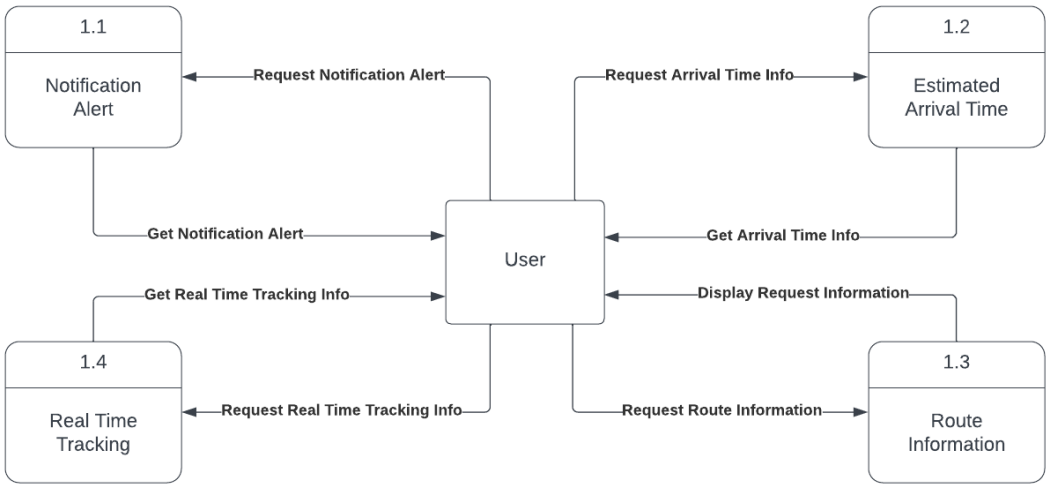

Figure 3.2: DFD Level 1

3.1.3 DFD Level 2

DFD Level 2 further decomposes the subprocesses from Level 1, providing a more detailed view of the system's internal processes and data flow. It breaks down the processes into smaller components.

3.2 UML Use Case Diagram

Use Case Diagrams in UML are used to illustrate the interactions between actors (users or external systems) and the system under consideration. This section presents the Use Case Diagram for the GUB Transport Tracking System.

3.3 UML Sequence Diagram

Sequence Diagrams in UML depict the interactions between objects over time. They show the order of messages exchanged between objects and highlight the collaboration between different components of the system. This section presents the Sequence Diagram for a specific scenario in the GUB Transport Tracking System.

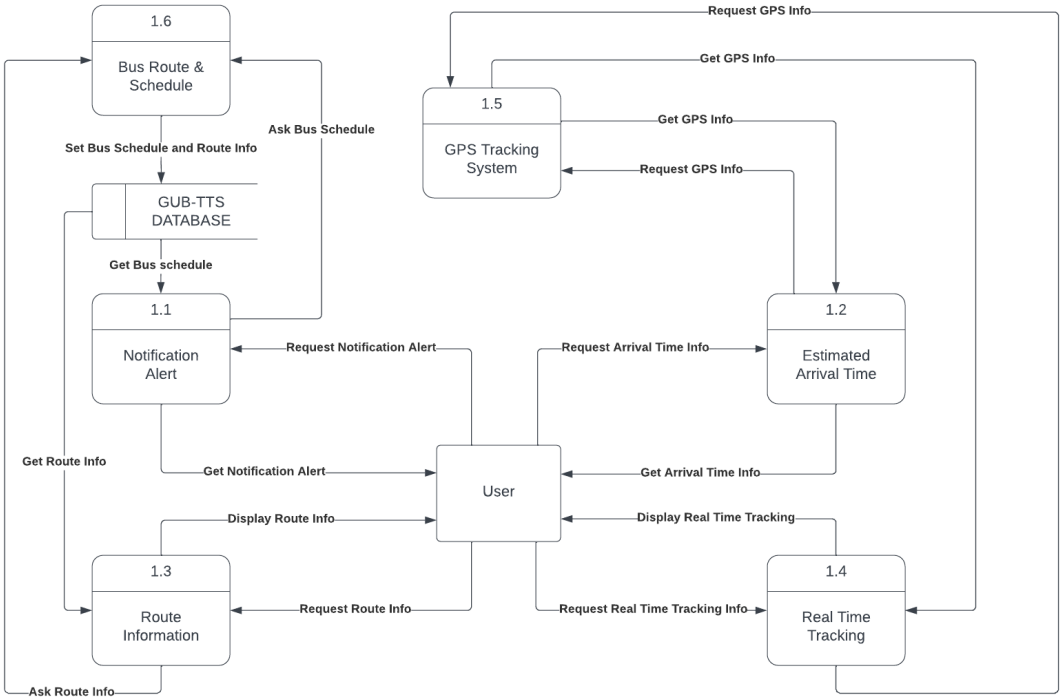

Figure 3.3: DFD Level 2

3.4 Class Diagram

Class Diagrams in UML represent the static structure of a system, showcasing the classes, their attributes, methods, and the relationships between them. This section presents the Class Diagram for the GUB Transport Tracking System.

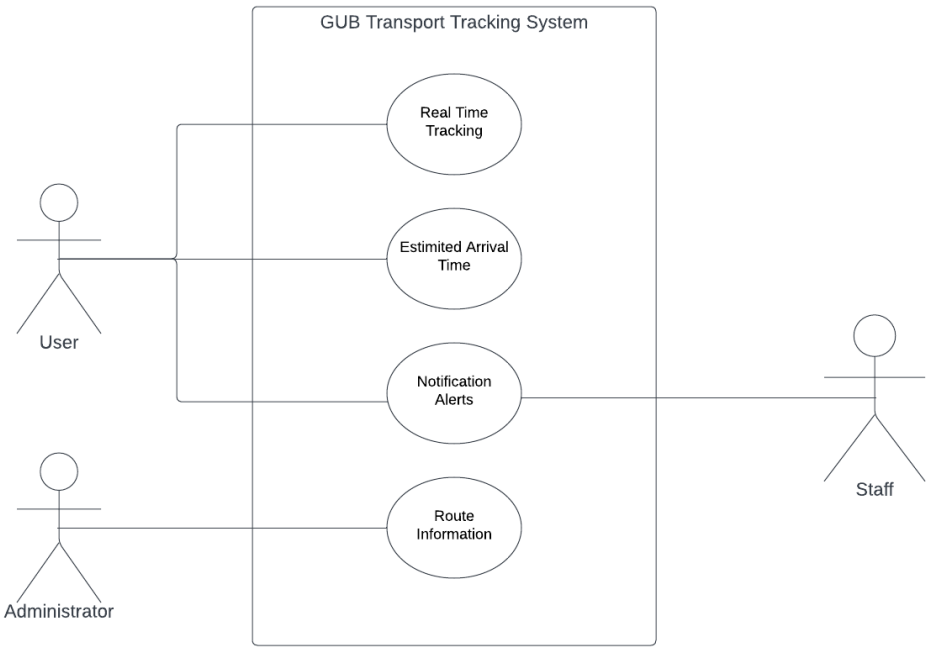

Figure 3.4: UML Use Case Diagram

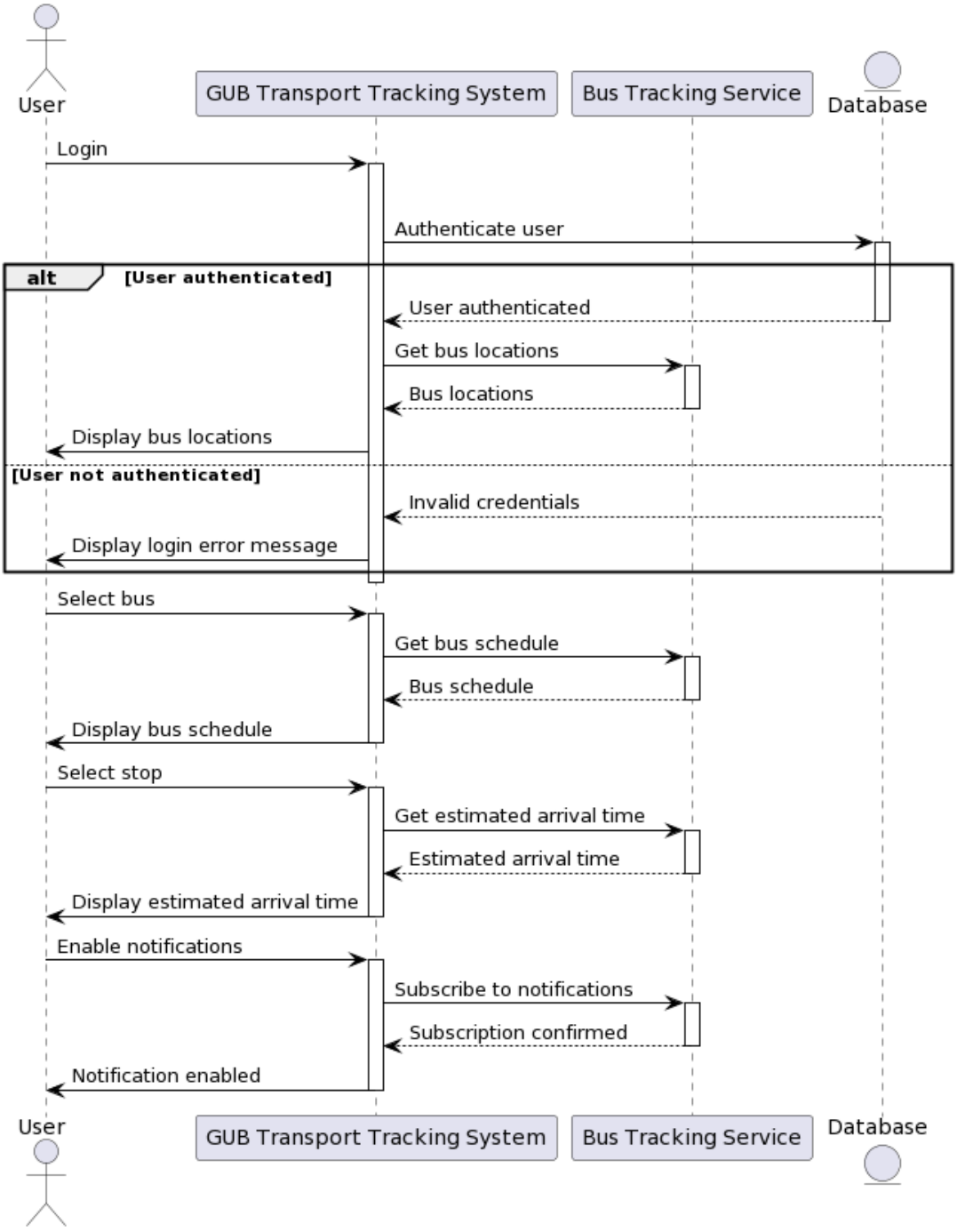

Figure 3.5: UML Sequence Diagram

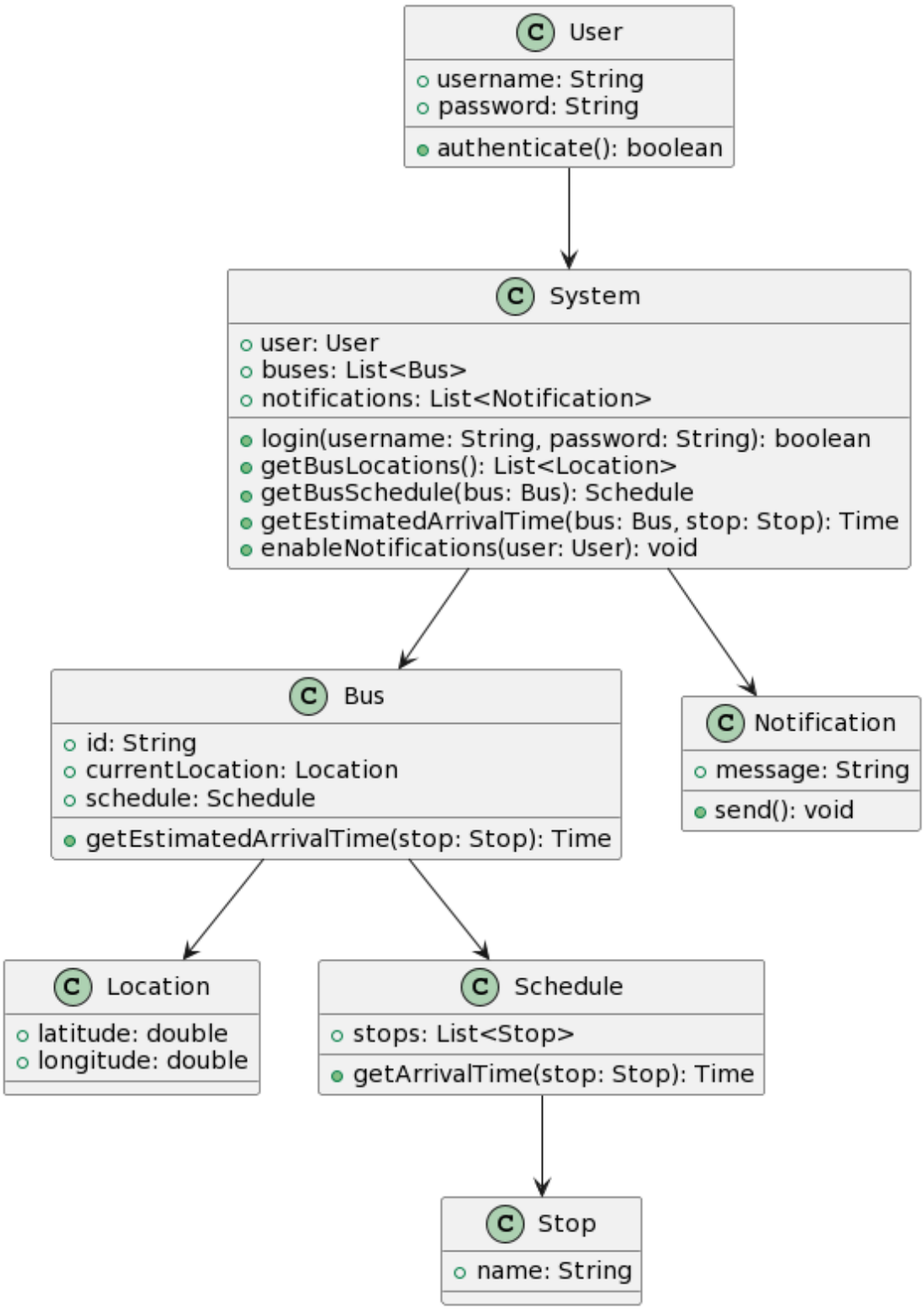

Figure 3.6: Class Diagram

Chapter 4

Conclusion

4.1 Discussion

The GUB Transport Tracking System is designed to address the challenges of navigating the Green University of Bangladesh (GUB) campus by providing real-time tracking of university buses. This system improves transportation efficiency, enhances resource management, contributes to emergency response and safety, and enables data-driven planning. Developing this system requires expertise in GPS technology, mobile app development, and server infrastructure, as well as balancing conflicting stakeholder requirements. Overall, the GUB Transport Tracking System offers a user-friendly solution to optimize transportation within the GUB campus.

4.2 Limitations

The GUB Transport Tracking System has limitations that include the resource-intensive infrastructure requirements, potential disruptions due to poor network connectivity, the need for user adoption and familiarity, privacy and data security concerns, reliability issues, scalability challenges, integration complexities with existing systems, and dependency on GPS signals. Addressing these limitations will be crucial for the effective implementation and management of the system.

4.3 Scope of Future Work

GUB Transport Tracking System includes enhancing the user interface and user experience of the mobile application, implementing additional features such as estimated arrival times and trip planning, conducting user surveys and feedback analysis to further refine the system based on user needs, expanding the system to support a larger fleet of vehicles and multiple campuses, exploring the use of advanced technologies like artificial intelligence and machine learning for predictive analysis and optimization, and continuously monitoring and improving the system's performance and reliability through regular updates and maintenance.