“Requirements and user stories for school bus tracking “

1. ***School staff member:***

**User Stories for a School Staff Member:**

* **As a school staff member**, I want to login in so that I can monitor the bus tracking and any updates.
* **As a school staff member**, I want summarized information for each bus so that I can manage the route of the bus.
* **As a school staff member**, I want information about each student so that I can organize the attendance and tracking operation.
* **As a school staff member,** I want to receive alerts for unexpected deviations or any updates so that I can handle and edit it.
* **As a school staff member**, I want to communicate with the bus driver so that I can talk to or notify him of any changes.
* **As a school staff member**, I want a list of students who will come the next day and who won’t so that I can set the route the driver will take.

* **As a school staff member**, I want parents to be able to contact me for any help.
* **As a school staff member,** I want to receive any change from parents so that I can automatically update the route of the bus.

**Technical Requirements for School Staff Member:**

1. **Functional Requirements:**
2. **User Authentication:**
   * **Requirement:** Implement a secure login mechanism for staff members.
   * **Requirement:** Ensure role-based access control to restrict unauthorized access.
3. **Dashboard and Notifications:**
   * **Requirement:** Design an intuitive dashboard for staff members.
   * **Requirement:** Implement a notification system for real-time updates and alerts.
4. **Communication Features:**
   * **Requirement:** Integrate a messaging system for staff communication within the tracking system.
   * **Requirement:** Provide a user-friendly interface for sending and receiving messages.
5. **Emergency Handling:**
   * **Requirement:** Implement an emergency notification system with clear protocols.
   * **Requirement:** Ensure staff members can easily trigger emergency alerts when necessary.
6. **Database:**

* **Requirement**: Set up a secure and scalable database to store student information and tracking data.

1. **GPS Integration**:

* **Requirement**: Implement GPS tracking functionality for school buses and individual students.

1. **Route Planning:**
   * + **Requirement:** Capability to define and manage bus routes from students' homes to school.
     + **Requirement:** Option to update routes based on changes or specific events.
2. **Real-Time Tracking:**
   * **Requirement:** Display a real-time map showing the current location of school buses or students on their way to school**.**
   * **Requirement:** Provide updates on estimated arrival times.
3. ***Non-Functional Requirements:***
4. **Performance:**
   * The system should respond promptly to user requests, ensuring a smooth and efficient experience.
   * Handle a specific number of simultaneous users without performance degradation.
5. **Security:**
   * Implement secure authentication and authorization mechanisms.
   * Encrypt sensitive data, including student information and communication logs.
6. **Reliability:**
   * Ensure high availability of the tracking system, minimizing downtime.
   * Implement regular backups and recovery procedures for data protection.
7. **Scalability:**
   * Design the system to handle an increasing number of students and buses as the school grows.
   * Scalability to accommodate additional features and functionalities in the future.
8. **Usability:**
   * Design an intuitive and user-friendly interface for school staff members.
   * Provide training materials or sessions for staff to familiarize themselves with the system.
9. **Accessibility:**
   * Design the system to be accessible to users with disabilities.
   * Compatibility with common web browsers and devices.
10. ***Bus Driver*:**

**User Stories for a Bus Driver:**

1-As a driver, I want to login to the application So that I can securely access on the application.

2-As a driver, I want to create and manage my profile information So that I can update my personal details for identification and communication purposes

3-As a driver, I want a dashboard after login displaying my assigned bus route So that I can quickly view the planned stops, timings, and details relevant to my driving tasks.

4-As a driver, I want access to a map interface displaying the real-time location So that I can ensure timely pickups and drop-offs.

5-As a driver, I want to receive route updates provided by the parent through the application So that I can stay informed about any updates regarding the assigned route.

6-As a driver, I want to send automated notifications to parents for each pickup and drop-off of the bus So that parents stay informed about their child's safe arrival at school or home.

7-As a driver, I want to log out securely from the application after completing my tasks So that I can ensure the security of the application and prevent unauthorized access to sensitive information when not in use.

**Technical Requirements for Bus Driver:**

1. **Functional Requirements:**

**User Authentication and Profile:**

Drivers can register and log in using unique credentials to access their personalized profiles.

**Route Information:**

Accessible dashboard displaying assigned routes, stops, timings, and instructions.

**Real-Time Tracking:**

Map interface indicating the real-time location of the assigned bus and live movement.

**Communication:**

Ability to receive updates or notifications from the parent regarding route changes or emergencies.

1. **Non-Functional Requirements:**

**Security:**

Secure login/logout functionality ensuring driver authentication and protection of data.

**Performance:**

Real-time updates with minimal latency for accurate bus location tracking.

**Usability:**

Intuitive user interface facilitating easy navigation and access to critical information.

1. **Business Requirements:**

**Parent Communication:**

Ability to notify parents/guardians upon pickups and drop-offs for child safety and updates.

**Efficient Operations:**

Optimizing routes and adhering to schedules for efficient bus operations.

1. **Technical Requirements:**

**GPS Integration:**

Integration of GPS technology to track and display the live location of the bus accurately.

**Notifications System:**

Implementation of a robust system for automated notifications to parents/guardians.

**3-*Parents:***

User stories for Parents:

1. **As a parent**

I want to creat an account and log in easly

So that I can follow up the bus movement easly

1. **As a parent**

I want to inform the bus if my child is not going to school

So that the bus will not come to my residential area

1. **As a parent**

I want to notifying me when my child gets on the bus to and from school

So th As a parent at I feel reassured about my child

1. **As a Parent**

I want the ability to set specific notifications for bus arrivals and departures,\*\*

so that I can plan my child's schedule and be prepared for their arrival home.

1. **As a Parent**,

I want to receive real-time updates on any delays or disruptions in the school bus schedule,

so that I am informed about any changes in the planned route or timing.

1. **As a Parent**,

-I want a user-friendly interface that allows me to easily navigate and visualize the bus route,

so that I have a seamless experience monitoring my child's daily commute***.***

**Technical Requirements for Parents:**

1. **Functional Requirements:**

**1. Real-Time Tracking:**

- The system must provide real-time tracking of school buses, allowing parents and school administrators to monitor their locations.

**2. Notifications:**

- Parents should receive notifications for bus arrivals and departures, as well as any delays or disruptions in the schedule.

**3. Communication Platform:**

- The system should include a communication platform that enables parents to interact with the school administration and bus drivers in case of emergencies or changes in plans.

**4. Attendance Management:**

**-** The system must generate reports on the number of students present and absent on each trip, aiding the school in managing attendance records.

**5. Customizable Alerts:**

- Parents should have the ability to customize notification settings, allowing them to set preferences for specific alerts related to their child's bus movements.

1. **Non-Functional Requirements:**

**1. Performance:**

- The system should provide quick and responsive real-time tracking, ensuring minimal latency in updating bus locations.

**2. Scalability:**

- The system should be scalable to accommodate an increasing number of buses and users as the school expands.

**3. Reliability:**

- The system must be reliable, with a high level of uptime to ensure continuous monitoring and communication.

**4. Security:**

**-** Data transmission between the system, buses, and users should be encrypted to ensure the security and privacy of sensitive information.

**5. Usability:**

- The user interface should be intuitive and user-friendly, catering to users with varying levels of technical expertise.

**6. Compatibility:**

- The system should be compatible with a range of devices and platforms to ensure accessibility for both parents and school administrators.