**PROPOSED SYSTEM**

1. **Architecture Model and Flow Description**

The core of this research is to implement an intelligent system for tracking school buses. It should ease the work of the school authorities by making the system automated. The overall flow is explained.

A mobile application is used for giving parents/guardians a real-time update on the status of their children. This application is implemented in Android. The application facilitates the tracking the live location of the bus, taking the attendance of the children entering and leaving the bus, sending alerts to authorities and parents in case of emergencies and giving an estimated time of arrival. Real-time location is tracked using Google Maps API on smartphones.

For the bus conductor and/or staff, the application is used to take the attendance of the children present on the bus with the help of QR code. This information is dispatched to the school server. Similarly, the drop status is also recorded using the code scan. The bus conductors have an emergency button on the application, which can be used during extreme emergencies to alert the authorities via the web portal and the parents via the mobile application.

A web application is maintained for the school authorities to view the status of the bus and maintain the database of the students, parents and bus drivers information. MySQL database is maintained to store this information. The updates are sent from the conductor’s phone to the Django server via REST APIs and stored in the database. By the web portal, school bus authorities can simply keep a check on the status of the bus and be alert in case of emergencies. The forecast for bus delays due to traffic is viewed on the website by the authorities to schedule the departure of buses to avoid tardiness.

The mobile application can be accessed as a parent or a bus conductor as shown in Figure. 1. The credentials are exclusively provided to them by the school. A parent can log in as a parent to check his child/children’s status when boarding or departing the bus. A profile will be maintained for the user to edit any information of the children which will be reflected in the database. The live location is available is visible to parents at all times and estimated time is shown on the application based on traffic congestion, etc. These details are also fetched via REST APIs from the Django server after they have been transmitted to the server from the conductor’s phone.

The technical requirements that should be considered while using the system are:

• Smartphone must allow access to GPS sensors and Camera

• Data collection from QR Code should happen in real-time

• Alerts to conductors, school authorities and guardians require internet connectivity