

# Student Safety and Security Solution by Tracking a Bus Based on Web Application

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**Abstract:** The main Objective of the System is to tracking a school bus is a matter of caring for child safety whilst on their daily journeys to and from school, as well as on school excursions and trips. MyBusTracker's moral is a safety and security conscious parents and schools and our tracking solution is the answer that provides both comfort and peace of mind. The admin and parent can be easily track the school bus by using GPS Tracking Device.

**Keywords:** Students Safety, Live Tracking, Web Application.

## 1. INTRODUCTION

MyBusTracker provides a quick and secure way to track the location of all school vehicles that ferry students to and from the school. This is often called "Student Safety and Security Solution". A companion app for real-time tracking and monitoring of buses enabled with the MyBusTracker .live system. Users will need to be invited to log in to the app by a linked school or organization. See real-time updates for the bus, its estimated time of arrival and delays if any. Be formed of the arrival time by push notification as it arrives near you. Inform the bus driver and attendant about your trip cancellations and stop changes.

MyBusTracker has two types of applications.

1. Web Application (Admin UI)
2. Mobile Application

MyBusTracker mobile application that helps to connects parents with their child school transport system, enabling them to locate and find their child and a school bus at any given moment during their school bus route.

MyBusTracker has two types of Mobile Applications.

1. Staff App
2. Parent App

MyBusTracker has provided students safety, give a secure and quick solution. MyBusTracker gives several parts such as Web Application (Admin UI), Parent App and Staff App.

The school admin and parents both are can easily to track and monitor our school bus operations and Real-time monitoring and get notification using Web Application(Admin UI), Parent App and Staff App. MyBusTracker Web Application (Admin UI) that is used for to handle and monitoring overall like Vehicle Management, User Management, Staff Management, Handle and Monitoring Notifications, Route Management, Trips Allocation and Management.

## 2. EXISTING SYSTEM

The existing system was developed in AngularJS. It was one of the Javascript front-end frameworks. It time taking, difficult to achieve simple parts and loads more time. The Dependency of AngularJS very complicated.

### Drawbacks

- Time taking and hard to achieve simple components.
- Make Back-end request is very hard in JS Framework.
- Managing scopes and directives is hard in AngularJS.

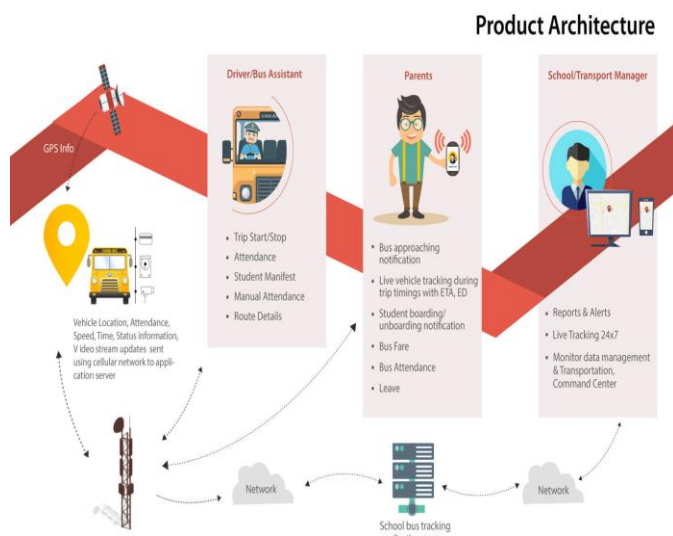
## 3. PROPOSED SYSTEM

To overcome the drawbacks of an existing system, the proposed system has been evolved. This system is developed in Angular 5. It is the latest version of Angular 2. The difference is AngularJS is using Javascript and Angular uses Typescript. Typescript is the Superscript of ECMA Script 2015. So it is fast and reliable. Easy to develop and manage.

### Advantages

- Easy to develop a hard part of a component.
- Easy to reuse all component.
- Easy to create services for backend HTTP requests.
- Making superfast to load in Single page applications.
- The Angular CLI makes better to compile and run on the live server.

## Architecture:



## 4. MODULES

The main objective of developing "MyBusTracker Admin UI" is very useful for school admin/management because of overall controls and monitoring under the admin UI part.

The system comprises one Module.

### 1. Admin Module

#### Admin Module

Administrator's part is a very important part because they handle all maintenance and controls. Administrator works add the vehicles and map to the route and trip, create and maintains the routes, create and maintains the stops and create the users and allocate to the route.

#### Login

A login page is used to allow only valid users. Each and every school admin has a unique Email ID and password to a valid user only navigates to the school selector page.

#### Registration

A registration page is used to create or register a new school with the help of School Name, Fleet Name, Description, Contact Email ID, Contact Phone Number, Street, City, State, Zipcode, Country, Time Zone, Latitude, Longitude.

#### School Selector

School Selector works done by school admin because each admin has may be more than one school so the admin wants to choose the school to know about the school bus operations.

## Dashboard

A dashboard is a very first feature that is displayed on the screen comes after logging and school selected from the School Selector.

A dashboard is a holistic view of the status of all the buses is displayed. Admin can easily show a piece of information related to the buses status

- License Plate number of each bus.
  - Route took by each bus for the day.
  - Start and End time of the Trip.
  - Stops and a corresponding number of students as per the routes.
  - The path traversed by the bus if the trip is completed.
  - Live tracking location of the bus if the trip is in progress.
  - Distance travelled by each bus.
  - Maximum speed has taken by the bus during a particular trip.
  - For Convenience, 2 views of the Dashboard are provided.
- [4]. Map View: The location of all the buses are displayed on the map.
  - [5]. Timeline View: A listed view of all the buses and related parameters are displayed.
  - [6]. The timeline of the bus is indicated in various colors, the significance of which is described on the dashboard page (by clicking on help icon) and below as well:
  - [7]. Green: when the bus is delayed by less than 5 minutes relative to the expected ETA.
  - [8]. Yellow: When the bus is delayed by more than 5 minutes relative to the expected ETA.
  - [9]. Red: When the bus is delayed by more than 20 minutes relative to the expected ETA.
  - [10]. Grey: When the time of the bus in relation to the set Geo-Fences cannot be determined.

On clicking the License plate on the trip corresponding to a particular bus, both time view and map view of the bus and corresponding route along with the stop details and the respective time information are displayed.

## Vehicle Management

Vehicle Management is maintained by the School Transport Admin can make the entry of the vehicle details of respective buses that belongs to the school bus fleet. Vehicle Management has consisted of all corresponding school bus information.

## User Management

User Management is fully maintained by the School Admin. The School Admin can easily add the new students with the help of students details (Name, RollNo, Grade, Pickup Stop, Drop Stop, Pickup Route, Drop Route) and add their parent name and their any number

of phone contacts details of multiple parents/guardians (in case the parents have provided more than one contact number).

### **Route Management**

Route Management has consists of three parts

- Stop
- Route
- Route Planner

#### **Stop**

Stop section is the first part of Route Management. So first Admin should create the stops with the help of Stop details Name, Stop Type (Stop, Parking, WayPoint), Latitude and Longitude.

#### **Route**

Route section is the second part of Route Management. Admin can only create the routes with help of route details (Route Name, Route Type, Starting Points, Ending Points and lists of Stops) and allocate the route for each and every student. Each route has consisted of a lot of stops. Each school bus is travelled through its corresponding route.

#### **Route Planner**

Route Planner feature mostly helps for School Bus Administrators because school admin can show their routes more efficiently and with precision.

Router Planner is an option of Route management that option is provided to select the vehicle number, date and time of travel. With installed tracking devices, the school bus can take a trip through the route along the stops that are under consideration. After the trip is made, that particular school bus and the corresponding date and time the trip was made. A map view of the route taken and the locations where the bus had halted is displayed. The School Bus Administrator can now select the desired stops from this map view and save the locations as new stops. Upon selecting the location from the map, the exact location (Latitude and Longitude) details of the stop are captured, that helps to avoid errors that may be introduced while entering the location specifications manually.

### **Notification Management**

In Notification Management, An admin can only create a new notification and send a notification to the parents.

There are two types of notification.

- Announcement Notification
- NoShow Notification

#### **Announcement Notification**

This notification contents high prioritized message which is needed to be broadcast to all people based on a category it may be either by tags, trips and schools.

### **No Show Notification**

This notification is used to alert admin of the organization when any vehicle in this doesn't sync with our system for more than 10 minutes.

### **Staff Management**

Staff Management means to create and maintains the staff details by the school admin. The staff means both Driver and Attender. The school admin can show the driver's ratings and behaviors by the parents providing ratings for drivers. So the admin can easily know about the driver behaviors.

### **Settings**

Settings section is mostly used to update the details of school that includes School Name, Description, Address and Contact Details.

## **5. CONCLUSION**

"MyBusTracker Admin UI" is very effective and user-friendly for Admin management. Now the parents tracking a school bus is a quantity of caring for child safety although on their daily journeys to and from school. The System has been developed with care and it is error free. The System has been completed successfully which is customized for the user basis and developed with meticulous care. This system is used to maintain student's safety and prevent panic of their parents.

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