DTC BUS CAPACITY IN THE BUS AND BUS TRACKING SYSTEM

A major bus fleet of the DTC or Delhi Transport Corporation operates in the country and caters to the requirement of millions of customers. DTC bus systems have grown popular among the people, however, a few issues remain including, but not limited to, inefficient routing, no tracking available in real time, and system overloads. The purpose of this proposal is the introduction of a Smart Bus Tracking and Capacity Monitoring System to enhance transit systems and refine the commuter experience.

The system uses GPS to provide real time reports of bus location which in turn we have passenger counting sensors (like IR or weight sensors) to determine occupancy. We transmit this info to a central cloud which in turn updates the user's mobile app and what you see at bus stops. Commuters may track bus location, estimate time of arrival, and note present load which in turn will inform their travel choices. Also this data is used by transport authorities for route optimization, managing congestion and fleet management.

1. GPS – Tracking Bus Location

GPS (also known as Global Positioning System) is a technology which determines the precise location of any moving vehicle. In to put GPS devices in buses we are able to see in real time where each bus is going. This allows passengers to see how far the bus is from the stop and what the wait time will be. Also with this info transport authorities are able to improve their decisions. GPS tracking in turn makes the system as a whole more organized and predictable.

2. Internet of Things (IoT)

At present IoT brings out the interconnectivity of mobile apps, sensors, and GPS devices. Each of these devices transmits and receives data as a matter of course. For example a sensor that counts the number of passengers in a bus reports that info to a central server which in turn displays it on the related mobile app. IoT is key to the smooth running of the system also in that it provides up to date info to users and officials.

3. Passenger Counting Sensors

A,counting people on buses. Easing fare collection and speeding up boarding buses utilize a robust traffic control system on multi lane roads. There are several options available on weight, infrared, or cam based people counting sensors including: 1. Automated people counting infrared sensors, 2. Automated counting weight based people counting sensors, 3. Automotive counting cam based people counting sensors.

4. Mobile Apps and Digital Platforms

Mobile apps are a large part of today's technology and are very easy to use in what we do daily. In this case we have an app or website which is updated in real time for passengers which includes:.

● Bus location
● Estimated arrival time
● Passenger count or seat availability

The DTC bus tracking system is based on a sound dataset; failure to have high-quality information leads to the breakdown of the system. With this data effectively exploited, there is real time informational response, predictive analytics, and coherent visualisation across the network as a whole. In Delhi city, capital, messages, sent by each bus constantly make references to the geographic position of the bus, the path it is running and the number of passengers, inspection activities and exact stop position. Outside of these basic to provide the estimation of delays, areas of
congestion and the extrapolation of the trends by analyzing the travel using statistical methods.

1. Gathering and summary of data:

The data set is built by using a plethora of interdependent elements that aim at defining bus dynamics in action. One of these components documents the real time geographic position of each car and the other documents the number of passengers coming in and out. The data is sent in real time to a web based repository. The information then is quickly sorted out by automated systems that
allow real time verification, and the information is guaranteed to be up to date without any noticeable delay in its status. The backgrounds of data throughput are continuous.2

2. Bus Location Data:

The Bus Location Data module constantly monitors the location of all vehicles, and has its coordinates updated on intervalised epochs of time, which are usually between ten and fifteen seconds long, and in some setups, thirty seconds. It logs the real time geospatial coordinates and keeps the previous positions hence supporting retrospective analyses of the trajectory. Other mobility
properties, whose names are reception timestamps, cellular velocity in kilometres per hour, and azimuthal bearing, with north being 0 and east 90, are also recorded.

3. Passenger Count and Capacity Data:

The system enters sensor data in an effort to monitor the available capacity and this sensor is either infrared or ultrasonic sensors installed at areas of entry or on floors used to determine who enters or leaves the facility. Since the data is urgently needed, the system will be able to show the occupancy rates at specific times. Records include the vehicle identifier, time stamp and boardings and alighting
counts of passengers. These figures are then manipulated by the system to calculate prevailing occupancy by summing up boardings and minus alightings. It subsequently uses the aggregate ridership as a percentage of the seating capacity and treats all of the total occupancy as categorical levels (e.g., low, moderate, or high) so as to allow easy interpretation.