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RESEARCH ARTICLE OPEN ACCESS

Implement the Internet of Things-Based Smart Bus System

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Abstract:

In this research, we introduce a bus system that is kept stationary at the bus stop and a bus system that is kept at the bus and may efficiently assist the public in taking full advantage of bus transportation services. This passenger infotainment system recognizes a bus approaching the bus stand and displays information about that specific bus to the passenger at the bus stand. Bus location will be determined via GPS and announced in the bus this information is forwarded to the next bus stop for travellers. Utilizing radio frequency technology, the bus identification procedure announces bus details through voice and displays them on a liquid crystal display (LCD) device. The current research summary gives information on the combination of Microcontroller and Voice Announcement, GSM and GPS LCD display, and RF transceiver.

Keywords ***—Smart cities, accessible transportation, intelligent bus stops, mobility technologies, and connected public spaces.***

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I. INTRODUCTION

India needs a reliable bus transportation system. Uncertain congestion has resulted from population growth at public bus stops. Even when a bus that is not headed in the direction they are waiting for passes by, people will suddenly assemble near stops and wait for it for hours. This causes excessive congestion, which may be avoided by using this cleverly designed IOT-based bus transportation system. In order to improve vulnerable and disadvantaged populations' access to essential services as well as their social and professional interactions, public transportation is essential. For local, long- distance, and tourism transportation, specific policies, research goals, and suggestions have been defined. In order to improve vulnerable and disadvantaged populations' access to essential services as well as their social and professional interactions, public transportation is essential. For local, long-distance, and tourism transportation, specific policies, research goals, and suggestions have been defined.

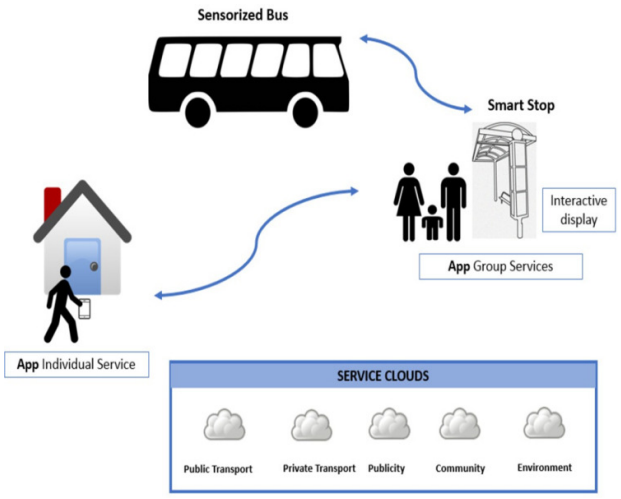

Fig 1:- Smart Development on Map

II. NEED OF STUDY :-

The most typical operating scenario in India is a bus operating in a mixed-traffic environment. Since mixed traffic operations expose buses to automotive traffic conditions and slow cars down to service passengers, they complicate capacity estimations for both bus and automobile flow. The bus facilities are determined by the operational process and the critical bus capacity. Urban development should accommodate bus stop operations and services. In our current state, effective bus stop planning and layouts are lacking. Currently, auto rickshaws and two-wheelers may drop off and pick up passengers at bus stops. Planning should be connected to urban expansion. The amenities as they are now should be improved by planning elements.

III. OBJECTIVES:-

1. To Evaluate The Current Amenities In A Few Selected Routes, As Well As The Activities Of Bus And Passenger Movements At Bus Stops.
2. Reviewing the position of bus stops along the chosen corridor in light of desirable planning criteria (accessibility) and assessing the bus stations' capacity in light of current and future bus operations and routes.

IV. LITERATURE REVIEW:-

Planning for Bus Stop Locations:-

Design of Bus Station Layout:-

Peter G. Furth et.al. (2020) The use of geographic information and computational resources offers the chance to do a better analysis of changes in bus stop placement or spacing. The impact of stop placement changes on walking, riding, and operational costs is the most significant and complicated. Because they made the assumptions of homogeneous demand density and clear walking pathways, traditional models and stop spacing design regulations predict walking impacts extremely roughly.

Mahmoud Taghizadeh et al.2010 They created an analytical process based on the roadway network and a parcel-level geographic database provided by a local government agency, such as the municipal tax assessor. The shortest path and Voronoi diagram methods were applied to the roadway network to determine the borders of stop service areas and walking paths. To disperse historic on / off counts, data on the land use and development intensity of each parcel were employed.

Khalid A. S. Al-Khateeb et al. 2011 had completed their task in providing accessibility and mobility to the end user is a fundamental duty of every transportation facility. Mobility is the ease with which a movement may be made, whereas accessibility often refers to the ability to be reached. In the past, accessibility was calculated based on how close individuals, locations, or services were to a transportation system.

Shwe Yi Aye 2013 Journey time, travel distance, or a generic travel cost function were all used to gauge proximity. The journeys that may hypothetically be undertaken between two sites based on some relative attractiveness metrics had also been estimated using transportation demand models using some measure of accessibility.

Visit Hirankitti et al.2016 Arrivals of passengers and buses at two London bus stops. This study addresses the issue of estimating the typical passenger waiting time by using bus data as well as taking into account long-term variations in the passenger arrival rate and the fact that it wasn't always possible for a passenger to board the first bus to arrive.

V. METHODOLOGY:-

Data Collection

The data collection process is divided into two parts

1. Primary Data
2. Secondary Data

Primary data collected from the following

a) Number of passengers

The number of passengers boarding and deplaning at each point within the research region will be tallied. The count information will be placed into a spreadsheet, where it will be routed, timed, and location-analyzed. A geographic information system was used to geocode the data and perform a geographical analysis.

b) Passenger waiting time

The value of waiting time at bus stops will be determined based on how passengers wait for buses and the kind of activities they participate in while they wait.

c) Spacing between bus stops

The performance of bus stops and the various types of buses are significantly impacted by bus stop spacing. Overall journey duration has an impact on stop demand as well as stop spacing. Bus stop spacing is typically determined by the kind of development, such as a central business district, a commercial sector, or a residential neighbourhood (CBD).

Secondary Data

The Highway Capacity Manual model 2000 will serve as the foundation for the bus stop model. The optimal plan will be determined by simulating bus movements, pedestrian movements, and passenger movements for several layouts. At this level, modeling and simulation of bus arrival, berthing at the bus stop, and pedestrian and passenger movement at the bus stop are also required. Verkehr in Stadten

- Simulation, a traffic simulation programmer, will be used to model and simulate bus stops (VISSIM).

VI. Conclusion:-

IoT may be used by many different application domains in a smart city to provide smart services. City bus services in smart cities were the primary focus of this investigation. The proposed SmartBus System (SBS) simulates a city-wise bus transportation system with the amenities needed for a smart city. The SBS's many components have been explored, as well as their connections, interactions with other systems, and use of online portals to compel citizen access. Designing a framework to combine heterogeneous sensor data with software modules for bus stop, driver's cabin, and central facility operators at bus depots is the natural next step in this effort. Aadhar database and central server interface for biometric authentication devices employing RFID and NFC technologies must also be taken into account.

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