

SMART TRAFFIC SIGNALS

1. INTRODUCTION -

1.1 Overview -

In order to reduce the traffic congestion and improve the public transport efficiency, infrastructures which enables smart transport services would be the key factor for the success of intelligent transportation systems. A Smart Traffic Signal Control system is designed and implemented to reduce noise and pollution, it supports several smart city transportation applications including emergency vehicle signal preemption, public transport signal priority, adaptive traffic signal control, eco-driving supporting, and message broadcasting. A smart-traffic control system that optimizes the flow of traffic at already signalized intersections through the integration of its proprietary software with existing traffic control machines.

1.2 Purpose -

A traffic signal controller, as the most important part of infrastructure in smart transportation, is the main coordinator for the urban traffic flows.

The smart traffic signal control technology are installed for a number of reasons. They include:

- To reduce the amount of time motorists spend on the road.
- Reduced vehicular emissions from stationary vehicles on roads.
- Reduce noise and pollution.
- To allow for more efficient use of road capacity by increasing throughput of vehicles through intersections.

Thus, the use of smart traffic signal in mitigating traffic congestion and vehicular emission issues present significant health and environmental benefits.

2.LITERATURE SURVEY -

2.1 - Existing Problem -

The population in the world has reached 7.8 billion and the size of the global population would stand between 8.5 and 8.6 billions in 2030. Population growth causes an increase in the number of vehicles, and a lack of effective traffic management would lead to huge economic loss such as energy consumption, greenhouse gas emissions. With the continuous population growth, traffic congestion has become one of the biggest obstacles restricting the city economic

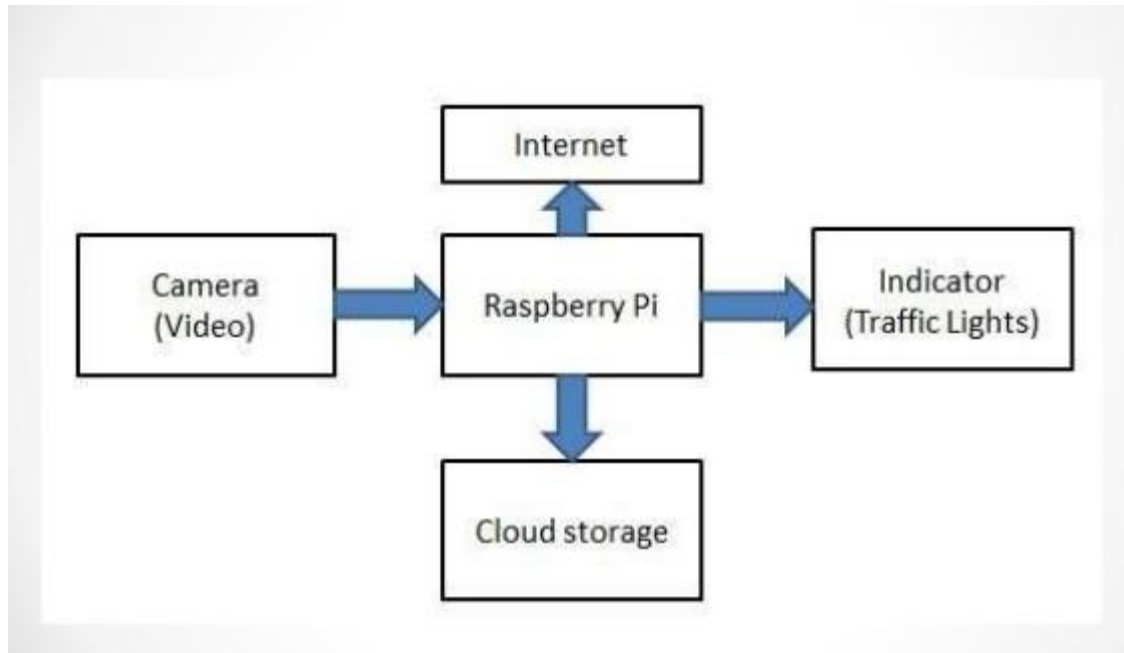
development, it results in high consumptions of fuel, increase the cost of commutes, and also pollutes the environment. In order to reduce the traffic congestion and improve the public transport efficiency, infrastructures which enable smart transport services would be the key factor for the success of intelligent transportation systems.

2.2 Proposed Solutions -

In working to resolve this problem, a solution has been designed to control the traffic signals that optimizes signal timings while allocation green time to different intersection phases based on vehicle presence, vehicle-count and flow through data collected by vehicle presence, noise or air quality index. The aim of smart traffic signals is to reduce the amount of time vehicles spend on roads while enabling an optimal use of road transport networks and reducing the pollution and noise.

3. THEORETICAL ANALYSIS -

3.1 Block Diagram -



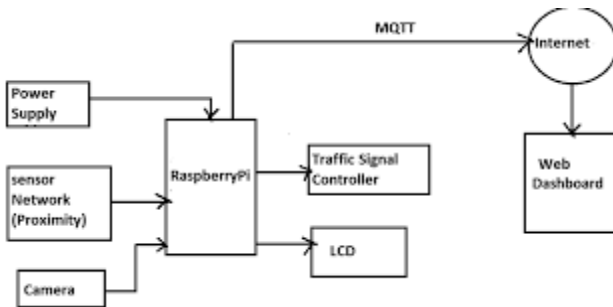
3.2 Hardware/Software Designing -

The hardware part of the project involves the Raspberrypi model. The sensor values are sent to the IBM cloud services using the Pi's Wifi module. The data is sent to the mobile application which is developed using MIT app Inventor. Here, we use python language for coding. Node-red etc... software tools are used.

4. EXPERIMENTAL INVESTIGATIONS -

There are several IOT authentication challenges and issues that need to be understood before employing the right security solution that can dynamically vary with the situation. Based on certain critical situations such as smart traffic signal control applications, frequent authorization and authentication are necessary and could dynamically vary and potentially result in changes to the authorization of the IOT device.

5. FLOWCHART -



6.RESULT -

Adopting this technique would help provide the opportunity to increase engagement with their technology while providing cities that have opted to deploy their significant benefits in reduced traffic congestion, reducing pollution and noise.

7.ADVANTAGES AND DIS-ADVANTAGES -

- Advantages -
 - a. Smart Traffic Signals provide for an orderly movement of traffic.
 - b. They provide authority to the drivers to move with confidence.
 - c. They help in reducing the frequency of an accident.
 - d. They control the speed of vehicles on main as well as on secondary roads.
- Dis-advantages -
 - a. Smart Traffic Signals may result in a re-entrant collision of vehicles.
 - b. They may cause a delay in the quick movement of traffic.

8.APPLICATIONS -

- It is used when the traffic is heavy.
- It is used to control the noise and pollution in that place.

9.CONCLUSION -

- This project focuses on implementation of smart traffic signals.
- The system benefits of smart traffic signal control to do well by avoiding time wastage.
- Developing a smart traffic signal solutions with in a city solves the pollution and noise problems.

10.FUTURE SCOPE -

The current design can be promoted by monitoring and controlling an intersection with double roads.Future improvements can be added such as pedestrian crossing button,delay timing displays,as well as car accident and failure modes.To study the system performance,traffic dats can be recorded and downloaded to computer platform where statistical data analysis studies could be applied to better understand the traffic flows between the intersections.Finally,smart traffic signal controller could be powered by solar power panels to reduce electricity consumptio and decrease pollution and noise.

11.BIBOLOGY -

1 . Jiang, D.; Delgrossi, L. IEEE 802.11p: Towards an international standard for wireless access in vehicular environments. In Proceedings of the VTC Spring 2008-IEEE Vehicular Technology Conference, Singapore, 11–14 May 2008; pp. 2036–2040.

2.Ahn, S.; Choi, J. Internet of vehicles and cost-effective traffic signal control. Sensors 2019, 19, 1275. [CrossRef] [PubMed]