A Review Paper on Adaptive Traffic Signal Control System

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Abstract- *The adaptive traffic signal control system is a useful tool for reducing traffic congestion in cities. The system may alter signal timing settings in real time in response to seasonal changes and short-term fluctuations in traffic demand, this paper review resulting in improved traffic operation efficiency on metropolitan road networks.the aim of this review study is To achieve smooth and easy flow of the traffic at intersection. And To make the streets safe for the movements of both pedestrian and vehicle.*

Keywords- Traffic Voloume, traffic dynamics, CF behaviors, computational efficiency

I. INTRODUCTION

Every person in the city spends a portion of his time at traffic signals. Because of the increased density of vehicles, traffic lights are overloaded, which not only creates delays but also contributes to environmental degradation and health hazards owing to car fuel pollution. Currently, signal timing is determined by peak-hour traffic conditions. Because of this, the normal cycle time of traffic is longer, although this timing has an impact on traffic during non-peak hours. We've seen that while the signal is green, there is no traffic flow from that direction since the time spent by the public on the other side of the signal is squandered. This paper introduceda real time system which will make the signal system more efficient with the study of literature papers. One of the indicators of a country's economic growth is the rapid increase in car ownership. However, vehicle ownership has an indirect effect on severe traffic congestion. For numerous reasons, exploitation of new trends and technologies necessitates rapid transit of products, machinery, and labour. Each person's purpose is to arrive at their destination without wasting time or money. However, contemporary infrastructures have limited resources. As a result, road traffic management is critical for reducing waiting and travel times, as well as saving fuel and money. Despite the fact that the current traffic signal management system manages traffic at junctions, it frequently causes congestion and accidents due to its poor performance.

Figure No1.1 (Traffic volume &Sensor)

II. REFERENCE WORK

A. **Dengue hen teal, (year 2019):** The effects of variability in driving behaviors, as indicated in acceleration and CF behaviors, on traffic dynamics and throughput were explored in this paper. The consequences of each behavior were explored analytically to reveal the impact mechanisms, and then integrated into simulations to analyze the total effects. Different vehicles have different (preferred or maximum permissible) acceleration rates and intended speeds, resulting in heterogeneity in acceleration behavior.

B. **Chin-Hung Lee et al, (year 2019)** : The traffic control centre in this paper discusses how vigilance decrement is a common occurrence that has a significant detrimental impact on human performance. It might happen at any moment. Using connected physical items and artificial intelligence approaches, this work aims to present a data-driven way for proactively detecting vigilance decrement. First, a novel approach for creating a vigilance model based on eye movement data was developed. To increase computational efficiency and sustain model performance in the event of data loss, graph-based feature selection and distributed model generation are proposed. To construct vigilance models, two track bagged trees are provided. As

a result, this new model can fill in the gaps in studies on eye movement-based vigilance decrement detection and alarming proactive mechanisms.

C. **Monica Menendez et al, (2019):** We add a priority scheme into the multi-scale perimeter management technique in this study to enable timely service to specific groups of cars. This is accomplished by establishing priority lanes at perimeter intersections with better signal timings and a dynamic toll. To generate a more accurate VOT distribution, we develop a recursive estimating approach that uses data from connected automobiles. The vehicle decides whether or not to use the priority lanes based on the updated VOT distributions via the Bayesianfilterifa connected vehicle. The results show that the recursive estimating approach successfully enhances the controller's performance, especially when there is insufficient knowledge about the VOT distribution. The proposed technique can also perform well in a variety of circumstances with varying lane choosing behaviours. This demonstrates that the all-or-nothing approximation framework has no effect on control performance.

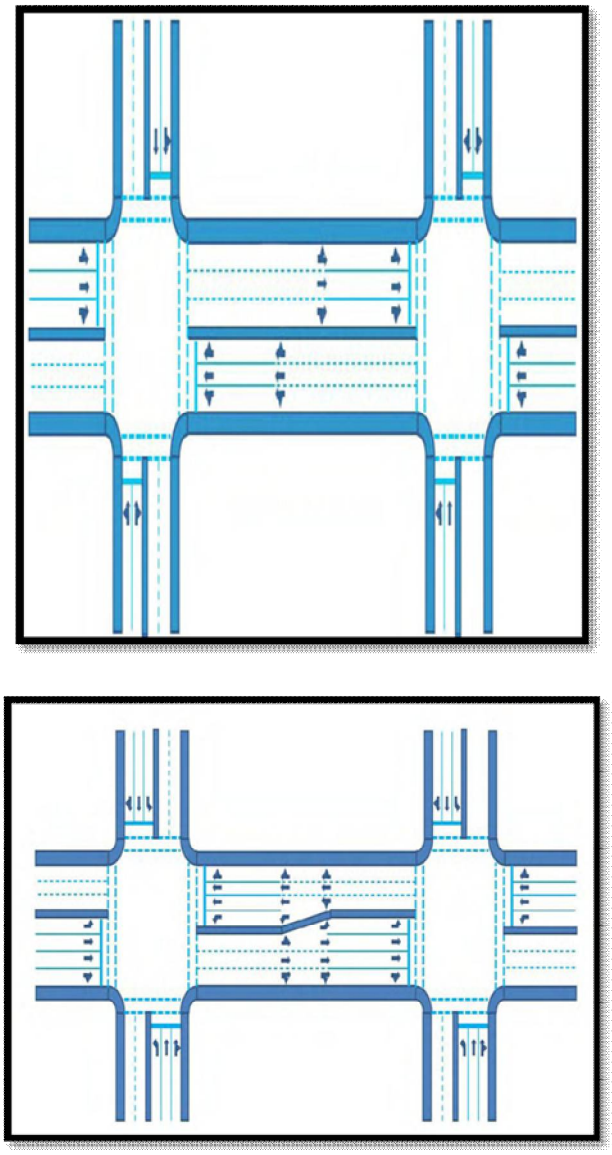
D. **Valerie Kapitanova (2018):** The method for forecasting network control actions affecting traffic flows, based on a piecewise-constant approximation of a traffic flow intensity function of time, was suggested as a result of the work done, based on an analysis of existing approaches and application of mathematical modelling methods. The example of anticipating control actions (cycle shifts) to provide synchronised control on roadways demonstrates the simplicity and efficiency of the offered method.

E. **AnaikaKumara et al, (April 2017):** In this study, he proposes an automated dynamic approach to solve the traffic congestion problem without involving humans. This system takes snapshots from CCTV cameras as input, processes the photos to extract vehicle density on each side of the intersection, and calculates traffic light timing slots.Because the computation focuses on the number of cars, vehicle density, number of phase cycles, peak factor, and other factors, this approach can be used for both independent and dependent signals. Because the aforementioned elements are independent of the relationship between two consecutive signals, they serve as a bonus. Furthermore, because the development is object-driven, the system is flexible.

F. **Oyez Wahyunggoro et al, (2015):** The simulation findings reveal that the system is controlled by fuzzy logic. The Sugeno technique can adjust to changing traffic conditions around an intersection. The fuzzy system can respond to the given random input. The green time is output by the fuzzy system in a variety of ways. Both the fuzzy logic control and fixed time control traffic light control systems have varied performance results.

G. **Ashish Bhalerao (2015) :** The suggested system has an advantage over traditional systems in that it contains an Emergency sequence mode for ambulances, allowing them to go with the least amount of difficulty. It is an adaptive system since it can work in both normal and emergency modes and adapts automatically to the sensor output. In this system, the emergency timer is crucial.

H. **Snehal R.Jadhav et al (2013):** This project introduces the smartness of traffic signal controllers with sophisticated functionalities and hardware interface. In terms of shorter waiting time, efficient operation during emergency mode, and providing alternate routes, the proposed system outperforms the current traffic control system.



Intersection Improvement Plan

III. CONCLUSION

On this paper concluded that The objective need and development direction of traffic control technology is to address the limitations and major flaws of existing traffic signal control systems, relying on a wealth of traffic control interaction conditions and data, and developing a collaborative control system with a high degree of refinement, precision, and better responsiveness and intelligence. Despite the fact that the paper's conclusion is multi-intersection coordination control theory in an oriented future traffic environment, it can provide scientific support for the construction of future road network traffic control systems and be widely employed in new generation traffic control systems.

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