IJFANS INTERNATIONAL JOURNAL OF FOOD AND NUTRITIONAL SCIENCES
ISSN PRINT 2319 1775 Online 2320 7876

Research paper UGC CARE Listed (Group -I) Journal Volume 11, Iss 4, April 2022

An Evaluation on Intelligent Traffic Management System: Implementation, Major Issues and Solutions

Nisha Sahal, Assistant Professor,
Department of Civil Engineering, Teerthanker Mahaveer University, Moradabad, Uttar Pradesh, India
Email Id- nisharsahal@gmail.com

ABSTRACT: ***The number of automobiles in use today has grown rapidly, however the fundamental capabilities of roadways and mobility networks haven't yet kept pace in order to effectively handle the volume of automobiles using these. As a result, there are more traffic-related pollutants as well as congestion jams, which has a negative social as well as economic impact on many economies throughout the globe. According to highway congestion, a dynamic management technology could obstruct vehicular visitors. In order to monitor traffic but instead minimise gridlock on the roads, wireless sensor networks (WSNs) are receiving more as well as more interest. WSNs are greatly in-demand because to extremely quick data transmission, simple setup, low upkeep requirements, small design, as well as lower cost when comparing to alternative networking solutions. Considerable investigation must have been done on Traffic Monitoring Devices that use WSNs to reduce Average-Waiting Times (AWTs) of cars at junctions, prevent gridlock, as well as guarantee priority for rescue automobiles. Employing Routing algorithms, LIDARS, WiMAX, Packet forwarding, Wireless controllers, webcams, and ultraviolet communications, investigators have started to track genuine activity in previous years. In order to lessen overcrowding as well as the average automobile weights (AWTs), this study provides an overview of current priority-rooted signalling urban traffic control strategies. This study's primary goal is to create a categorization of the many traffic administration techniques that are utilised to reduce overcrowding.***

KEYWORDS: ***System, Traffic Management, Transport, Vehicle.***

1. INTRODUCTION

Highway bottlenecks, pollutants, as well as inefficiencies in logistical transit have all been brought on by the fast expansion in the number of automobiles in urban regions. IoT is a new breakthrough that is advancing the world toward sophisticated administration technologies and automation procedures. The above provides a significant commitment to mechanization and intelligent societies. Transportation regulation and efficient common control assist conserve many priceless assets. The IoT with ITM is also already clearly related to several objects, including automated cars, cooperative transportation networks, and smart roadways, which improves information transfer as well as creates diverse networking between lower-bandwidth devices in high-capacity locations all over the globe. India is a emerging nation, and in accordance with the NSO research, its Economy would decline by 7.70% in the fiscal year 2017, compared to a development ratio of 4.20% in 2012. The above report demonstrates how India's economy has expanded substantially as well as raised people's living standards. Every nation experiences a surge in the quantity of both private and corporate cars [1]–[3].

This has increased crash risk, backed up operations, clogged up the traffic, ultimately polluted the environment. ITM devices are becoming more in demand. Techniques with mostly mechanical traffic management needed more labour. Governments are unable to efficiently control congestion in all places utilising a manually method because of these organizations' appallingly weak transportation regulations and personnel capital capabilities. In metropolitan locations, transportation signal devices are installed to alleviate traffic bottlenecks. The

ISSN PRINT 2319 1775 Online 2320 7876

Research paper UGC CARE Listed (Group -I) Journal Volume 11, Iss 4, April 2022

frequent distribution of signal signals, meanwhile, is consistent as well as equal for all roadways. The indicators are not comparable because of the fluid arrival congestion on both ends of the highway, wasting resources as a consequence. Running a traffic and transportation systems would be challenging as the number of vehicles and road constructions increases. Typically, a wildebeest crossings is located close to each traffic light, so each light has a certain period during which it must work [4], [5]. This whole procedure happens in succession. This typical traffic-handling system has a weakness because it is unable to identify the presence of cars along each road, which causes the stoplight for that pathway to waste time even though no cars are present. That conventional system for managing automobiles is unable to regulate congestion and prevent gridlock. Cities thus desire a superior replacement for the "Smart Transport Administration Systems". The WSN-based Traffic Management Network is shown in Figure 1.

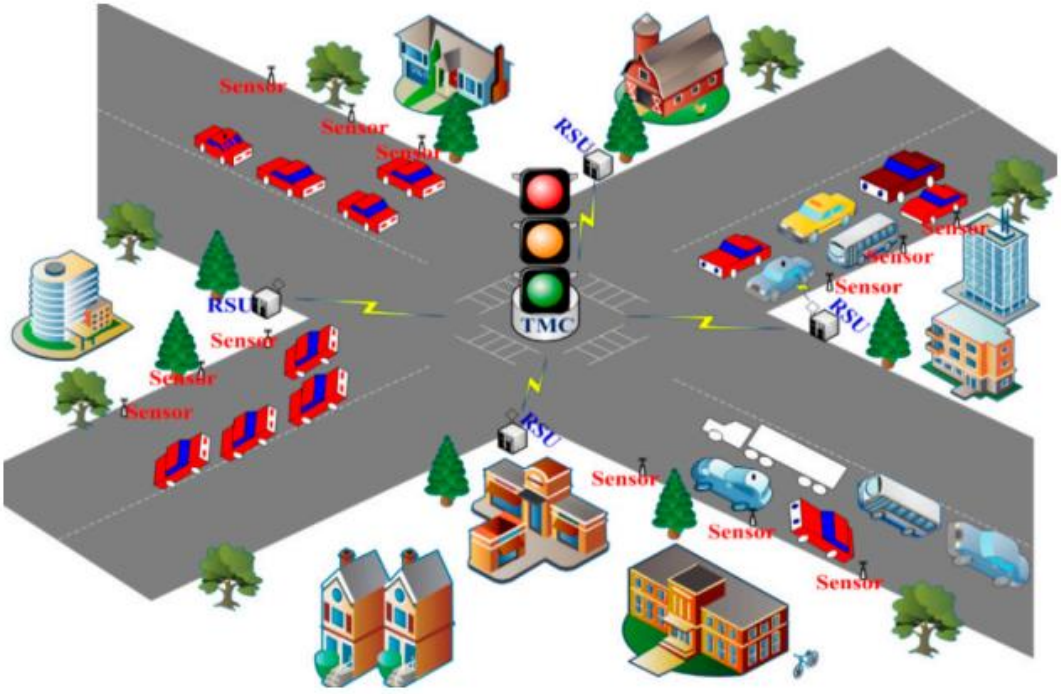

Figure 1: Illustrates the WSN-rooted Traffic Management System [6]**.**

2. DISCUSSION

A phenomenon in transportation known as transportation congested may include big crowds, slowed automobile speeds, and even longer automobile lengths. That since mid-1960s, there has been a sharp rise in traffic jams on metropolitan transport systems. Whenever there is limited availability for transportation, the contact seen between cars slows down the flow of travel, which eventually leads to congested. Intelligent traffic management systems may be used in the current situation to address these issues, and we're now researching ways to create cities with no congestion. By using image analysis with Surveillance cameras, this strategic alignment in the surveillance of signalized intersections and automobile movement. Cameras and microphones aid in photo editing and count the number of motorists using the ground of the highway. It aids in reducing both vehicle energy usage as well as road traffic bottlenecks. Instruments are employed to count the number of cars and measure their acceleration. The information gleaned could be sent to Varying Messaging Symbol (VMS) Displays by coordinating the CCTV equipment with detectors. The intelligence about congestion is shown

ISSN PRINT 2319 1775 Online 2320 7876
Research paper UGC CARE Listed (Group -I) Journal Volume 11, Iss 4, April 2022

on this billboard for the benefit of drivers. This aids in reducing long waits by directing traffic while changing the roadways as soon as possible. Although the waiting period is less, gasoline is immediately utilised. Consequently, cutting down on gasoline use aids in reducing air quality. Traffic may be decreased and a transport environment could be provided by developing the monitoring system and identifying the issues encountered on the route [1].

Throughout many places, traffic jams is a big problem. The primary causes of road gridlock are disregard for road markings, ineffective legislation administration, including improper control of safety lights. Another of the biggest issues with communities is how hard it is to keep building on the current infrastructure. Keeping this in consideration, using technical solutions is one of the most readily widely accessible options which might enable better administration of the road signals. There are various techniques for managing congestion, including wireless sensing networks, electromagnetic loop detecting, infrared detectors, camera information processing, including a few more approaches.

In daily life, traffic bottleneck is quite important. A large number of automobiles are gathered in this condition as a result of bad traffic laws including car wrecks. Rising population is the major factor. Individuals in numerous places have had to deal with this major issue on a regular basis. Since it must be dealt with every day, individuals would be mentally impacted. It also has a detrimental impact on individuals' individual, professional, as well as educational lives. Because of road congestion, there is often gasoline and timewasting. Because the postponement in their usual occupational activities, this causes tension to rise and often results in irritation. Constant horn blowing contributes to noise degradation. Designers have a research on sustainable urban transport system, which performance and stoplights that are typically performed to regulate the flow of traffic on the roads. Surveillance cameras have been installed for surveillance purposes to record the motion of cars on the roadway. Surveillance systems can help with image analysis, making it effective. The facts well about quantity of moving cars is provided through image analysis. Technology enables prompt and accurate vehicle monitoring. Through some kind of detector, the edited picture is sent to electronic traffic symbol panels. Highway motorists will be able to recognise the way that is clear of congestion but may modify their route. If it is accomplished, it aids in reducing the current major issue of traffic overcrowding on the roads, that increases gas mileage. Lower fuel use also results in less carbon emissions, which creates a more eco - friendly environment [7].

This essay examines how the Iot is being used to enhance smart controlling traffic systems (IoT). It functions as intermediary on the IoT platform as well as enhances the concept of the smart home with features like parking systems, traffic signal management, intelligent emergency assist, anti-theft surveillance system, and many others. This same Internet of Things (IoT) offers a useful method of communication between online gadgets with traffic-embedded sensors, services, actuators, and other associated networks. As a result, the use of IoT in intelligent traffic administration systems has been expanded to include continual observation as well as assuring the protection and security of senior citizens in addition to the reduction of road congestion, enhancement of smog, and optimisation of pedestrian traffic. IoT analyses car traffic, manages traffic, that saves the right decisions for prospective data presentations by collecting facts from a variety of live traffic resources. Although this method combines an excellent machine learning method with a dataset-driven strategy, there are operational restrictions. Nevertheless, according to the current research viewpoint, our study offers a useful perspective on the deployment of IoT inside the intelligent traffic control scheme [8].

We've all encountered traffic snarls as well as gridlock at some point. For many that travel everyday to work, education, as well as other locations, it is a taxing process. They must get

ISSN PRINT 2319 1775 Online 2320 7876

Research paper UGC CARE Listed (Group -I) Journal Volume 11, Iss 4, April 2022

up quite early and leave for business very late in order to guarantee arriving at their destination. There is almost no time left over to take care of the valuable guidance and support, including the kids. Daily exposure to certain sorts causes mental fatigue, annoyance, even psycho-social issues. Changes in eating choices and a lack of activity contribute to physical wellness issues as well. As a result, there are numerous potentially detrimental repercussions of traffic gridlock on humans. The number of automobiles and bicycles being purchased by consumers for comfort has led to a rise in pedestrians. Throughout India, people spend longer longer waiting at traffic lights on usual. The majority of the time, traffic lights are either physically observed or timed. Highway policeman are required for manual surveillance, a practice that entails using too few people. These timers, in contrast hand, were set depending on the volume of traffic in the region and are not automatic; for instance, if a highway is given a green signal timing of thirty seconds, that duration is maintained both in lighter congestion (Figure 2).

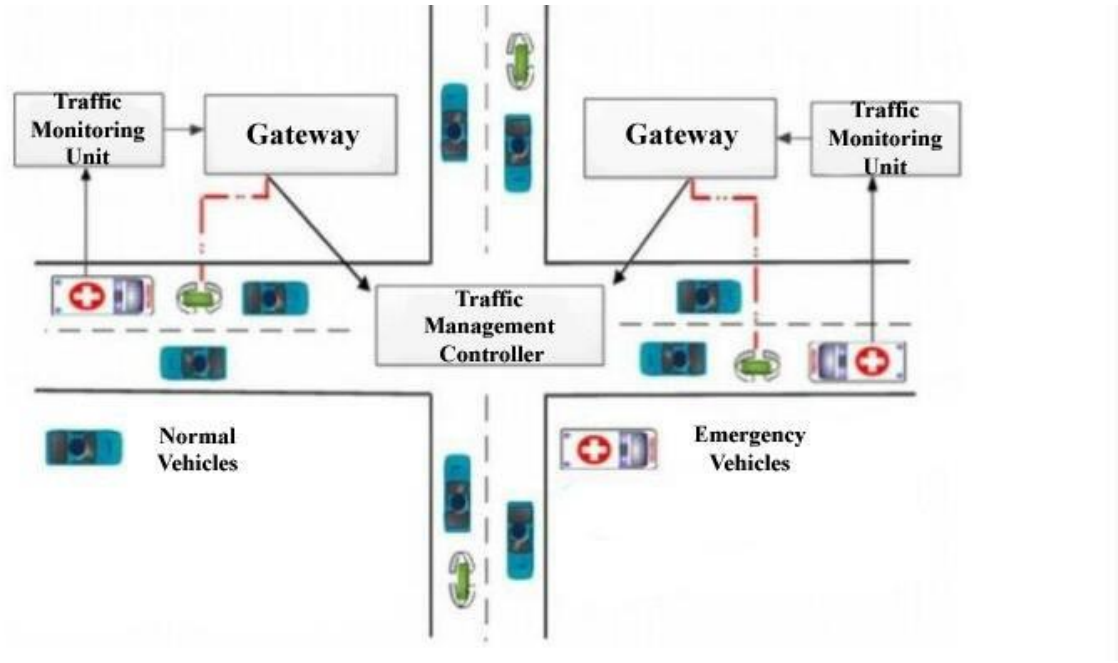

Figure 2: Illustrates the intelligent traffic management system using the gateways a traffic management controller.

The quantity of cars in use today has dramatically expanded, but our roadways and mobility infrastructures' capacities are still undeveloped and cannot keep up with this growth in automobile traffic. As just a result, our modern cities often exhibit characteristics like traffic congestion, auto accidents, and increased particulate emissions. Integrated Traffic Enforcement Systems were established as a result of the rise of the Internet of Things including its use in Transport Systems, which provides the ideal platform for tackling congested roads challenges [9], [10].

3. CONCLUSION

Researchers have provided a thorough analysis of current urban congestion administration strategies in this study. To offer an understanding of the objectives of urban traffic administration, including primary difficulties with congestion regulation, median waiting time decrease, giving urgent vehicles priority, and the architectural criteria of intelligent transportation systems are explored. Although there have been several experimental projects including good advancements within traffic management techniques recently, there are still problems which must be solved. Additional study is indicated for a few topics. There is no way

ISSN PRINT 2319 1775 Online 2320 7876

Research paper UGC CARE Listed (Group -I) Journal Volume 11, Iss 4, April 2022

to ensure a real-time traffic control system. To guarantee that the urban transportation system can respond to real-time demand, difficulties with digesting huge volumes of real-time traffic data, the control program's operating duration, and dependability must be resolved. To overcome the real-time difficulties, it is necessary to construct an intelligent traffic cloud using cloud computing. In order to help decision-makers develop driving laws as well as regulations, it is advised that information variables like the frequency of accidents and road infractions be included in traffic administration systems in future study.

REFERENCES:

[1] M. Gentili and P. B. Mirchandani, "Locating sensors on traffic networks: Models, challenges and research opportunities," *Transp. Res. Part C Emerg. Technol.*, 2012, doi: 10.1016/j.trc.2012.01.004.

[2] C. Chen, R. K. Mosbeh, Z. Wang, Q. Gao, and J. Zhong, "Design of a long-term monitoring system for a PSC continuous Boxgirder bridge," *Key Eng. Mater.*, 2014, doi: 10.4028/www.scientific.net/KEM.619.1.

[3] M. Weber, "Interaction of automatic traffic control & toll collection systems-the M4 'Don' highway, an example from Russia," 2012.

[4] T. Jiang, J. Geller, D. Ni, and J. Collura, "Unmanned Aircraft System traffic management: Concept of operation and system architecture," *Int. J. Transp. Sci. Technol.*, 2016, doi: 10.1016/j.ijtst.2017.01.004.

[5] S. Long, L. Gentry, and G. H. Bham, "Driver perceptions and sources of user dissatisfaction in the implementation of variable speed limit systems," *Transp. Policy*, 2012, doi: 10.1016/j.tranpol.2012.05.007.

[6] K. Nellore and G. P. Hancke, "A survey on urban traffic management system using wireless sensor networks," *Sensors (Switzerland)*. 2016. doi: 10.3390/s16020157.

[7] C. T. Barba, M. Á. Mateos, P. R. Soto, A. M. Mezher, and M. A. Igartua, "Smart city for VANETs using warning messages, traffic statistics and intelligent traffic lights," 2012. doi: 10.1109/IVS.2012.6232229.

[8] Harvard Business Review, "Internet of Things: Science Fiction or Business Fact?," *Harv. Bus. Rev.*, 2014.

[9] L. L. Tupper, M. A. Chowdhury, L. Klotz, and R. N. Fries, "Measuring Sustainability: How Traffic Incident Management through Intelligent Transportation Systems has Greater Energy and Environmental Benefits than Common Construction-Phase Strategies for 'Green' Roadways," *Int. J. Sustain. Transp.*, 2012, doi: 10.1080/15568318.2011.597910.

[10] G. W. Zhang, "Construction and operation management of urban rail transit in China," *Jiaotong Yunshu Xitong Gongcheng Yu Xinxi/Journal Transp. Syst. Eng. Inf. Technol.*, 2013.