



# Methods To Control The Traffic Using Movable Road Divider

Amrutha A Kulkarni<sup>1</sup>, Anees Fathima<sup>2</sup>, G D Harshitha<sup>3</sup>, G Kavya<sup>4</sup>, Sarvar Begum<sup>5</sup>

Student, Department of Computer Science and Engineering, Rao Bahadur Y Mahabaleswarappa Engineering College,  
Ballari-583103<sup>1-4</sup>

Assistant Professor, Computer Science and Engineering, Rao Bahadur Y Mahabaleswarappa Engineering College  
Ballari-583103<sup>5</sup>

**Abstract:** One of the most serious issues in recent years has been traffic congestion. The number of cars on the road is increasing as the population and the number of cars per family grow. Despite technological advancements, there has been no adequate solution to this problem. It has emerged as the most difficult problem for urban developers in terms of planning sustainable cities. A road divider is essentially used as a barrier to separate vehicles traveling in opposite directions on the road. The road dividers which we have observed around us, are static, meaning they cannot be shifted or moved from one location to another. During peak/rush hours, we experience extremely heavy traffic on only one side of the road. So, the primary goal is to reduce it by providing an effective solution. In this paper we are discussing the methods to solve this problem. The "Automatic Movable Smart Road Dividers" aims to address traffic congestion by dynamically adjusting the road divider to accommodate traffic flow, potentially leading to improved traffic conditions and reduced travel times. Additionally, the system prioritizes providing clearance for emergency vehicles, reflecting a socially responsible aspect that could enhance emergency response times.

**Keywords:** Automatic Movable Smart Road Dividers, Static road divider, Prevent traffic congestion, IR sensor, RF module

## I. INTRODUCTION

In recent years, there has been a proportional growth in the number of cars on the road. The number of vehicles on the road has increased, but the infrastructure remains stagnant and unable to accommodate changes such as congestion and unpredictable journey times. Despite efforts to alleviate traffic congestion, it remains a serious challenge in urban cities. It has emerged as one of the most significant challenges for urban developers seeking to build sustainable cities with traffic-free lanes. India's traffic is inherently chaotic and noisy. Identifying the magnitude of traffic congestion is critical for characterizing the problem and implementing suitable responses. This study focuses on understanding reoccurring urban congestion, measuring it, taking precautions, and proposing solutions. Widening or building new roads will increase traffic and cause congestion to return to its previous levels. The city's entire available space for the construction of roads, trains, and other modes of transportation is limited. This survey discusses about movable traffic dividers to alleviate congestion in metropolitan areas, as opposed to typical road widening solutions. The moveable traffic road divider optimizes road capacity and maximizes its benefits.

## II. LITRATURE SURVEY

1) The paper "Automatic Movable Smart Road Dividers - IoT Based Solution to Traffic Congestion Problems" by Keerthan A J, Likhith H D, Chetan H S, Kiran K P, and Sumaiya M N, published in June 2020, published in International Journal of Innovative Science and Research Technology. It introduces a novel approach to traffic management through the utilization of IoT-based smart road dividers. The literature review within the paper delves into various technologies and methodologies for traffic management systems, showcasing a diverse range of innovative solutions. One of the highlighted systems is an intelligent traffic management system grounded in the Internet of Things (IoT), which leverages interconnected devices to optimize traffic flow and enhance overall efficiency. Additionally, the paper explores the application of RFID technology for vehicle identification and traffic flow management, enabling seamless tracking and control of vehicles on the road. Another notable technology discussed is an image-capturing process designed for traffic light control, utilizing advanced imaging techniques to regulate traffic signals effectively. Furthermore, the paper delves into an automated traffic signal system that integrates image processing and infrared sensors to streamline traffic management operations.



Lastly, a flexible traffic management system incorporating fuzzy logic for adaptive traffic control is examined, offering dynamic adjustments based on real-time traffic conditions. The benefits of these systems are manifold, including improved traffic flow efficiency, prioritization of emergency vehicles for swift clearance, and scalability for widespread deployment across various traffic scenarios. However, it is essential to acknowledge certain drawbacks associated with these technologies, such as high implementation costs, system complexity, and potential interference with existing infrastructure for traffic control. Despite these challenges, the innovative solutions presented in the paper hold promise for revolutionizing traffic management practices and addressing congestion issues effectively.

2) The paper "Automatic Movable Smart Road Divider Using IoT" by Sowjanya K N, Nikhil Jamadagni H M, K Unnimaya, and Bhavana G was published in July 2021, With the help of Internet of Things technology, the system installs a dynamic road divider that modifies lane distribution in response to real-time traffic. This method provides a flexible approach to traffic control, especially in rush hours when traditional barriers could result in idle lanes. By means of synchronized traffic signal regulation, the inclusion of an RF Module guarantees a free path for emergency vehicles, including ambulances. The value of taking preventative action to solve the problems associated with urban congestion and enhance traffic safety which improved urban mobility, decreased latency and optimal traffic flow are all benefits of the Automatic Movable Smart Road Divider. Adaptive traffic management are made possible by the real-time data collecting and analysis made possible by the incorporation of IoT technologies. Furthermore, giving emergency vehicles a clear path improves road safety and reaction times in dire circumstances. Implementing the system will be difficult due to high upfront costs for sensor and IoT infrastructure setup, as well as ongoing maintenance. Technical difficulties may arise when integrating cloud storage and IoT components, affecting system functionality. Accuracy and reliability issues with IR sensors in determining traffic density and regulating the movement of the road divider could pose difficulties. The technical issues or adverse weather conditions may also have an impact on the system's efficacy, limiting its ability to effectively control traffic flow. The traffic density on each side of the road is continuously monitored by the system using infrared sensors that are positioned along the road divider. The central control system receives data from various sensors, processes it and dynamically modifies the road divider's location to maximize lane distribution based on traffic flow. IoT technology supports the system's operation by facilitating smooth data exchange and connectivity amongst its many components. The initial implementation costs associated with setting up the infrastructure, including installing and maintaining the IR sensors, IoT technology and RF Module. These costs may pose a barrier to widespread adoption, especially for cities or regions with limited budgets for transportation infrastructure upgrades.

3) The paper "Movable Road Dividers" published in the year June 2020 in the International Research Journal of Engineering and Technology (IRJET) by the authors are Rashmi, Roopa T, Samrudh, Sandhya. This paper major goal is to reduce traffic congestion in our daily lives. The problem with the Static Road Dividers is that the number of lanes on each side of the road is fixed and cannot be changed. This necessitates a better usage of current resources, such as the number of available lanes, without the addition of any new resources. The dilemma is exacerbated when an emergency vehicle must wait for other vehicles to yield at traffic signals. This generates a temporal lag and may have an impact on the emergency situation. In our paper, the IR sensors will be able to identify objects up to 100 meters away, and a corresponding signal

will be sent to clear the path to the ambulance. Two sides of the road have RGB LEDs installed. When the divider receives a signal from the ambulance, the RGB LEDs that are linked to the roadside will begin to glow. Only ambulances will be permitted on this tight path. The system aims to address the challenges faced by emergency vehicles at intersections. An ultrasonic sensor is part of a microcontroller-based module that has been built to measure traffic density and adjust the dividers automatically, when a traffic signal is red its density is monitored and appropriate action should be taken prior to the signal turning green. The road is widened for the high-density side and the divider goes to the low traffic side if the traffic density is high. When there is normal traffic density, no action is conducted and a message stating that traffic is normal is alerted. By using a traffic light control system based on a Wi-Fi module, the paper intends to prioritize and facilitate the movement of emergency vehicles, potentially saving lives in critical situations. The paper aims to address traffic congestion and emergency vehicle prioritization, it may have limitations in addressing broader transportation issues, such as public transportation challenges or urban planning issues. It's important to recognize the scope of the project in the context of overall traffic management.

4) The paper "The Smart Movable Road Divider with Ambulance Priority System using IoT" published in the year July 2021 in the International Research Journal of Engineering and Technology (IRJET) by the authors Subhashitha D and Dr. Mukthi S L. A road divider is essentially used as a barrier to separate vehicles traveling in opposite directions on the road. The road dividers which we have observed around us, are static, meaning they cannot be shifted or moved from one location to another. During peak/rush hours, we have also experienced extremely heavy traffic on only one side of the road.



When there is a lot of traffic, it creates accidents and many emergency vehicles get trapped, which can lead to fatalities. As a result, an efficient method is provided here, in which a smart moveable road divider is developed that works based on road density. This technology uses Arduino mega for the controlling actions. It will receive inputs from IR sensors, ultrasonic sensors and RFID reader. In this case, IR sensors are used for each road. IR sensor, determine the road density is the first stage. Next, the values that were obtained need to be compared to one another. Here, the threshold is set to 50, which means that divider and signal actions are needed if the IR sensor reading is higher than 50 on any given route. Afterwards, alarms are provided if any vehicles are in close proximity to the divider. More lanes are then created for the denser side by moving the divider. Once the cars have passed, the divider and signal revert to their initial configuration. Thus, the divider movement was regulated according to density. The divider will stop moving if the ultrasonic sensor detects the presence of any object. The LCD panel will show every movement taken by the road divider. The output will be produced by the LCD, LED'S, DC motor. It prioritizes ambulance routes using RFID, potentially reducing response times. Signal violation detection, backed by IR sensors and RFID, promotes safety, triggering alerts to nearby police stations. The system's flexibility adapts to changing conditions. IoT integration enables real-time monitoring, and a multi-sensor system ensures accuracy. Overall, it represents a significant technological advancement for urban traffic control.

### III. CONCLUSION

In conclusion, creative solutions are needed to address the growing problem of traffic congestion. A dynamic solution to traffic management is provided by methods to control the traffic using movable road divider, which makes use of IR sensors, Internet of Things technologies, RF module, wifi module, Image processing and RGB LEDs. The technology prioritizes emergency vehicle clearance and improves road capacity by automatically altering divider placements based on real-time traffic density. This could improve response times and overall road safety. The literature review emphasises the system's potential advantages, such as enhanced traffic flow and safety; however, there are obstacles to be overcome, such as the expense of implementation, the intricacies of the technology, and the requirement for extensive field testing. The development of flexible traffic management represents a positive step in the right direction for reducing city traffic.

### IV. FUTURE RESEARCH DIRECTION

In the future, the limitations on increasing road width in developed countries will lead to increased traffic congestion, necessitating alternative traffic control options. The use of modern intelligent transport systems, such as IoT and AI, can facilitate the operation of movable dividers, offering cost-efficient and time-saving benefits. Additionally, there is potential for integrating electrified rails on which the movable dividers would move, serving a dual purpose of facilitating divider movement and charging electric vehicles.

### REFERENCES

- [1]. Rajeshwari Sundar, Santhoshs Hebbar, and Varaprasad Golla, "Implementing intelligent Traffic Control System for Congestion Control, Ambulance Clearance, and Stolen Vehicle Detection" IEEE Sensors Journal, Vol. 15, No. 2, February 2015
- [2]. Shabbir Bhusari, "Traffic control system using Raspberrypi", Global Journal of Advanced Engineering Technologies ISSN (Online), Volume 4, Issue 4- 2015, pp 413415.MARCH2015.
- [3]. Er. Faruk Bin Poyen, Amit Kumar Bhakta, B. Durga Manohar, Imran Ali, Arghya Santra, Awanish Pratap Rao, "Density based traffic control", 2016 International journal of advanced engineering, management and science (IJAEMS), vol-2, issue-8, Aug-2016, ISSN:2454-1311.
- [4]. B. Nandhu Rathi, M. Radha, T. U. Sugitha, V. Tharani and V. Karthikeyan, "Intelligent traffic control system for congestion control, emergency vehicle clearance and stolen vehicle detection", Asian journal of applied science and technology (AJAST), Volume 1, Issue 1, Pages 122-125, February 2017.
- [5]. R. Weil, J. Wootton and A. Garcia Ortiz, "Traffic Incident Detection Sensor and Algorithms", Journal of Mathematical and Computer Modelling, Vol.27 (9), 1998, pp.257-291.
- [6]. Subhashitha D, Dr. Mukthi S L, "Smart Movable Road Divider with Ambulance Priority System Using IoT", International Journal of Engineering Research in Electronics and Communication Engineering (IJERECE), Vol 8, Issue 7, July 2021.
- [7]. Rashmi C, Roopa T N, Samrudh R, Sandhya M, "Movable Road Dividers", International Research Journal of Engineering and Technology (IRJET), Vol 7, Issue 6, June 2020 p-ISSN: 2395-0072, e-ISSN: 2395-0056.
- [8]. Sowjanya K N, Nikhil Jamadagni H M, K Unnimaya, Bhavana G, "Automatic Movable Smart Road Divider Using IOT", International Advanced Research Journal in Science, Engineering and Technology, Vol. 8, Issue 7, July 2021.
- [9]. Keerthan A J, Likhith H D, Chetan H S, Kiran K P, Dr. Sumaiya MN, "Automatic Movable Smart Road Dividers - IOT Based Solution to Traffic Congestion Problems", International Journal of Innovative Science and Research Technology, Vol 5, Issue 6, June - 2020, ISSN No:2456-2165.