

LITERATURE SURVEY

1. **Mrs. Devershi Pallavi Bhatt and Mr. Manish Tiwari**, in their paper titled, "**Smart Traffic Sign Boards (STSB) for Smart Cities**", **2nd smart cities symposium, 24-26 March, 2019, University of Bahrain**, explained how Smart sign boards with various features can be built for modern smart cities. According to them, Smart Traffic Management is a system to monitor and control traffic signals using sensors to regulate traffic flow and avoid congestion for smooth traffic flow. The authors proposed a framework of Smart Traffic Sign Boards (STSB) in this paper, which can communicate with the system deployed in all vehicles to make drivers aware of various road safety signs.
2. **Mr. Abhishek Rai and Mr. Farooque Azam**, in their paper titled, "**Smart Speed Limit Sign Board for Changing Weather Conditions**", **International Journal of Computer Sciences and Engineering, Vol.-7, 14th May 2019**, explained how Smart speed limit sign boards can be built using Iot technologies. Their project's main goal is to contribute to smart transportation based on weather data, which can help reduce congestion and accidents by making speed limit sign boards adaptive. The board which they described, is not limited to displaying speed limits and can be used for other signs as well.
3. **Mr. Ching-Hao Lai and Mr. Chia-Chen Yu**, in their paper titled, "**An Efficient Real-Time Traffic Sign Recognition System for Intelligent Vehicles with Smart Phones**", **2010, International Conference on Technologies and Applications of Artificial Intelligence**. This project's main goal is to contribute to smart transportation based on weather data, which can help reduce congestion and accidents by making speed limit sign boards adaptive. This board is not limited to displaying speed limits and can be used for other signs as well.
4. **Mr. Abd-Elhamid M. Taha**, in his paper titled, "**An IoT Architecture for Assessing Road Safety in Smart Cities**", **Published on 19 November 2018, Wireless Communications and Mobile Computing Volume 2018, Article ID 8214989**. The Architecture proposed by him, involves a novel use of machine learning as part of its road safety assessment core. This application facilitates assessments that are both dynamic and robust. He also showcased an application of the developed core aimed at safety-based route planning in smart cities.
5. **Mr. Ricardo Jorge Fernandes**, in his paper titled, "**VANET-Enabled In-Vehicle Traffic Signs**", **Published on June 2009, University of porto**, provides us a broad overview of Identifying challenges and studying the feasibility of VANET-enabled in-vehicle traffic signs in real environments. In this Paper, the author extended a state-of-the-art microscopic VANET simulator to emulate virtual traffic signs, and thus, evaluate their behaviour and feasibility.
6. **Mr. Abdul Kadar Muhammad Masum, Mr. Kalim Amzad Chy, Mr. Iaamanur Rahman**, in his paper titled, "**An Internet of Things (IoT) based Smart Traffic**

Management System: A Context of Bangladesh”, Published on 27-28 October 2018, 2nd Int. Conf. on Innovations in Science, proposed a real-time traffic management system (TMS) using the Internet of Things (IoT) and data analytics. After analysing the ultrasonic sensor data, system controller sets traffic signal time by traffic management algorithm and also sends data to a cloud server through a Wi-Fi module. The proposed system can predict probable traffic congestion in the intersection point. If an emergency vehicle is detected, it gives priority, i.e. high signal duration to pass the intersection. In case of the signal violation, the system can identify the vehicle and charge a fine that is paid through Traffic Wallet mobile app.

7. **Mr. Seung Byum Seo, Mr. Pamul Yadav, Mr. Dhananjay Singh**, in their paper titled, **“LoRa based architecture for smart town traffic management system”**, **Published on 07 November 2020, Springer Science+Business Media, LLC, part of Springer Nature 2020**, proposed various mechanisms for each step of the process, for vehicle detection they use inductive loop sensor. Also, they have proposed a deep learning-based image processing centered vehicle detection system. Image processing techniques provide an efficient mechanism to recognize the vehicles on the road in real-time. Neural Network algorithms are trained to classify vehicles such as cars, trucks, buses and record the number of vehicles with improved accuracy.
8. **Mr. Dries Naudts, Mr. Vasilis Maglogiannis, Mr. Daniel van den Akker**, in their paper titled, **“Vehicular Communication Management Framework: A Flexible Hybrid Connectivity Platform for CCAM Services”**, **Published on 22 March 2021, Future Internet 2021**. In this paper, they proposed a novel vehicular communication management framework (CAMINO), which incorporates flexible support for both short-range direct and long-range cellular technologies and offers built-in Cooperative Intelligent Transport Systems’ (C-ITS) services for experimental validation in real-life settings. Moreover, integration with vehicle and infrastructure sensors/actuators and external services is enabled using a Distributed Uniform Streaming (DUST) framework.
9. **Mr. Da Zhang, Mr. Mansur R. Kabuka**, In the paper titled, **“Combining weather condition data to predict traffic flow: a GRU-based deep learning approach”**, **Published on 1st March 2018, Department of Electrical and Computer Engineering, University of Miami, Coral Gables, FL, USA**, said, this study applies gated recurrent neural network to predict urban traffic flow considering weather conditions. Running results show that, under the review of weather influences, their method improves predictive accuracy and also decreases the prediction error rate. To their best knowledge, this is the first time that traffic flow is predicted in urban freeways in this particular way. This study examines it with respect to extensive weather influence under gated recurrent unit-based deep learning framework.
10. **Mr. Muhammed O. Sayin, Mr. Chung-Wei Lin, Mr. Eunsuk Kang**, in their paper titled, **“Eunsuk Kang”**, **Published on 3rd June 2019, Life Fellow, IEEE**, they proposed a game theoretical adversarial intervention detection mechanism for reliable smart road signs. A future trend in intelligent transportation systems is “smart road

signs” that incorporate smart codes on their surface to provide more detailed information to smart vehicles. Such smart codes make road sign classification problem aligned with communication settings more than conventional classification. This enables us to integrate well-established results in communication theory, e.g., error-correction methods, into road sign classification problem.