Intelligent Traffic Light System

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Abstract-**During the last decades, the total number of vehicles all over the world increasing very fast. Vehicular travel is increasing throughout the world, particularly in large urban areas. Therefore the need arises for simulating and optimizing traffic control algorithms to better accommodate this increasing demand. Traffic in a city is very much affected by traffic light controllers. To make traffic light controllers more intelligent, we suppose to use the technologies such as communication networks and sensor networks, as well as the use of algorithms for setting traffic lights functioning. Intelligent traffic light system does not only work for minimize the waiting time of road users but also provide information about how to drive through a city in order to save their time.**

***Keywords:*Intelligent Traffic Light Control, Reinforcement Learning, Multi-Agent Systems (MAS), Smart Infrastructures, Transportation Research**

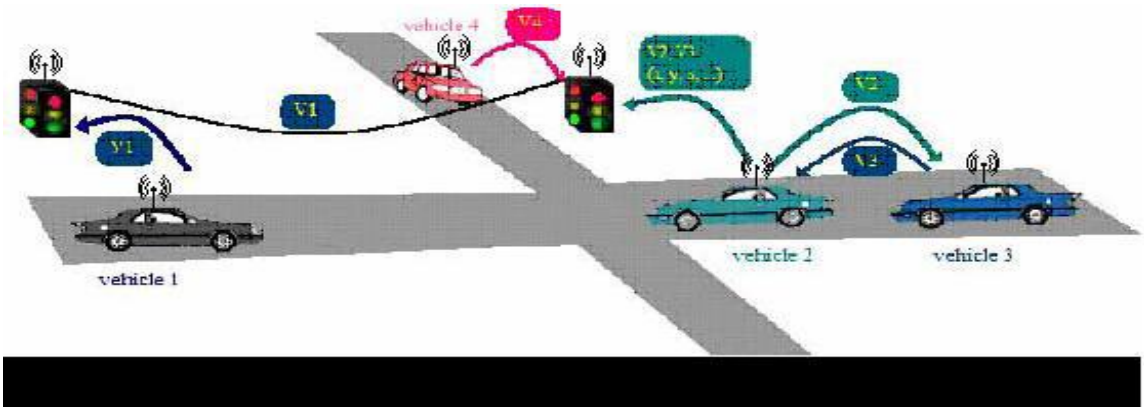
I. INTRODUCTION:

Road safety has become a main issue form governments and car manufacturers in the last twentyyears. The total number of vehicles in the world has experienced a remarkable growth, increasing trafficdensity and causing more and more accidents. In India traffic is growing four times faster than thepopulation. The development of new vehicular technologies has shifted companies, researchers and institutions to focus their efforts on improving road safety. During the last decades, the evolution in wireless technologies has allowed researchers to design communication systems where vehicles take part in the communication networks. Thus networks such as Vehicular Ad Hoc Networks (VANETs) are created to facilitate communication between vehicles themselves and between vehicles and infrastructure. Vehicular ad hoc network (VANET) is a technology that uses moving cars as nodes in a network to create a mobile network [2]. New concepts like smart cities and living labs has emerged in the last years where vehicular networks play an important role

II. LITERATURE REVIEW:

During the last decades, Intelligent Transportation Systems (ITS) have emerged as an efficient way to improve the performance of the flow of vehicles on the roads. The goals of ITS is to provide road safety, comfortable driving and distribution of updated information about the roads. Many papers related to ITS have been presented in recent years. In this section some work about ITS in smart cities is discussed. The work in [4] is a survey about multifunctional data driven intelligent transportation system (D2ITS), which collects a large amount of data from various resources: Vision-Driven ITS (input data collected from video sensors and used recognition including vehicle and pedestrian detection); Multisource-Driven ITS (e.g. inductive-loop detectors, laser radar and GPS); Learning-Driven ITS (effective prediction of the occurrence of accidents to enhance the safety of
Pedestrians by reducing the impact of vehicle collision);and Visualization-Driven ITS (to help decision makers quickly identify abnormal traffic patterns and accordingly take necessary measures). There are some problems regarding object reorganization in some complex situations as shown in figure 1.

In such a situation it becomes difficult to recognizeeach vehicle (object) and perhaps to find out thecentroid of each object. Hence it creates problemscentroid of each object. Hence it creates problemswhile calculating traffic density. Another problem iswhile doing object subtraction, if the color of vehicleand the color of background matches then it becomesdifficult to uniquely identify the object.Figure 1. Complex scenario of trafficIn [5] an adaptive traffic signal control system based on car-to-car communication is presented. Thissystem reduces the waiting time of the vehicles at theintersection along with the reduction in queue length.To realize this system, the concept of clustering isused for the vehicles approaching the intersection. Thedensity of vehicles within the cluster is computedusing a clustering algorithm and sent to the trafficsignal controls to set the timing cycle. It uses DBCV algorithm. This algorithm is a combination of clusterand opportunistic dissemination technique and is usedto gather the required density information. Theclusters are created based on the direction of thevehicles in a given geographic region approaching theintersection. This direction parameter is computedwithin the vehicles by employing GPS and digitalmaps.Another system [6] that takes the control decisionsbased on the information coming from the othervehicles. Each vehicle is equipped with a short rangecommunication device and controller nodes are placedin the intersection with traffic lights as shown infollowing figure. This controller node at intersection acts as adaptive control signal system.



III. CONCLUSION:

Traffic congestion and tidal flow management are Recognized as major problems in urban areas. The proposed intelligent traffic control algorithm is implemented to recover all the traffic changes during the day. In the proposed system the illuminated areas of the vehicles are calculated with respect to the rest of the road area. This system is flexible to maneuver between the three supported levels. The proposed system offers many advantages such as: minimizing the traveling time for vehicles and passengers that minimizing pollution,minimizing the traffic congestion as possible that save energy and reduction in emergency response time

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