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A REVIEW ON TRAFFIC SIGNAL SYNCHRONIZATION IN THE SATURATED HIGH-DENSITY ROAD

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ABSTRACT :- Traffic light control systems are widely used to monitor and control the flow of automobiles through the intersection of numerous streets. They intend to acknowledge smooth movement of vehicles in the transportation courses. Be that as it may, the synchronization of different traffic signal frameworks at nearby convergences is a convoluted issue given the different boundaries included. Regular frameworks don't deal with variable streams moving toward the intersections. Likewise, the common impedance between contiguous traffic signal frameworks, the difference of vehicles stream with time, the mishaps, the entry of crisis vehicles, and the person on foot crossing are not executed in the current rush hour gridlock framework. This prompts gridlock and blockage. The ordinary capacity of traffic signals requires more than sight control and coordination to guarantee that traffic and people on foot move as easily, and securely as possible. A variety of different control systems are used to accomplish this, ranging from simple clockwork mechanisms to sophisticated computerized control and coordination systems that self adjust to minimize delay to people using the junction.

Key ward: - Traffic light Control, LM7812, and Regulator, Tramway.

I. INTRODUCTION

Since the 1990s, the New Urbanism Movement has inspired several Urban Road Network Development trends, counting expanded utilization of the great thickness Grid Road organization (HGRN). The Structure of the HGRN is the symmetrical checkerboard design, with Narrow two – path or four path streets, which are Spaced roughly 100 to 300 meters separated. The thickness of the street in HGRN is Uniform, and there is no huge distinction in the street level.

The essential Characteristics of the HGRN is the homogeity. In an area of HGRN the dissemination of the populace in each block is uniform and the change in the intensity of the land use is small ,So the amount of traffic volume is generated in the each unit area is almost the same. In addition , due to the rational traffic organization ,the HGRN also has the characteristics

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of good Connectivity and Selectivity. HGRN have been implemented in many urban Centers around the World including Manhattan (New york city).

1.1 Phases and stages

Traffic controllers use the concept of phases, which are directions of movement grouped together. For instance, a simple T-junction may have three vehicle movement phases, one for each arm of the junction. There may be additional phases for other movements such as pedestrians, cyclists, bus lanes or tramways.

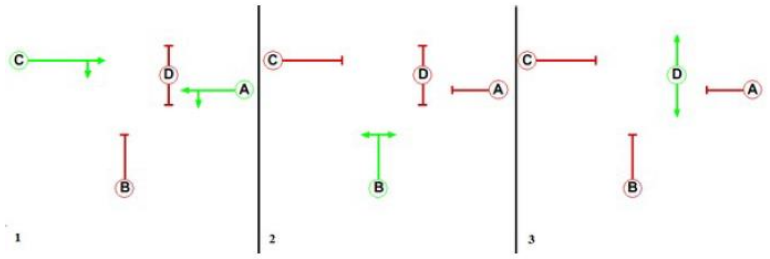

Fig 1.1 Phase and Stages

A stage is a group of non-conflicting phases which move at the same time. This junction has three vehicle phases (A, B and C) and a pedestrian phase (D). The phases operate together in three stages (1, 2 and 3). Moving phases are shown in green and stopped phases are shown in red.

II. WORKING PRINCIPLE OF THE SYSTEM

Information is conveyed from one junction to other so that passing vehicle get least time for waiting at junction and thereby reducing mental headache, fuel, time, traffic problem etc.

2.1 Case Study

To understand the working of the project let's consider a situation where road between Mahiravani to CBS is highly dense and we need green path on this road. Signals encountered in this are Papaya Nursery, ITI signal, ABB Signal and jogging track Signal. Thus total 4 signals are there. Total waiting time per signal considered to be 120min, so in total we have to give 120 sec x 4 =480 Sec = 8 min . This is waiting time for us which we need to make it zero.

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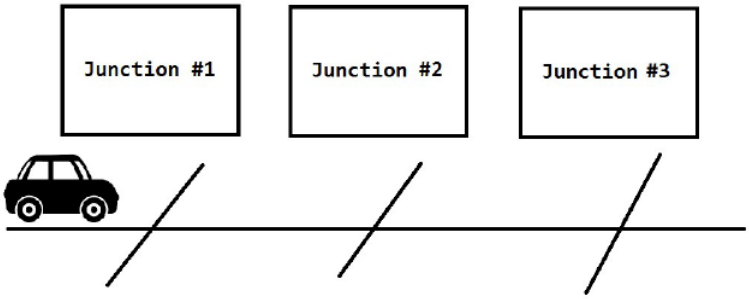

Fig 2.1 Proposed Systems

Thus when vehicle is departed from Mahiravani Embedded System at Mahiravani will give feedback to Inserted System at Papaya Nursery. Time needed to venture out from Mahiravani to Papaya Say 10 min .So at any rate signal at Papaya Nursery needs to make street for green after 10 min fixed time. Additionally an ideal opportunity for Papaya Nursery to ITI signal is 5 min, Time for ITI sign to Jogging track 7 min. So this is the logic .Any how we have to confirm that Road from Mahiravani to Civil has green signal all time so that there is no traffic problem for vehicles on Mahiravani to CBS.

III. POWER SUPPLY FOR HARDWARE

It comprises of two Power supplies, say Power Supply PS1 and PS2. PS1 is utilized to give power supply to the fundamental control board, which is kept at Hall of home. PS2 is utilized to give power supply to control sheets kept at Kitchen and Bed rooms. Activity of both Power supplies is indistinguishable. How about we comprehend the force supply activity for PS1. Two separate transformers having appraisals for each as essential side 230V AC at 50Hz and for optional 12v focus tapped at 500mA of current. Yield of transformer TF1 is given to PS1 which comprises of four diodes in full wave bridge rectifier. This gives out pulsating dc voltage at 12v approximately. We get only +ve half cycles. But for microcontroller to operate we need pure dc voltage, for that we need to filter this pulsating dc voltage this is done with the help of Capacitors of 2200uf. LM7812 voltage regulator IC will regulate voltage to 12V pure dc.

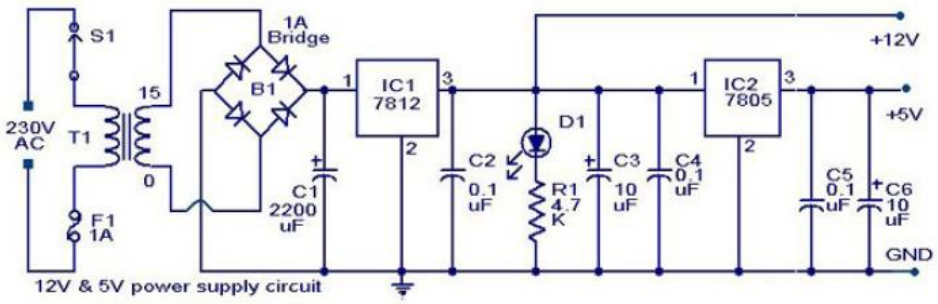

Fig 3.1 Power Supply Circuit Diagram

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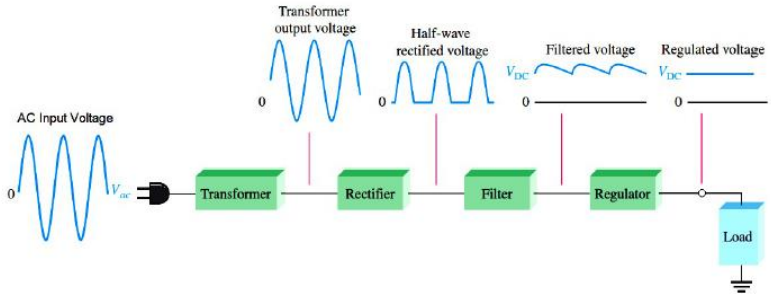

Fig 3.2 Working Principle of Power Supply

IV. CONCLUSION

The time and space for traffic signal optimization are limited in the saturated HGRN, so the execution of traditional sign control strategies isn't palatable. Consequently, the LGLR traffic light synchronization procedure is proposed as another option. This procedure utilizes a similar sign control timing intend to control all signalized crossing points. The green time and the red time for the straight periods of the circumstance plan are somewhat long to restrict the line lengths at all convergences when the lights are red and to guarantee that vehicles can shape the consistent traffic stream and go through a few downstream intersections without stopping when the lights are green. The performances of three signal control models were compared and analyzed by simulations, and results showed that, in the saturated HGRN, the LGLR traffic signal synchronization strategy is much more effective, for the following reasons.

(i) First, in the LGLR traffic signal synchronization strategy, the same signal control timing plan is used at all intersections, which is helpful to uniformly distribute the traffic volumes in the HGRN and to fulfill the advantages of good equilibrium, connectivity, and selectivity of the HGRN.
(ii) Second, when the straight phases of the intersections are LR status, the straight vehicles stop at the stop lines at different intersections in order to limit the queue lengths in the sections and to avoid the spillback congestions to the upstream intersections.
(iii) Third, when the straight phases of the intersections are LG status, the straight vehicles can form continuous traffic flows and go uninterruptedly through several downstream signalized intersections at a steady speed.
(iv) Finally, the optimization is simple, as the traffic parameters of the model can be obtained by the traffic detectors installed in the HGRN, and this requirement of the hardware and software is easy to implement. In short, the essence of the LGLR traffic signal synchronization strategy is to control the formation and dissipation of queues and to maximize the efficiency of traffic flow at signalized intersections in the saturated HGRN, which is the same as Roess et al.'s point that the formation of queues and blockages is inevitable during saturation and removal of queues and blockages must be the prime objectives.

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