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Literature review on Optimization and Coordination of the Signal Timings

Rajeshri tandel [1] , Siddharth gupte[2], Jayesh juremalani[3]

[1]*Civil Department, Parul University Limda, Vadodara,*
[2]*Civil Department, Parul University, Limda, Vadodara.*
[3] *Civil Department, Parul University, Limda, Vadodara.*

Abstract— Traffic on the existing road increasing due to rapid urbanization and industrialization has caused extremely growth of vehicles all over the world. Due to this, some problems like congestion, delay and pollution remain in question if the signal is not coordinated. The basic function of most arterial streets and roadways is to move traffic safely and efficiently with minimum delay. The main source of delay and congestion along most arterial streets and roadways are traffic signals. Too often motorists are required to make unnecessary stops because adjacent traffic signals bear no relationship to each other. This results in longer travel times and increased vehicle emissions and fuel consumption which reduce air and noise pollution. Coordination of signal is achieved when a platoon achieve green phase at successive intersections. Coordination is done by time space diagram of various cycle lengths.

Keywords— Optimize, Traffic volume, Signal Timings, Time space diagram, Coordination

I. LITERATURE SEARCH

MoruguSrujan Kumar, Bhasker Valkati and Dr.R. Srinivasa Kumar (2015) in this study, three adjacent signal intersections were selected to evaluate, optimize and coordinate them. Traffic problems which exist in these intersections are congestion, delay, traffic jam due to heavy traffic volume. All the intersection details such as geometric features, Traffic volume survey by vediography method, signal design is done by Webster method, traffic signal coordination is done by simple progressive method. Coordinating the signals showed better results compared to the present conditions.

H. S. Goliya&Nitin Kumar Jain (2012) in this paper an attempt has been made to study the various intersections, so as to minimize the delays at these intersections and consequently improve the level service. At each intersection the existing traffic data such as traffic volume has been estimated and then signal designed and optimized signal. Traffic signal can be synchronized so that a vehicle starting at one end of the Street and travelling at Preassigned speed can go to other end without stopping for red light.

N. Naveen Kumar(feb-2016) Traffic management plays a vital role in the field of transportation engineering to reduce congestion and travel time to improve service volumes especially in urban areas. After traffic engineering survey, optimum cycle length and saturation flows, green time signal phase are designed and likewise red, amber phases based on Webster's method & IRC guidelines. In this road stretch, adjacent signals are coordinated and the coordinated signal time plans are also developed. This paper solves the traffic congestion causing delays, decrease the travel time and increases the travel speed of vehicles by design of coordinated traffic signals.

Ravi Arora1, Dr P.K. Gupta (MAY 2015) Chandigarh, a Union Territory of India was planned by Le Corbusier and the city also known for its beautiful roundabouts. But these roundabouts become place of slow moving traffic during peak hours. Thus there is a need to use traffic management techniques like coordination of traffic to not only avoid congestion at these roundabouts but also reduce traffic delay caused to traffic. It would be less time consuming for road users to cross these roundabouts, when moving from one roundabout to another.

KishorBambode, Vishal Gajghate (Feb 2014) This paper presents an intelligent transportation system for traffic flow prediction and control it through traffic signal optimization and coordination. It rely on pre timed control signal system or fixed cycle control signal system hence it is beneficial to optimize traffic signal and coordinated it by means of Intelligent transportation system. Synchro is use for signal timing optimization. Signal optimization is very effective techniques for improving intersection level of service and make it more efficient.

Nithya Swaminathan, Nithyanandhan Rathinavel, Senthurkumar Duraisamy, Gunasekaran Karuppanan (July 2014) The Vehicle Actuated Programming has the ability to provide control strategies in response to the real-time traffic conditions. Simulation based model for a major arterial in Chennai is developed using Vehicle Actuated Programming which detects vehicle presence and arrivals to modify the signal timings. The simulation results were compared with the existing fixed time condition and signal co-ordination traffic operations to understand the benefits.

Momin Safabanu Fazalmohammed, Prof. H.K.Dave(2014) This results in longer travel times and increased vehicle emissions and fuel consumption which reduce air and noise pollution. Coordination of signal is achieved when a platoon achieve green phase at successive intersections. In this paper coordination is done by time space diagram of various cycle lengths.

II. Conclusion

This paper presented literature review on optimize the signals timing and co-ordinate for continuation flow of traffic. The intersection is one of the most important parts in traffic network. So the intersection control study is attracting more and more researcher's attention. Signal optimization and co-ordination is very effective techniques for improving intersection level of service, delays, travel time and make it more efficient. The widths of the road should be increased to improve the efficiency of the road stretch. The travel time can be reduced considerably due to coordination. The U turns should not be allowed in middle of the road, at it makes the platoon of vehicles to stop until the vehicle clears the road.

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