

UNIVERSITI TEKNOLOGI MARA

**ANALYSING TRAFFIC LIGHT SYSTEM USING GRAPH
THEORY AND LINEAR PROGRAMMING**

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ABSTRACT

This research paper demonstrates the application of graph theory that can be applied in real life to solve problems in the form of a graph. Therefore, our objectives in this research are to represent traffic flow into compatible graph by using the method of graph theory which is cliques. Next, to simulate maximise or minimise time or traffic light control system by using linear programming. Lastly, to analyses the method of graph theory and linear programming that can be applied in the traffic light control system. Many real problems can be represented using graphs by means of compatible graphs. Furthermore, the method of linear programming is used to solve the optimization which appears in everyday life. In this paper, traffic light control system had been analysed by applying these two methods. The traffic flows that sustain connectors with each other was presented as a compatible group. From the compatible graph, two vertices represented as the flow link by an edge if the flow at the intersection can move simultaneously without any collision. All flows which are compatible were called as a clique. The maximise waiting time at the crossroads can be set by using linear programming after considering the current thickness of vehicles for each flow passed through one junction at Seremban-Kuala Pilah route. The validation had been performed by comparing the saturated time (simulation) and actual time (data) and determining the relative error.