An Intelligent Traffic Light Control System for Ambulance Transpotation (ITLCS)

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ABSTRACT

In this study, we develop an intelligent traffic light system to improve ambulance transportation. The study evaluates different traversal methods and rerouting strategies, and it compares the use of a sub-map to the original map in order to provide the best and easiest paths for ambulances to reach needed locations. The proposed system can be applied to other types of emergency vehicles.

The study identified the cause of delays in ambulances reaching patients and hospitals to be traffic signals and traffic congestion, which may negatively influence patients' health and increase the probability of loss of life. The study proposes an improved approach to

ensure that ambulances reach patient locations and hospitals with minimize delay. The approach is based on Dijkstra's algorithm employing a sub-graph.

It was concluded that using a sub-graph employed by Dijkstra's algorithm enhances efficiency of the traffic light system for ambulance transportation. The improvements are proposed through an Intelligent Traffic Light System for ambulance transportation (ITLCS) for ambulance transportation to present an efficient approach for ambulance transportation from source to destination. The proposed system, ITLCS, provides the best path, clears the way for the ambulance, and switches traffic signals to green lights at the right time. ITLCS provides higher efficiency with a sub-graph map compared to using the original map, which reduces system running time and increases ambulance response speed. The ITLCS system can be applied to the map of any city that suffers from heavy congestion to manage traffic signals and improve ambulance response.