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DESIGN AND DEVELOPMENT *SMART-IMBULANCE* FOR EFFICIENCY OF ROAD EMERGENCY PRIORITIES

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Abstract
Medical emergency conditions required patients to be mobilized by ambulance quickly, precisely, and accurately. To save the patient, the ambulance acted as a helper and hope for the patient to survive until the patients reach the hospital. The ambulance has to go through the fastest and closest way to reach the hospital. However, problems arise when road conditions do not support the creation of the fastest and closest ambulance. Due to congested road conditions, it will be possible to delay the ambulance from reaching the hospital or other unwanted events. The road and traffic conditions that can be controlled for the smooth running of the ambulance need special attention. *Smart-iMbulance* framework modeling allows an ambulance to move quickly and precisely to reach the nearest hospital. This paper provides a transportation model for vehicles, an application model as an embedded program in an ambulance, and a traffic management plan as a solution offered for ambulances on the road.
Keywords: ambulance, emergency, smart traffic management.

INTRODUCTION

Ambulances have become the main transportation capital (*emergency medical services*) in the medical field to support mobile medical equipment by supporting patients in them. Generally, an ambulance is used in emergencies that require serious medical treatment [1]–[3]. More specifically an ambulance is a medical evacuation facility that quickly goes to health facilities [1], [4], [5]. It is not new regarding the role of the ambulance in dealing with emergency patients, especially in terms of time efficiency [6], [7].

Previous research that focused on ambulances both for medical treatment and regarding the efficiency of the ambulance reaching the hospital has become a special concern. Wajid et al. [8] reported their findings on optimizing the location of the ambulance for serious medical treatment managed to cut 22 minutes to 13 minutes for the ambulance to reach the scene. Fukushima and Moriya [6] use GPS to estimate the accuracy of an ambulance in handling emergency patients with congested road conditions in Japan. Chen et al. [9] using Dijkstra's algorithm for optimization of various route conditions in an emergency for the evacuation process.

The congested road conditions make it possible to disrupt the efficiency of the ambulance to get to the destination [6]. Besides, traffic that regulates vehicles also plays an important role in the smooth running of

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