ABSTRACT

THESIS: Emergency Response Time and Transportation Model to Improve Emergency Services in Henry County, Indiana, USA.

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Emergency services are very important in every society and that is why their activities should not be impeded by any avoidable barrier, especially with regard to transportation. One problem that is affecting the smooth running of emergency services in Henry County, Indiana is train movement across the county. The train tracks run through the county preventing road traffic flow when a train is crossing or has stopped. As a result, ambulances, police, or fire service vehicles have to wait for minutes or travel long distances to go around the train. This thesis focuses on developing response service areas maps based on the current response time and two models to generate shortest route around train obstructions. The data used for this thesis was provided by Henry County GIS Department, including shape files of police stations, police service areas, ambulance stations, ambulance service areas, fire stations, fire service areas, railroad and streets. The response service areas were designed based on the current response time. This was accomplished using ArcGIS network analyst extension which provides tools to design series of concentric circles based on the distance from the common center. Apart from the service areas maps for the emergency services which provide an idea as to where the services need to be extended in the county, the results of this thesis also include two models designed to generate shortest possible route as well as selection of a closest emergency facility to an incident site. The thesis could help improve the transportation aspect of emergency services in the county.