Smart Route Choice Based on Google Maps Application in Urban Road Network

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***Abstract*— Travel time within the city has the characteristics of many route choices and congestion tends to occur. Drivers often find it difficult to choose which route is the fastest. This paper aims to analyze route choice based on Google Maps in urban road network areas. The location of this research is the urban area of Malang City East Java with the origin and destination of the trip from the public transportation Arjosari terminal to the Malang Square. The method of data collection is done by using the Google Maps application to travel. Furthermore, the results of the field survey are compared with the predictions made by Google Maps. The results of the research show that the predictions of Google Maps with the of field surveys are not significantly different and the Google Maps application is suitable to be used as a smart route choice guide. Travel time obtained from Google Maps has shown optimal results.**

Keywords— Congestion; Google Maps; Road network*; Smart r*oute choice; Travel time

I. INTRODUCTION

Travel in urban areas has a complex road network system, both concerning the road network system, traffic conditions, urban activities, and the like [1]. To travel the driver is faced with a choice of many routes with various considerations [2] [3]. In addition to the many alternative routes, traffic jam conditions are a dilemma for drivers [4] [5].

Private vehicles need to choose the route that best suits the driver's wishes [6]. Meanwhile, public transport vehicles require a high level of trust because it involves perceptions and choices for passengers [7]. It is very important that route choice requires confidence and reliability for road users [8] [2].

The choice of route, in theory, has considerations of distance, time, and cost aspects. However, basically, it is enough for the driver to balance the aspect of time. The shortest time is representative of the desire of drivers who travel in urban areas. This is very relevant because urban areas have a very high potential for congestion. Therefore, the driver actually needs information about the condition of alternative routes that can be passed [9] [7].

The obstacle faced by road users is not updating information on the condition of the segment when traveling. Although road users have understood the various alternative routes, it does not guarantee that the route chosen is the right route to provide the fastest travel time. Whereas road users need to be sure which route is the most appropriate to choose. Thus, there really needs to be real-time dynamic information according to road network conditions so that destinations can be reached quickly [10] [8].

With the rapid development of information technology in the last decade, information technology and devices owned by the public have also experienced developments. One of the technologies that is developed and followed by the general public is a mobile phone that is accompanied by the Google Maps application. With the development of information technology and the Google Maps application in it is able to become a means of transportation. With this application, people are helped when traveling to choose the desired route. This is what is known as smart route choice using the help of the Google Maps application on mobile devices [1] [11].

The problem of choosing a route that has many considerations in urban areas requires alternative efforts. The number of alternative route choices on the urban road network and congestion in a certain area needs to get real-time and accurate information [9] [12]. This is important so that the driver can choose the route that best suits his wishes, which is the fastest route [11]. Therefore, choosing an easy and fastest route is a necessity for drivers in urban road network areas.

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