

Time Behavior Properties of Freight Transportation in South Sulawesi-Indonesia using Polynomial Regression Model

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Abstract: The present paper attempts to understand time behavior properties of freight transportation in South Sulawesi Province, Indonesia. This study focuses on three time attributes, i.e. arrival time, departure time, and travel time of the freight transport, where the number of trips of the time attributes is modeled using polynomial regression approach. The study conducts a freight transport survey using account and interview methods on seven areas in the capital city of the province. The modeling results show that the trip number related to the time behavior properties of each truck category mostly follow the polynomial model in orde-6. Further, the distributions of trucks have two peak-hour periods related to the departure and arrival time properties. In addition, travel time property is dominated by 15 – 30 minutes. The results provide an expectation in revising the demand model in order to explore the choice models of the time attributes in further studies.

Keywords: Time behavior, freight transportation, polynomial regression model

1. INTRODUCTION

Nowadays, the one main focus in Indonesia's master plan for 2011 – 2025 on enhancing and expansion of economy development is the development of freight transportation infrastructures (MP3EI, 2011). Regarding this, Indonesia government has been encouraging in studies on the development concepts of the freight transportation infrastructures. For example, studies on characteristics or behaviors of freight transport stake holders, demand models of inner and inter island freight transports, finances of the freight transport infrastructures, etc.

In context of the study needs on the freight transportation in Indonesia, many previous studies have been conducted. However, most of them were conducted for freight transport characteristics in Java, Sumatera, and Kalimantan islands. For instances, Ridwan (2012) in case Java island, Syahminan et al. (2011a; 2011b; and 2012) for freight transport in Sumatera island, and Mahmudah, et al. (2012) for characteristics of the freight transport in Kalimantan island. Only a few previous researches have focused on freight transport characteristics in Sulawesi island particularly in South Sulawesi Province. Two last previous researches only focused on the container terminal (Idrus et al., 2012) and container port (Dewa et al., 2012) characteristics of the Makassar Port, South Sulawesi, Indonesia.

In order to contribute on the development of the freight transportation South Sulawesi Province, the present study attempts to grasp the time behavior properties of freight transportation in the Province such arrival time, departure time and travel time using

of South Sulawesi Province in Indonesia such flow rate of the freight vehicles, commodity types, load capacity of trucks, and three time attributes, i.e. departure time, arrival time, and travel time, have been elaborated in this study.

The flow rate of the goods for small and large trucks, and also pickup vehicles showed the significant potency in the development of the freight transportation system in South Sulawesi. Its indicated by the commodity demand of the freight transport is available in the large number of the agriculture commodities, forest commodities, etc. in South Sulawesi Province. However, the condition of the truck modes has given prospects to develop and improve the road network infrastructure of the freight transport in the area in the future.

Specifically, the modeling results of the three time attributes of the freight transport operation in South Sulawesi, also have given a chance in revising and developing the better models for the prediction models of the departure time, arrival time, and travel time based on the stake holder behaviors of the freight transport in the further studies in the future.

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