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Analysis of The Possible Use of Park and Ride for Tram and Monorail to Facilitate The Air Travelers Based on Sub-District Area

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Abstract

Park and ride system will be introduced in the transportation system of Surabaya city as the part of facilities provided for tram and monorail network. The location of park and ride are distributed in some sub districts of the city. This study's aim is to seek the possibilities of utilizing those park and ride to facilitate air travelers from the city. The analysis is focused on the comparison on the difference of travel time and travel cost if the air travelers utilize the facility of park and rides available. To achieve this objective, the period of analysis has to be determined due to the operational characteristics of park and ride system and the flight schedule as well as route serviced by the airport. The selection of the sub districts that may travel to the park and ride locations is considered to be another important aspect. The result shows that the travel time and travel cost of air travelers who stopped by at park and ride tend to be higher than direct travel from home to airport.

Keywords: Park and Ride; Airport; Travel Time; Travel Cost; Airplane Passenger

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1. Introduction

Park and ride is an alternative transportation solution, which its aim is to reduce auto usage and increase vehicle occupancy in the city center. This park and ride provides an alternative to auto use through public transportation and carpooling (JTA, 2009). Theoretically, park and ride provides some benefits, such as cost saving to users, travel time savings, peak period traffic reduction, reduced auto emissions, and enhanced mobility as well as improved transit system efficiency (JTA, 2009).

Surabaya in facilitating the mobility of people also has planned park and ride facilities to support the development of tram and monorail system. It is interesting to know whether the designed park and ride facilities will be useful for air traveler from the Surabaya city. Air travelers face a problem related to quality of transportation access to airport. It is become a trend that the land travel time becomes longer than the air travel time (Ashford et al, 2011). For example, Juanda International Airport is an airport in Surabaya, Indonesia, is the second busiest airport in Indonesia. One of the access road to the airport is Jalan Ahmad Yani, which has very congested road. The high density (DS) road during morning and afternoon peak to the South (airport) direction reaches 1.29 and 1.5 respectively. The reverse direction of Jalan Ahmad Yani has DS 1.37 and 0.99 for morning and afternoon peak respectively (Buana and Prakoso, 2013). This high level of DS represents the congested access road to the airport.

The air travelers expect to have high reliable transport system to the airport to avoid missing their flight. The plan to have park and ride facilities drive an idea to find out whether those facilities will also bring benefit for the air travelers who leave near park and ride location. The challenge is to determine the travel time and travel cost that need to spend for both direct travel and using park and ride facilities.

The study of park and ride has been conducted is some cities in the world. One of those is in River Valley regions (2009). The purpose of this study is to evaluate the existing Park and Ride facilities throughout the region and develop a plan to identify and address existing and future needs and to ensure a continuous and adequate supply of parking for rideshare commuters, includes: (1) a detailed inventory of existing official and unofficial park and ride lots in the region, (2) performance measures of each site to determine its effectiveness and usefulness, (3) recommendations and strategies to improve the connectivity and inventory of park and rides in the area. This study supports the research aim in analyzing the use of park and ride for air travelers. The more the usability factors of transport facilities the more efficient the transport system in the region.

2. Review on Research Related to Park and Ride System

The use of park and ride may not meet the expectation as it's designed. Some people consider that using park and ride is more unlikely since they have higher income and driving experience quite long. For this group of people, driving in congested area is not an issue (He, 2012).

People also tend to bring their car through the congested area once they know that the facilities in the park and ride are not appropriate (Ando, 2012). However, the opposite situation was applicable in Shanghai, China (Gan and Qing Wang, 2013). The utilization rate of park and ride Shanghai is very high. The number of lonely driver prefers to use park and ride compare to the long distance trip. The change of this driving behavior affect to the quality of air. Due to the reduction in number of cars, the production of emission is also reducing. According to Gan the reduced emissions for pollutants CO, NOx and HC are 21.7 ton, 1.2 ton and 1.8 ton respectively for 250 work-days each year.

Park and ride become an attractive solution when the urban landscape support the need of park and ride (Olaru et el, 2014). More than 90% of residents live outside of 800 meters. Those people have their own preferences, one group prefer to the station with good facilities and the other choose the shortest access to the rail station (Chen et al, 2015). The potential of accepting park and ride system is also determined by the characteristics of people surrounded the parking area (Buchori, 2015)

3. Methodology

This study is aimed to determine the usability rate of the designed park and ride facilities in Surabaya for air traveler. The analysis considers flight schedule to select the period of travel time and travel cost analysis. Location of the park and ride station from the sub districts of Surabaya also one variables need to be considered. These two variables are the main factors in determination of park and ride demand for air travelers.