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## Land use development and its impact on airport access road

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### Abstract

Land use development is following the needs of the community in a city. The development of land use and those usages could be difference from the Master Plan of the city. This may occur subject to the new policy or some new idea to adopt any general tendency of global change. The changing of land usage drives unmanageable traffic movement due to changing traffic generation or attraction of the new land use. This situation will increase travel time of the road network. The impact of increasing travel time is more affected to air travelers; increasing travel time in the access road to the airport may cause the lost of their flight. This research attempts to determine how much difference of travel time of road access to the airport from time to time that is caused by changing of land use. The result shows that the number of alternative routes to the airport is increased from six to eleven in year 2009 and 2014 respectively. However, the increasing number of access route is not followed by the reducing of travel time. Only two routes out of 11 that have less travel time from 2009.

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## 1. Introduction

The development of land use in Surabaya city grows rapidly and is not always accompanied by a change and a good road network arrangement. The development is also influenced by the level of the economy in a region which should be supported by the development of infrastructure and transportation planning. The developments of infrastructure and transportation system, sometimes, are left behind of the growth of centre of activities.

This situation causes increasing travel time and delay due to the number of traffic that occupy some routes in Surabaya. These routes are the share routes to Juanda International Airport.

Juanda international airport is a gateway for air traffic with total area 477,3 ha and equipped with 2 terminal buildings that can accommodate about 12,5 million passengers per annum. The high demand of air transportation is generated from all area of Surabaya city. These air travelers demand the high reliability of travel time along the airport access road.

The problem arises when the development of land use along the airport access road is not balance with the development of transport networks and systems. The route access serves numbers of travelers generated or attracted from the new land uses. These influence traffic movements to and exit from the airport. This research attempts to determine the difference of travel time of airport access routes that is caused by changing of land use.

### 1.1. Preview Changing of Land Use in Surabaya City

Development of urban areas follows the characteristic of inter-regional imbalance development and unequal distribution centre for community services. Those generate the problem as follows: the tendency of concentration of activities in certain areas (over concentration), mixed land use, land conversion of green and open spaces become awakened intensive region (residential, industrial, offices, infrastructure). In the last period, Surabaya City has conducted various development to meet the needs of the community along with the increasing number of population (Rianelly, Hariyanto, Sari, 2009). The following is a description of a gradual development of land use and road network in the city of Surabaya in year 2009 and 2014.

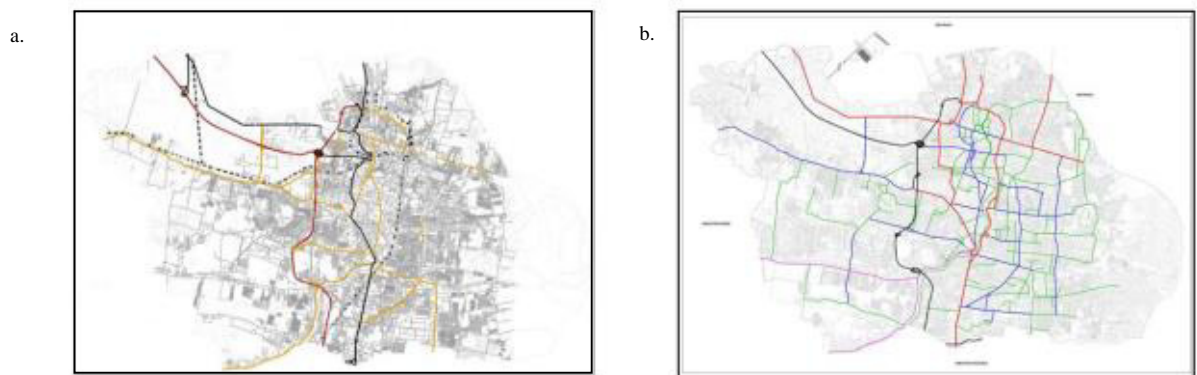


Fig 1. Road Network Map in Surabaya 2009 (Pratiwi, 2009) and 2014 (BAPPEKO, 2014)

(a) Road Networks 2009; (b) Road Networks 2014

Figure 1 shows the use of land in the Surabaya City move horizontally dominated by residential area. Changing of land use also is followed by the development of the road network in the region causes an increase in activity due to the mobilization of the people. Figure for year 2014 illustrates the development of the region of West and East of Surabaya for both land use and transportation networks.

The development of road network in year 2014 indicates the changing in land use. The road networks facilitate the mobility of people in new development area. The area for housing for the last 20 years increases around 64.4% (Wahid et al, 2012). This means that the transportation system is not sustain since the number of traffic also increases. The quality of travel in the urban area is also affected, as well as the access to the airport. The accesses to

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