



Potential Residential Area in Urban Transportation System: Taking into Consideration of Accessibility and Air Quality

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ABSTRACT

Accessibility and air quality as two main urban infrastructural elements in urban transportation system, should be analyzed and investigate their impacts. This paper focuses on the geospatial method in identifying the potential residential area and provides explanation based on the mathematical relationship between accessibility and urban air quality. The relationship has been represented as optimum distance between residential area and urban transportation network. The mathematical analysis would assist in providing a better planning for urban transportation. The spatial data (on the urban land-use and urban network development) were generated using satellite images, aerial photos and land use maps. Geospatial analyses were performed to find the effect and impact of urban air quality with respect to urban transportation networks. The main finding of this research is a mathematical model, with about 90% accuracy, can be applied for the study area to find optimum distance from roads to avoid air pollution. Exploring potential locations for residential land use development as series of suitability maps to show current suitable and potential locations for future development is another finding of this research. Series of maps and quantitative parameters analyzed to find some area with good accessibility and air quality. The results show 66 % of study area has good accessibility and 20% of study area has potential for air pollution. The potential polluted areas are mostly located in residential landuse. Combination of accessible and non polluted areas with vacant lands and current residence areas show that 60% of current residential area are allocated in good accessible and air quality locations and with current transport network, 8% of study area has potential to develop for future. The output of the study would assist the task to reduce negative transport environmental impacts particularly in the field of air pollution. It would be useful in the identifying the potential residential area with respect to urban transportation network towards achieving a sustainable development.

Key words: Accessibility, Transportation System, and Air pollution

1. INTRODUCTION

The establishment of urban land-uses in portion to the urban transportation network is seemed to be very much important. Increasing demands for residential area along with the development of cities in recent years has brought in some complex issues [1]. One of the most important problems in the urban planning is location and accessibility of residential areas to the main public facilities.

With respect to this issue, increasing urban land-uses had given several impacts to various fields such as air quality, accessibility and land use. As such, the air quality has been considered as one of the major environmental elements by any urban planners [2-3]. Therefore, there is a need to look into the urban transportation planning together with the land-use development.