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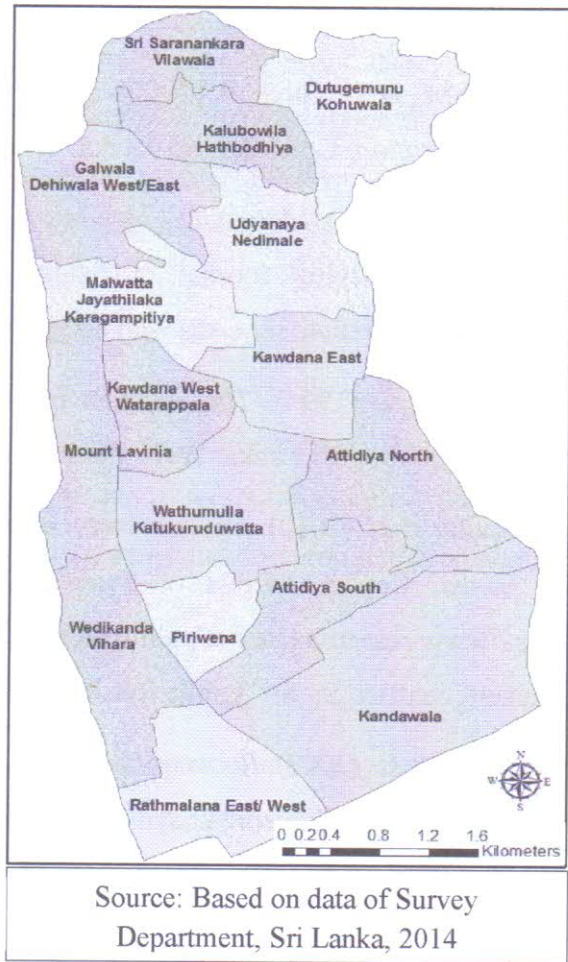
A SPATIAL ASSESSMENT OF TRAVEL BEHAVIOUR OF DEHIWALA-MOUNT LAVINIA MUNICIPAL COUNCIL AREA

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Introduction

Transportation, being a crucial component of the contemporary society, also seems resulting negative influences such as increased traffic congestion and adverse environmental impacts. They have been caused mostly by changes in travel behaviour and land use changes. Travel behaviour changes because of various factors including existing land use and transportation network. Particularly, a messy urbanization is observed in this region which is characterized by a ribbon development (World Bank, 2015). Density, diversity and design of the land use system and service level/quality, availability and affordability of transport system collectively influence on shaping the

Figure 1: Study area



travel behaviour in a particular region (Silva & Pinho, 2006). All these factors are interrelated and studies on these interactions are appreciated both in land use and transport planning. Wegener, 2004 identifies that trips and location decisions co-determine each other and therefore transport and land use planning needed to be coordinated. Hence it is timely important to study travel behaviour patterns in urban

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context in order to plan for minimizing above mentioned issues which are emerging considerably in Colombo city and suburbs.

This study focuses on the travel behaviour of Dehiwala-Mount Lavinia municipal council (DMMC) and their shaping factors since DMMC is the second largest Municipality in Sri Lanka, and it covers an extent of 2109 hectares. DMMC is composed of 29 wards and is a combination of certain key urban suburbs and communities combined for administrative purposes. This municipal council accommodates a population of 245, 974 in 2012 according to Department of Census and Statistics. Therefore, DMCC area is selected for studying the travel behaviour patterns and determining factors, that the outcomes of the research can be utilized for transport and land use planning in this urban area in order to minimize the accompanied issues.

Objective

The objective of this study is to examine travel behaviour of the study area and explore factors that determine these behaviours.

Methodology

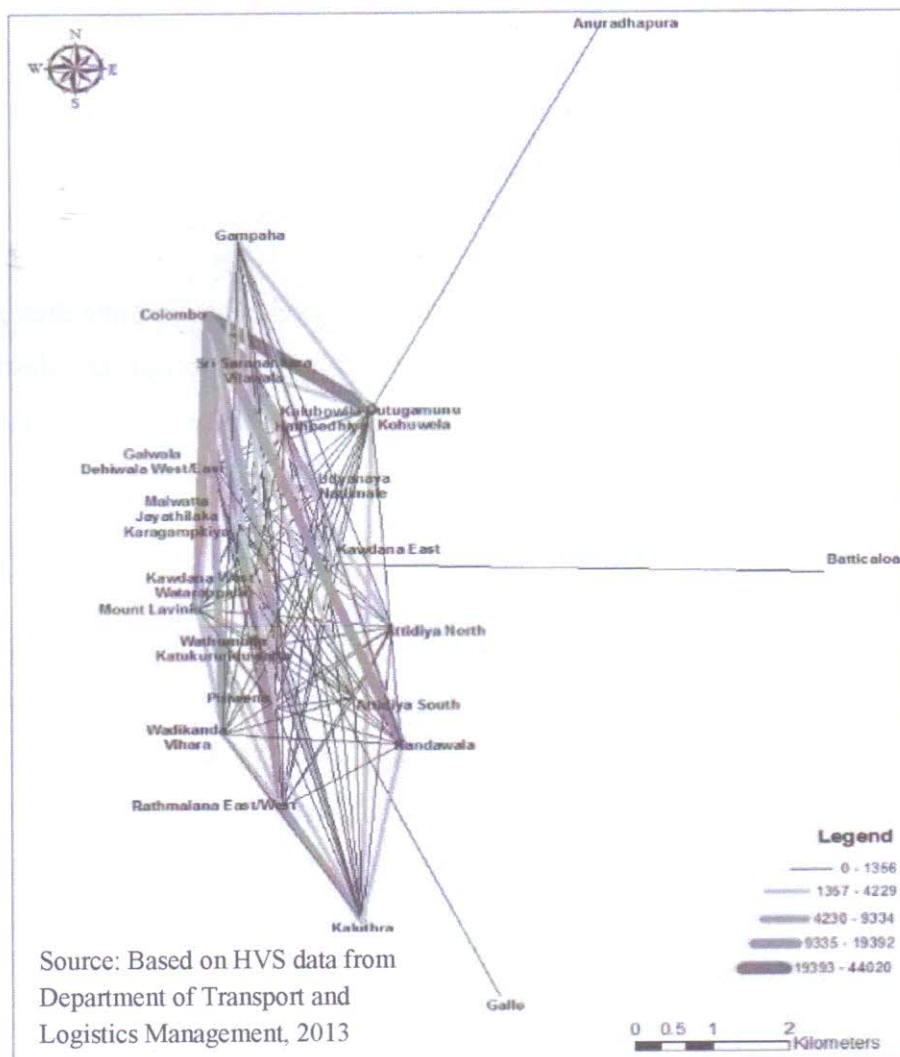
This study is mainly based on two aspects including travel behaviour and their shaping factors. Accordingly, travel behaviours are assessed based on origin and destination, transport modes, trip purposes, travel time and distance. The data of the Household Visit Survey (HVS) collected in Western Province, Sri Lanka in 2013 (Department of Transport & Logistics Management) are used to analyze travel behaviour. Land use data and road and rail network data set collected by the Survey department (2013), Sri Lanka will be used to examine shaping factors of travel behaviour together with HVS data. Population and housing data collected by the Department of Census and Statistics are also used to identify whether there is a significant spatial pattern of population density and travel patterns. In this study the trips originated from study area and ended inside or outside study area, trips ended in study area and originated inside or outside study area were considered in identifying travel patterns. Study area is divided into traffic zones and travel patterns within the study area will be measured accordingly the traffic zones, whereas all outside locations were collectively summarized based on Districts. Accordingly, only the districts where, trips begin at those districts and end at

study area and districts where trips end but, begin at study area within the day was considered in the study. Desire lines, overlay analysis in Geographical Information Systems were mainly utilized in thematic and descriptive analysis other than Excel based descriptive analysis including OD matrix.

Results and Discussion

Most of trips can be seen between Kohuwala/Dutugamunu area and Colombo while trips between Colombo and Kandawala/ Rathmalana and Mount Lavinia also show significantly higher. Trips occurred within the traffic zones inside the DMMC are less than the trips that were started in the study area and ended outside the DMMC (Figure 1).

Figure 1: Origin and Destination map of the trips



Majority of trips originated in the study area are residential type followed by educational facilities, government, public, private and business offices and medical facility. Overlay results of land use maps and travel behaviour maps ensure the fact that most of the trip origins and destinations are in accordance with land use type.

Majority of land area of DMMC accommodates considerable amount of home gardens showing higher number of residential purpose-oriented trips. More medical facilities and educational facilities have attracted more medical and educational trips. Furthermore, high trip densities are highlighted in areas with higher population density. Location of railway lines and road network also act as determining factors in deciding transport mode. Accordingly, most of the people located in closer proximity to railway lines use rail as their main transport mode and others are less likely to use rail for transportation.

And also, most people allocate more travel time for working and private matters. Lesser travel time is spent on school, shopping and business purpose trips. Yet, least average travel time have been consumed for home purpose. This may be because of trip chaining. They might be attending for other trip purposes such as shopping or any other private matters, when they are going home after fulfilling their main purpose (Srinivasan, 2000).

Conclusions

In conclusion, DMMC division is mostly a residential area. Land use factors and transport system factors impact in determining travel pattern of the area. Accordingly, mode choice depends on the trip purpose, travel distance and road network of the area. People use trip changing practices in order to lessen travel time and distance for home-based trips. It can be concluded that travel behaviour of people will affect on the land use in the area as well, on the other hand land use also make a significant impact on decisions related to travel behaviour. Hence it is mandatory to consider these findings to understand the interaction of these factors and plan the area accordingly to reduce urban transport issues in the region. Further it is recommended to study on the temporal changes of land use and travel patterns to ensure temporal changes of the travel behaviour of the area and to examine whether the changes in the land use have impact on travel behaviour changes.

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