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Study on the Relationship between Road Network and Commercial Property Values

in Matara Municipal Council Area

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The work described in this dissertation was carried out under the supervision of Prof. R.G. Ariyawansa, professor of Department of Estate Management and Valuation and any report on this has not been submitted in whole or in part to any university or any other institute for another degree / examination or any other purpose.

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Hereby, I certify that Mrs. P.D.D.S.Muthukumarana, (GS / M.Sc / REMV 3767 / 09) duly completed the research titled "Study on the Relationship between Road Network and Commercial Property Values in Matara Municipal Council Area" under my supervision.

Also it is declared that, this final report has been completed according to the instructions and suggestions made by the board of examiners.

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Signature of the supervisor

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Signature of the 2nd examiner

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Signature and the official stamp of the Head of the Department

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ABSTRACT

According to the volume of literature a number of factors affect commercial property values. These include, institutional factors, economic factors, location, transportation, road transport network, political factors, planning regulation, environmental quality, size of catchment area and growth pattern of land use, While little or no consideration has been given to the road network pattern and its effects on values of commercial properties.

In this study, the main objective is set to study the relationship between road network and commercial property values in Matara Municipal Council area. Secondary data was collected from relevant Authorities. Primary data was collected through a questionnaire from the occupiers of commercial properties along the selected roads within study area.

Total of fifteen roads in the study area were used in the analysis of the road network. The population of occupiers of commercial properties was estimated based on total number of commercial properties along selected roads and it was decided to select 271 commercial properties as the sample with respect to 95% confidence interval level allowing for 5% margin of error and 50% response distribution.

Multiple regression analysis and step-wise regression analysis were used to measure the relationship between road network and commercial property values. The results obtained in the regression of each variable individually and commercial property values showed that accessibility returned a coefficient of correlation the significant of these two variables is .707, width .869, connectivity.631 and connectivity .492. This indicates that there is statistically significant relationship between road width, accessibility, connectivity and commercial property values in the study area and that the variable contributes 70.7%, 86.9%, 63.1% and 49.2% respectively of variability in commercial property values.

Finally step-wise regression analysis returned three variables accessibility ($P<.05$), width of road ($P<.05$) and connectivity ($P<.05$) as the variables that actually greatly affect the commercial property values. The R^2 statistic indicates that the model as fitted explains .902 of the variability in the values of commercial properties in the study area and has statistically significant relationship with the commercial property values.

The findings of the study revealed that accessibility, road width, connectivity and the road length have significant relationships with models to assist valuers, property developers in expressing valuation opinions, and predict commercial property values especially in feasibility and viability appraisal, While it recommended that the road network be improved to enhance values of commercial properties to benefit government, owners and occupiers of commercial properties in the study area.

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CHAPTER ONE

Introduction

1.1. Background of the Problem

Man, nation, regions and the world would be severely limited in development without transportation which is a key factor for physical and economic growth of a country (Oyesiku, 2002).

Road network consists of large number of interwoven roads exhibiting many patterns ranging from star-like to grid-like irregular patterns becoming recognized (Zhang and Lund University, 2004). It consists of large amounts of roads that interweave with each other to exhibit a pattern. Patterns are defined as characteristics and properties found in repeated and regular manner with one object, or between a number of objects with such repetition in the form of shape, density, distribution, linkages, connection or orientation. These occur among the same kind of objects, different kinds of objects or within an object, or between objects repeated with sufficient regularity. Such repeated properties may be shape, orientation, connectedness, density or distribution. The frequency of such pattern enables development of prototypical views of geographical process (Mackaness and Edwards,2002).

Road networks are observed in terms of its components of accessibility, connectivity, traffic density, level of service, compactness and density of particular roads. Level of service is measured by which the quality of service on transportation devices or infrastructure is determined and it is a holistic approach considering several factors regarded as measures of traffic density and congestion rather than overall speed of the journey (Mannering, Walter and Scott, 2004). However in estimating value of individual property this type of holistic approach is not considered usually. By doing this research an attempt was made to identify all major factors on road network that has been affected to the valuation of individual commercial property instead of considering accessibility.

According to Bailey, Mokhtarian, and Little (2008), transportation route is part of distinct development pattern or road network and mostly described by regular street patterns as an indispensable factor of human existence, development and civilization. The route network coupled with increased transport investment result in changed levels of accessibility reflected through Cost Benefit Analysis, savings in travel time, and other benefits. These benefits are noticeable in increased catchments areas for services and facilities like shops, schools, offices, banks, and leisure activities. This caused increase in demand for commercial space and its concomitant effects on property values along roads in the cities.

Access to major roads provides relative advantages consequent upon which commercial users locate to enjoy the advantages. Modern businesses, industries, trades and general activities depend on transport and transport infrastructure, with movement of goods and services from place to place becoming vital and inseparable aspects of global and urban economic survival. Developments of various transportation modes have become pivotal to physical and economic developments. Such modes include human porterage, railways, ropeways and cableways, pipelines, inland waterways, sea, air, and roads (Said and Shah, 2008).The competition for locations with good urban transport and transport infrastructure usually results in an increase in land and housing values, either sales or rentals (Harvey, 1993).

Wyatt (1997) states that urban areas have tendency to develop at nodal point in transport network and places with good road network will possess relative advantage over locations having poor network. Urban locations with such relative advantage are found where different transport routes converge with high degree of compactness, connectivity, density, length and accessibility exhibited within the intra- and inter-urban road networks.

Some works by Kivell (1993), McQuaid and Grieg (2003), focused mainly on movements of people, goods and services with reasons proffered for such movements in terms of inter-linkage of various modes of transportation, accessibility in terms of distance, urban rent, highest and best use, friction and their impacts on land use and property values. While Omoogun (2006) noted that accessibility has great impact on

property values and properties located at the point where two or more roads meet command greater value than those located off the nodal points or major roads. This assertion, however, lacks empiricism and the conclusion based on intuition, which this study will resolve.

According to Aderamo (2003), road network constitutes an important element in urban development as roads provide accessibility required by different land uses; and proper functioning of such urban areas depends on efficient transport network, which is backbone to their very existence. The analysis of the road network involves recognition of the patterns and qualities of the roads, which can be emphasized through process of abstraction and symbolization

Table 1.1 Determinants of commercial property values

S/N	Factors	Rate	Percentage(%)
1	Location(proximity to main bus stand & other important places)	44	88
2	Accessibility (nearness to road)	27	54
3	Road Network (that makes movement easy)	25	50
4	Degree of Obsolescence	12	24
5	Physical Attributes of Properties	11	22
6	Quality of Roads (motorability, tarred surface, width of road, etc.)	10	20
7	Nature of Business – goods/ services that are provided to clients	10	20
8	Negative Externalities (Spill-over effects as pollution)	10	20
9	Competition amongst & between different types of Commercial Uses	10	20
10	Improvement in Transport Facilities	09	18
11	Government Policy	08	16
12	Traffic (which increase/ decrease customer benefaction)	07	14
13	Relationship between Landlord and Tenant	06	12
14	Institutional Factors(relating to people's culture and religious belief)	06	12

Source: Compiled by Author 2013