

**TO IDENTIFY THE IMPACT OF THE NEW
SOUTHERNEXPRESS WAY (SEW) ON THE LAND USE
OF INTERCHANGE AREAS BY APPLYING THE
CELLULAR AUTOMATA MODEL**

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08/9611

Degree of Master of Science in Town and Country Planning

Department of Town and Country Planning

University of Moratuwa

Sri Lanka

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Dissertation submitted in partial fulfillment of the requirements for the degree
Master of Science in Town and Country Planning

Department of Town and Country Planning

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April 2014

DECLARATION

I declare that this Research Project represents my own work and this thesis does not incorporate without acknowledgement any material previously submitted for a Degree or Diploma in any other university or institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text.

I wish to also declare that the total number of words in the body of this report (excluding endnotes and references) is 15000.

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CERTIFICATION

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ABSTRACT

Urban Development is a significant global phenomenon with the conversion of natural land to urban uses. It is a complicated process involving the spatiotemporal changes of all socio-economic components and physical components at different scales. These physical components of urban growth are related to spatial expansion, land cover changes and land use changes.

Particularly in Sri Lanka, it is revealed that most of the urban centers are growing around road intersections due to relatively good accessibility and other services. Population flows in to urban areas. In this process, some locations have grown faster than the others.

The National Physical Plan & Policy of Sri Lanka has introduced few expressways to the country and some of them are constructing, implementing and being functioning.

As a novel project of the country, when they are functioning in Sri Lanka, land in the interchange areas would have a demand for various activities while the rest of the road is access controlled. Therefore it is expected to have a rapid conversion of lands in interchange areas and relatively higher rate of growth of urban development in adjoining urban centers with a spatial expansion and land use changes.

As a case study of express ways; SEW, the government also has undertaken measures to direct development activities in interchanges by preparing Area Development Plans which provide a growth directions and development guide lines under the Southern Transport Development Project (STDP) for each of the interchanges along the corridor.

In the context of urban development, major theories and approaches conventionally applied in urban development modelling, and the strengths and weaknesses associated with each approach. But several studies have been conducted to understand the urban growth phenomenon that have focused on quantifying, measuring, monitoring, managing, modelling and predicting urban growth.

Therefore, main objective of this study was to identify the Land Use Changes of the Interchange areas of Express Ways with Cellular Automata by applying the cellular automata model.

The Surroundings Kurundugahahethekma and Galanigama Interchanges areas of the Southern Express Way were selected as the case study areas which are covered by the 1.5 km radius of the Interchange Area for this study. After calibrating the model, the result is shown that the urban land use are increasing while the non urban are being decreasing.

The changes in range by the spatially and the time periods, there has been more influenced on the interchanges areas affecting Express Ways which has been built in recent time. With the flexibility of implementing transition rules, planners and decision makers can use the model to test various planning options to answer their “what if” questions. Further, the model can be applied and used in developed and detailed analysis such as land use categories and 3D analysis.

Key words: *Express ways, Cellular Automata, Urban Development, Accessibility*

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List of Abbreviations

Abbreviation	Description
SEW	Southern Express Way
STDP	Southern Transport Development Project
GIS	Geographical Information System
UDA	Urban Development Authority
CA	Cellular Automata
MA	Multi-Agent
DS	Divisional Secretariat
GN	Grama Niladhari