McGill
Urban Planning
Civil Engineering

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INTRODUCTION

Urban Systems Laboratory (USL) explores the inter-dependencies among the interrelated urban systems to facilitate the planning and development of prosperous and sustainable cities. USL addresses this task by adopting an urban systems approach, which facilitates the study of interconnected urban sub-systems such as housing, employment, transportation infrastructure, etc. USL brings the above-mentioned sub-systems into a coherent analytical framework, therefore helping planners and engineers understand how one urban sub-system influences another, while simultaneously being influenced by other sub-systems.

Understanding the interdependencies between land use and transportation in Montréal in particular enables us to alleviate traffic congestion, urban sprawl, and transportation-related GHG emissions. At the heart of the USL are comprehensive computer models that reproduce the complex and dynamic relationships, which sustain the development of urban areas.

Macdonald-Harrington Building

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Le Laboratoire des Systèmes Urbains proposé facilitera la planification et le développement de régions urbaines durables en explorant les liens entre l'utilisation des sols et les transports dans la région de Montréal. Cette exploration adoptera l'approche des systèmes urbains, étudiant les interrelations de sous-systèmes urbains tel le logement, l'emploi, et l'infrastructure des transports. Le projet proposé entreprendra une étude exhaustive des régions urbaines basée sur l'analyse simultanée de la dynamique des lieux de travail de d'habitation en parallèle avec l'évolution des réseaux de transports au niveau métropolitain.

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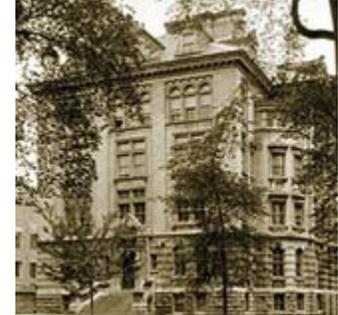
ABOUT US

Systematic Analysis of Land Use Transport and Equity (SALUTE) Group is working on developing the models in the Urban Systems Laboratory.

Affiliated faculty and researchers:

1. Professor Madhav Badami, Ph.D. (email, website)
2. Professor Murtaza Haider, Ph.D. (email, website)
3. Dr. Mike Mahut (email)
4. Dr. David Simmonds (email, website)

USL is located on the 4th floor of Macdonald-Harrington Building in McGill University.

METHODOLOGY

SALUTE Group's approach to urban systems modelling is not only focused on sustainability and urban form, but it also accounts for social justice and equity. Thus the empirical models are designed to evaluate the impacts of proposed development alternatives and policies on the welfare of low-income households, the elderly, and disabled individuals. Research in urban form has maintained an exclusive focus on promoting sustainable urban areas.

Our methodology acknowledges the fact that certain alternatives that promote sustainability and efficiency may have adverse impact on social equity. For example, a toll highway may reduce travel demand and may result in less traffic congestion or emissions, but it may also restrict the accessibility of low-income households that often cannot afford to pay tolls. Similarly, urban growth boundaries may limit urban sprawl; yet at the same time such boundaries may increase rents to unaffordable levels for many low-income households.

The land use, demographic, and economic models are being developed in the Delta ® modelling package. Region wide travel demand models have been developed in TransCAD ® modelling package, whereas the mesoscopic traffic models are being developed in Dynameq ®.

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