A Methodology for the Evaluation of Urban Form Indicators for a Small Metropolitan Region

Using an Integrated Land Use and Transportation Simulation Model

By
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Wednesday, August 14, 2013
Seminar: 11:00 am, Johnson House, Conference Room
Defense: 12:00 pm, Johnson House Conference Room

Committee
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ABSTRACT

Chittenden County's urban form has been evolving as a result of population growth and resettlement. Concerns have been raised by community stakeholders over the proliferation of urban sprawl. Methods for quantifying and assessing the existence and/or extent of urban sprawl have been hampered by a lack of consensus regarding the definition of sprawl and, consequently, methods for measuring it. This has created barriers for communities to effectively monitor and plan for the effects of regional changes in urban form that could aid in prevention or mitigation of undesirable outcomes associated with sprawl.   The primary objective of the thesis is two-fold: to investigate previously developed urban form indicators and associated methodologies; and, to develop a methodology for determining a selection of metrics that would be appropriate for quantifying urban form in the context of the small metropolitan region of Chittenden County, Vermont.

Investigation into previously used indicators focused on the application of landscape metrics to the study of urbanization and sprawl. A synthesis of 33 peer-reviewed articles identified the variety of methodological approaches applied using landscape metrics, and provided a critical assessment of the identified methodological gaps with corresponding recommendations for future research. A variety of metrics were then applied to a set of forty simulated land use development scenarios for Chittenden County, Vermont simulated for the years 1990 to 2030. The appropriateness of the metrics were then assessed based on regression analysis that tested the relationship between each of the metrics and the county-wide measure of vehicle miles traveled.