

# Urban Fragmentation and Energy Consumption Patterns from Commuting in the Baltimore Metropolitan Area, 1990-2000

Rob Neff  
University of Maryland Baltimore County  
neff@umbc.edu

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## **Abstract**

This paper applies the concept of consumptive landscapes, a metropolitan-scale geographic lens through which to view the energy consumption, to the question of if and how urban sprawl and energy consumption are linked. A traffic assignment model was applied to commuter origin-destination data, and the results were used to generate GHG emissions maps for two time periods - 1990 and 2000. These maps were used to define urban and suburban realms in the Baltimore metropolitan area most responsible for energy consumption during each time period. Several indices of sprawl were then calculated for emissions hotspots to identify and characterize employment centers and residential areas with similar emissions profiles.

The results were compared to investigate the role that changing urban form and structure have played in shaping Baltimore's consumptive landscape. These results demonstrate that consumption of gasoline is linked to Baltimore's dynamic settlement patterns, which can be linked to complex dynamic patterns of suburbanization and sprawl alongside seemingly contradictory patterns of reurbanization and gentrification. These findings suggest that the urban form and structure of the Baltimore metropolitan area are much more complex than can be described using the dominant urban/suburban dichotomy, and that the fragmentation of post-industrial North American cities associated with globalization and changing modes of production have emerged as new drivers of energy consumption in the transportation sector.