

A Geographically Disaggregated Model of Urban Settlement Patterns

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A geographically disaggregated model of urban settlement patterns explains several aspects of urban growth and development. Why do cities tend to have a dense commercial core? Why does limiting density of the central core increase unemployment? Why doesn't increasing highway capacity shorten commute times? What determines the diameter of a city? What determines its population? Why aren't self contained, mixed-use neighborhoods, where people live and work in within walking distance, a feasible pattern for urbanization? How does the expansion of commuter rail affect development patterns?

The model tracks population, jobs, housing, employment, unemployment, commute times, and congestion in a generic urban area. The availability of jobs, labor, housing, and business space, along with density and commute time drive migration of people and business. The array-based algorithms that match available workers with available jobs across multiple geographic subdivisions can be applied in other modeling situations.