Diagnostic the Spatial Structure of the Urban Areas of Lawrence, KS Using Space Syntax & GIS

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What is space syntax?

- Space Syntax is a set of theories and techniques used for describing the spatial configuration of the built environment and for explaining how it functions.

- Space Syntax was conceived by Bill Hillier and his colleagues in the 1970s (London).

- Urban analyses using space syntax are based on re-representing all streets and open spaces of an urban system as an “axial map”.

- An axial map is defined as the least number of longest straight lines (also called ‘axial lines’) that cover all streets and open spaces of a urban system.

- Space Syntax provides metrics describing the relational properties of the axial map, which then can be used for characterizing urban structures.

- Numerous studies in widely different fields have used space syntax measures to describe, explain, and predict spatial, social and cultural functioning of the built environment.
Traditional approach of drawing and calculating axial map

Axial map
A fictive urban system

connectivity graph
Drawing the Axial Map of Lawrence KS

The Axial Map of Lawrence consist of more than 1700 Axial lines
Axwoman is an analytical tool based on space syntax theory that provides urban morphological analysis capability to GIS users.
Axial map of Lawrence

http://www.mapcruzin.com
Output data of the spatial analyses of Lawrence axial map using Space syntax into GIS are:

Graphs, Tables, and Scatter
The Connectivity of an axial line measures the number of lines that directly intersect that give the inverse connectivity values of the immediate neighborhoods of this axial line.

The control value of an axial line is given by the sum of the inverse connectivity values of the immediate neighborhoods of this axial line.

**References**


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- Mahbub Rashid, *Course on Morphology, School of Architecture, University of Kansas, Spring 2010*