

## **Bending the axial line:**

### **Smoothly continuous road centre-line segments as a basis for road network analysis**

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#### **Abstract**

This paper presents the use of smoothly continuous road centre-line segments – which are here termed strokes – as a useful basis for the analysis of street and road networks. The decomposition of networks into linear strokes, which show good continuation of direction and continuity of character (width or type), has been found to provide a basis for robust, effective, and efficient automatic generalisation of road networks. Network generalisation and space syntax are shown to have similar requirements for understanding the importance of individual elements in the network structure. Stroke-based network generalisation employs structural analyses based on space syntax methods. The idea of replacing axial lines with strokes as the basic spatial representation in space syntax is presented. It is suggested that in spaces where linearity is dominant, in certain contexts such as traffic flow studies or when curved routes must be handled, stroke-based space syntax could offer definite computational and modelling advantages over the conventional use of axial lines.

#### **Keywords**

Space syntax, axial line, strokes, network analysis, generalisation  
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