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### **Full Paper Abstract**

**Verna Nel**  
**Professor**  
**University of the Free State**  
**Urban and Regional Planning Department**  
**083 657 2865**  
**Tel: (051) 401 2499/2486**  
**Fax: (051) 444 6550**  
Email: [nelvj@ufs.ac.za](mailto:nelvj@ufs.ac.za)

**Darren Nel**  
**Assistant Lecturer**  
**University of Pretoria**  
**Dept. of Town & Regional Planning**  
**Cell: 072 562 3655**  
Email: [darren.nel@up.ac.za](mailto:darren.nel@up.ac.za)

### **Title: An exploration into urban resilience from a complex adaptive systems perspective**

Resilience is defined as the ability to recover from a setback. It is also one of the attributes of a complex adaptive system. A system comprises a set of parts, entities or agents whose relationships determine the nature of their organisation. Information and energy flows are the key drivers of relationships that bind and constitute the system. Complex systems are non-linear and can be susceptible to small changes, but may also be capable of reverting back to a stable situation if perturbed. Complex adaptive systems are dynamic, open to their external surroundings, non linear systems that are able to change, adjusting to novel environments. Thus complex adaptive systems are able to evolve while still retaining a large measure of stability. The nature of the information flows, the strength of the linkages and the degree of redundancy of individual agents or agglomerations (nodes) all play a role in the level of stability, responsiveness to change and hence longevity of the system.

Cities can be defined as complex adaptive systems, many of which have demonstrated great resilience over time, surviving wars, social unrest, economic crises and natural disasters. What are the attributes that have made such cities resilient while others have been unable to recover from a catastrophe or have faded into oblivion?

This paper begins to explore the concept of urban resilience from a complex adaptive systems perspective. It considers the elements that constitute the system, their relationships, and the

nature of the flows into, within and from the system, as well as the patterns or agglomerations that describe it. It also examines the role of key agents or nodes within the system, which enable recovery, the importance of external and endogenous responses and how as well as the dynamics of reactions to crises.

**Key words: complex adaptive systems, resilience, change, stability, flows**