

Urban Systems Futures and Green Growth
A Theory of Cities?

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A Theory of Cities?

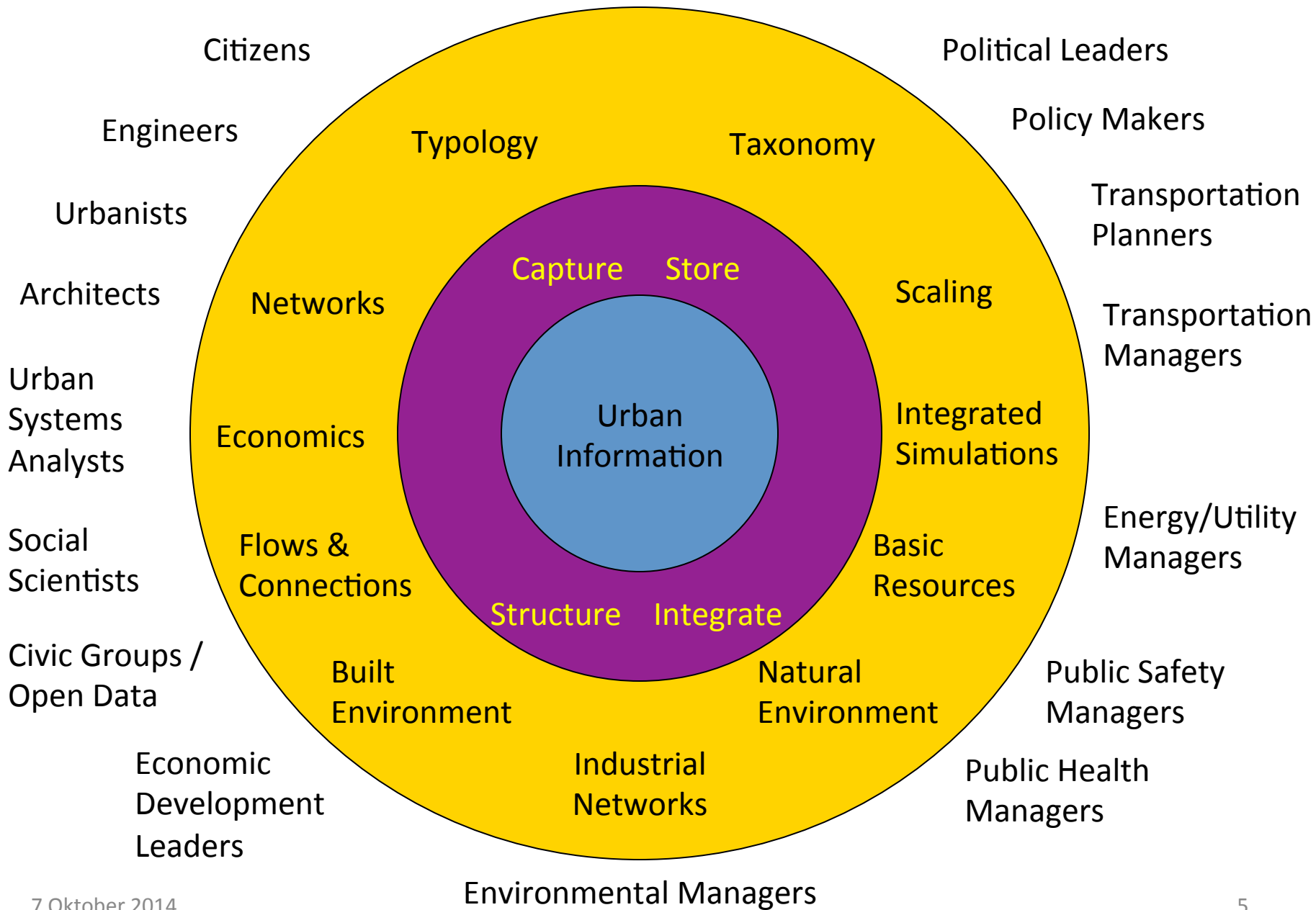
- Important questions
- Looking for answers
- Lots of information about cities
- A theory of cities?
- My conclusions

Important Questions

- What would be a stable operating point for the planet in 2050?
 - Stable population and demographics
 - Sustainable resource consumption
 - Sustainable exploitation of natural environment
 - Built environments for sustainable urban life
 - Sustainable urban life styles
- What are the innovation gaps to achieving these?
- How do we get from here to there without irreversible damage to the planet and to our civilisation?

Looking for Answers

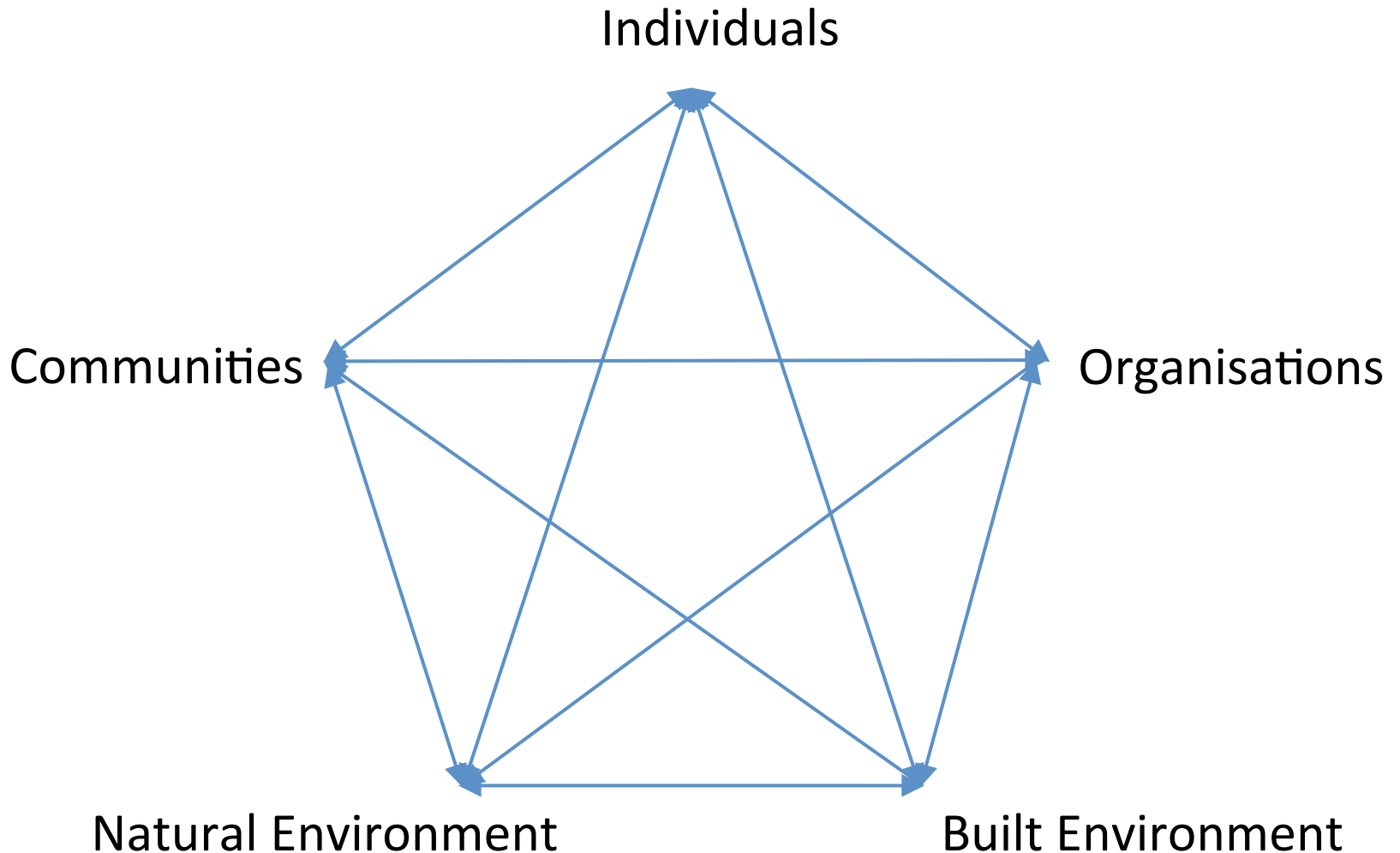
- Answers probably lie in understanding cities
- What is a city?
- How do cities “work”?
- How do cities interact globally?
- How to address all possible cities?
- What would a scientific theory of cities look like?



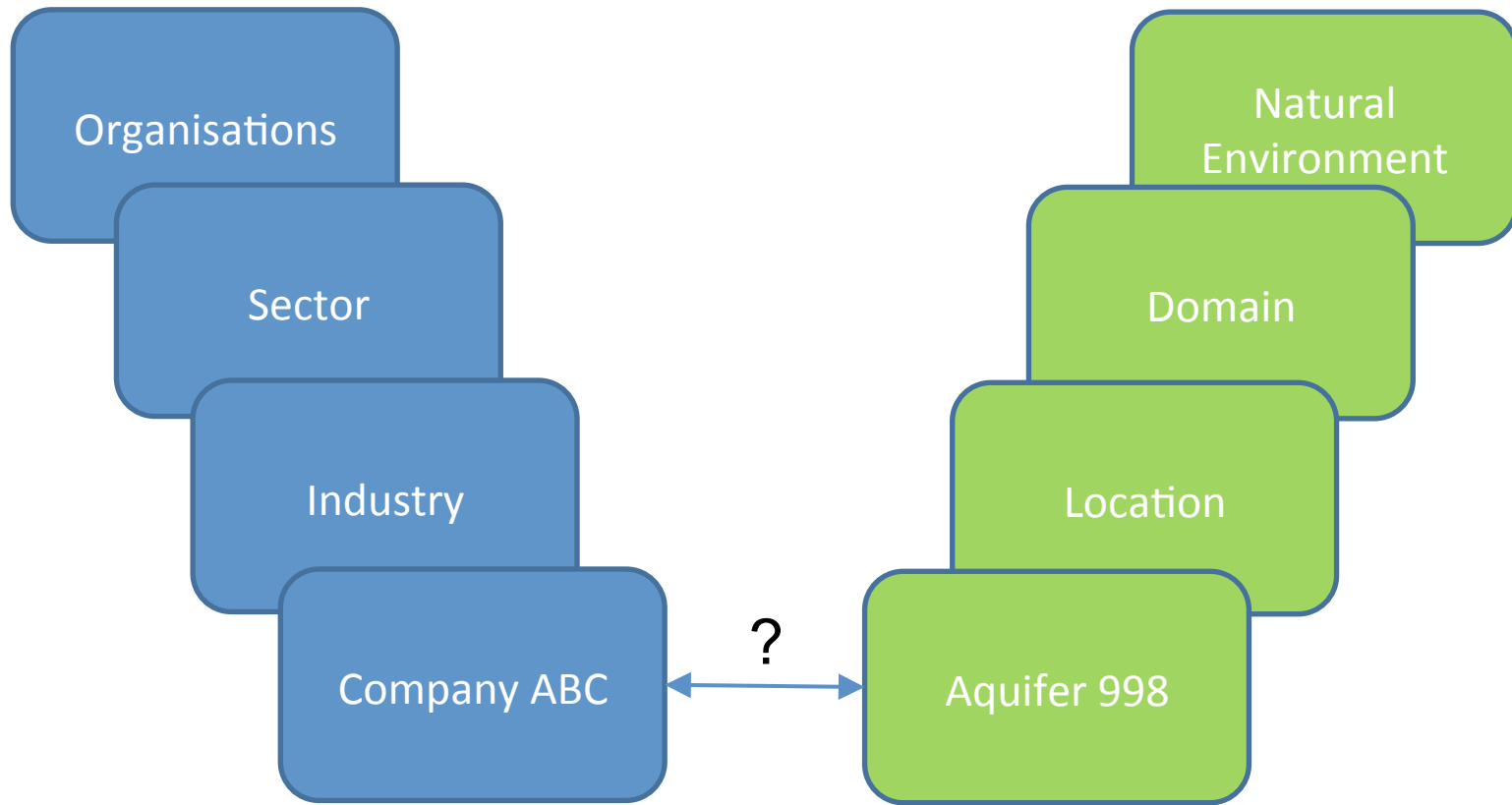
A Theory of Cities?

- City defined by the spatial extent of its interactions
 - Including global interaction among cities
- Abstract view of interactions or state transitions among five top-level domains: individuals, organisations, and the natural and built environments
 - Sub-class down to discrete, interacting entities
- Discrete interactions – state changes – between entities governed by bi-lateral decisions within and among the domains based on each domain's theories
- Apply the scientific knowledge of each domain to estimate probabilities of billions of daily interactions

Abstract Urban Domains



State Transitions between Entities



Will company ABC decide to take water?

Can aquifer 998 afford to supply water?

Economic Theory

Environmental Theory

My Conclusions

- We need both theory and data
 - Abstraction is important
 - Don't abandon understanding to the machines
 - Theory is hard for top-level domains
- Most existing domains do not have sufficiently well developed scientific theories
 - Economics
 - Urban Planning
 - Environmental Science
- A Theory of Cities may be some decades away