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**AN INFRASTRUCTURE OF INTERACTION**  
**Complexity theory and the space of movement**  
**in the urban street**

A thesis presented in partial fulfillment of the requirements of the degree of  
Master in Design  
at Massey University, Wellington, New Zealand

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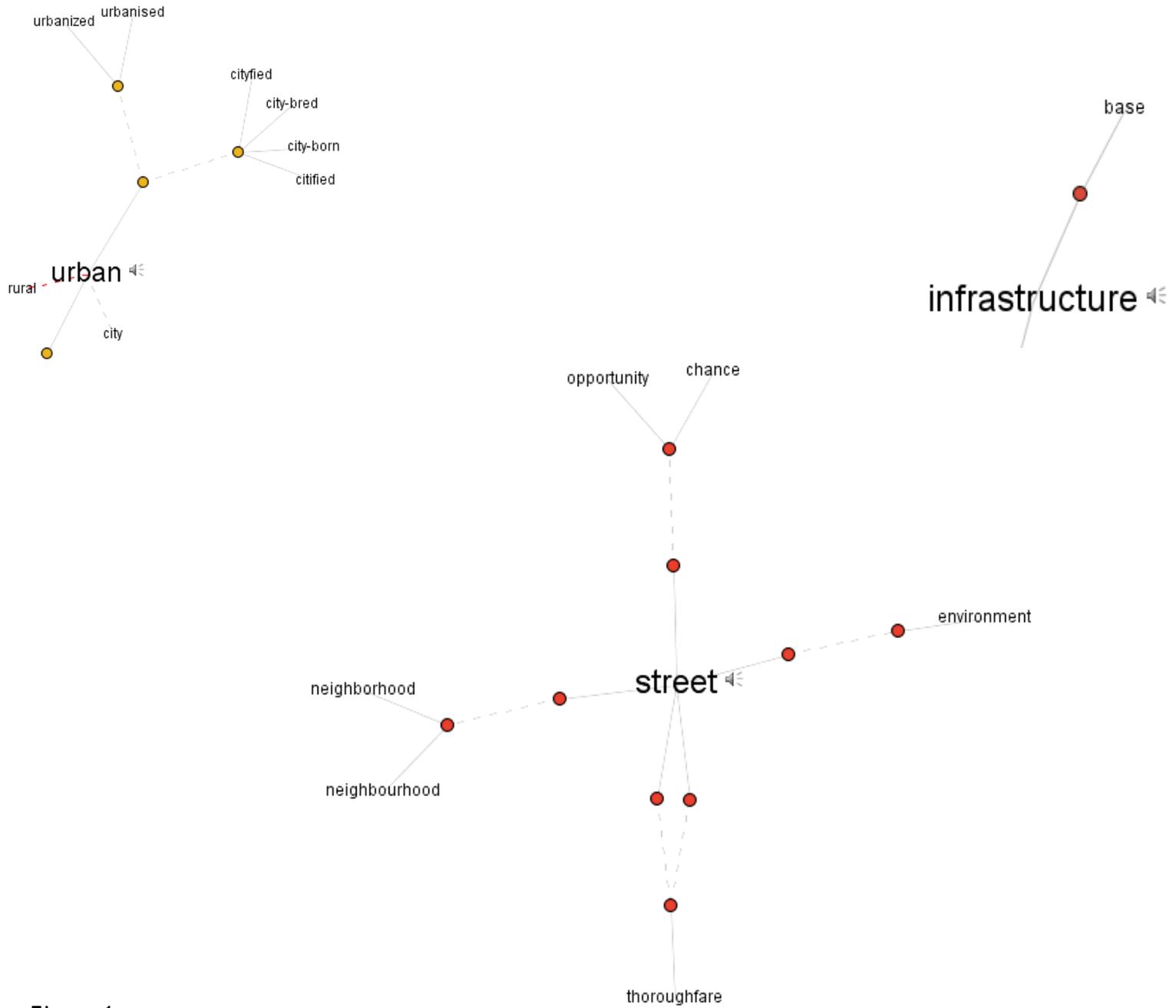
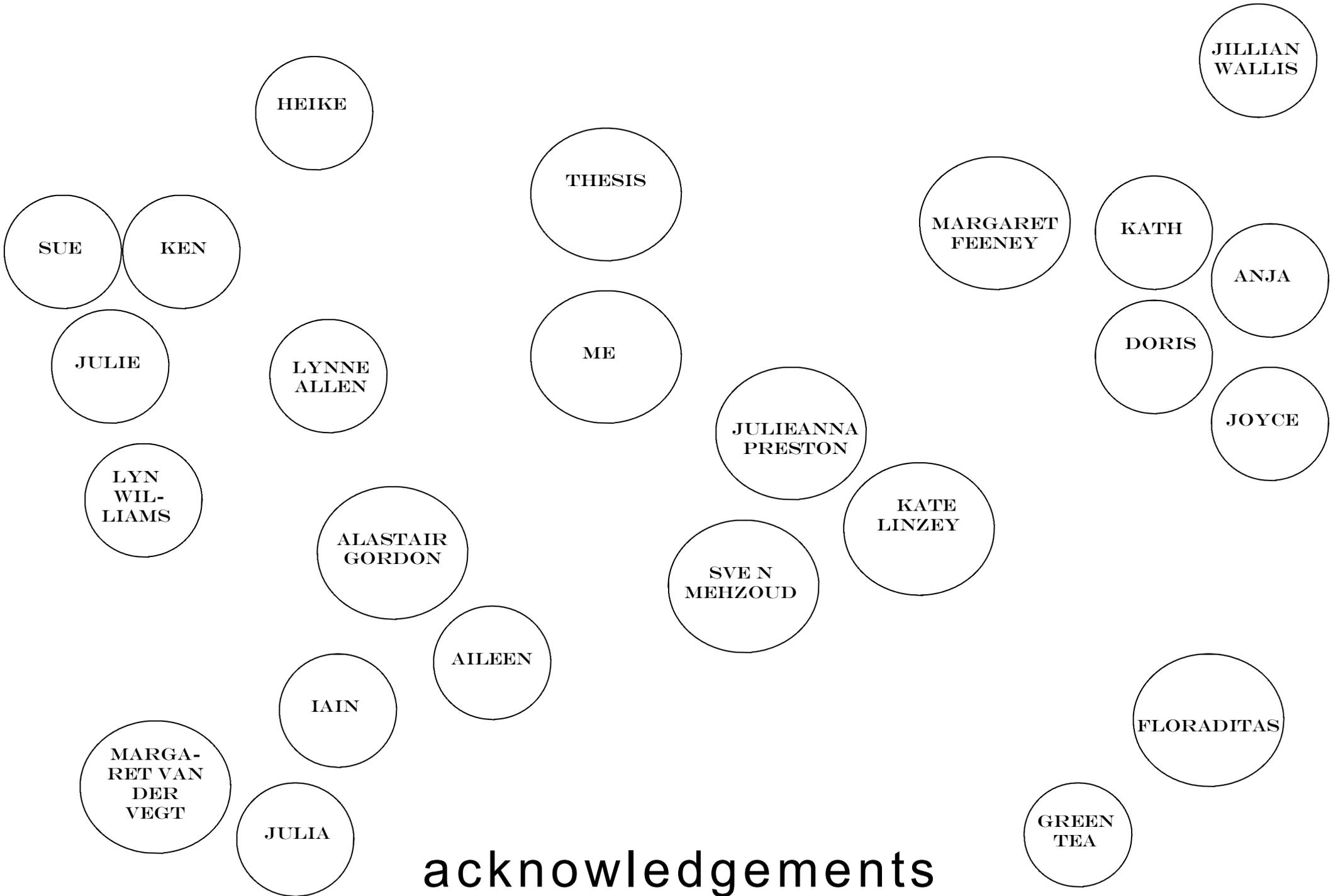


Figure 1





# acknowledgements



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# ABSTRACT

This study uses complexity theory to examine the space of the street. In a morpho-ecological city, process creates form just as form creates process. The process of movement is a critical form generator within the urban system.

In this thesis, the urban system comprising streets/car/pedestrian is examined. If this collection of urban modes of mobility is a complex system capable of self-organising behaviour, what effect does the ordering imposed by traffic engineering have on this system?

I look at the driving body and the walking body as co-creating the city by their movement through urban space. I suggest that, through attention to the fragments of interactions enacted during these movements, we can, through design, allow for the emergence of self-organising behaviour.

Urban shared streets, descendants of the 'woonerf', appear to function more efficiently than engineered streets, without the usual traffic ordering. The counter-intuitive success of these streets implies a self-organising behaviour that is generated by the density of interaction between the inhabitants of the street. These designs potentially work as a change agent, a catalyst, operating within a complex system. This has the potential to move

systems from one attractor state to another.

A city built with these spaces becomes a city of enfilades; an open system of spaces that are adaptable to uses that fluctuate with time and avoid thickening the palimpsest of traffic engineering.

I look at siting shared streets in Wellington, based on jaywalking, a transgressive use of the streetspace that prefigures a shared space, and changes to urban networks associated with such designs.

Interaction within the city is a creative force with a structure. City design needs to consider and address this infrastructure and design for it.

The infrastructure of interaction has been subsumed by the infrastructure of movement. Shared streets indicate there may not be a need for this – they can be integrated.

The process of movement creates instances of interaction; therefore designing spaces of/for movement must be designed to enhance the infrastructure of interaction.

The result of such interaction is not just somewhat better; it may be a phase change - catalytically better .



...all I need is a brief glimpse, an opening in the middle of an incongruous landscape, a glint of lights on the fog, the dialogue of two passersby meeting in the crowd, and I think that, setting out from there, I will put together, piece by piece, the perfect city, made of fragments mixed with the rest, of instants separated by intervals, of signals one sends out, not knowing who receives them.

Italo Calvino, *Invisible Cities*, 1974: 126





Figure 3



## The complex

Complex systems are characterized by

a large number of elements

many interactions between the elements

attributes of the elements are not predetermined

interactions between elements is loosely organized

they are probabilistic in their behaviour

the system evolves over time

subsystems are purposeful and generate their own goals

the system is subject to behavioural influences

the system is largely open to the environment

(Skyttner, 2005:105–106)