

## **Transport infrastructure and Equilibrium development of a conurbation**

### **Motivation & Background**

How cities evolve is the result of complex interactions between many agents such as households, developers, firms and transport agencies. Describing the behaviour of all these agents simultaneously is not a simple task and is made even more complex due to the different speeds of adjustments characterizing the different urban changes. Construction of new transport infrastructure is typically a very slow process, buildings also have a long life-span. Population and employment, on the other hand, can change fast; firms are established or closed down, households formed or dissolved and can move easily. A few papers deal explicitly with this problem, but these only consider the housing market (interaction between developers and households). Anas and Arnott (1991&1993), Martinez & Hurtubia (2006), Glaeser (2008). In these papers decisions on public transport infrastructure (metro, motorways, airports) are usually ignored or exogeneous. A few papers (Brueckner & Selod, 2006) model the effect of new transport infrastructures.

### **Research outline**

Our proposal is to explore the public decision making on transport infrastructure in a conurbation that is subject to exogenous employment shocks. We use a simple economy with two or three interconnected geographical zones. Individuals can live and work in one of the zones or can commute between them. This model is used to explore the dynamics of housing and work decisions after a permanent shock in labour demand occurred in one of the zones.

Employment is exogenous and is represented by a competitive demand for labour. Competitive developers decide on construction of new dwellings. Households choose where to live and rent a dwelling. The public authorities can either be centralised (one regional authority for the three zones) or decentralised. The public authority makes decisions on transport infrastructure investment and pricing. Investment and operation is financed by user charges and a tax per dwelling. Public decisions are taken by majority vote.

The model is used to illustrate the role of expectation of developpers and government agencies and the role of transport decisions for the equilibrium. The model can also be used to study the effects of additional government instruments (planning tools on housing) on the equilibrium.