Introduction
This research studies the involvement of the Dutch housing association in urban renewal from the perspective of actor-network theory (ANT; Latour, 2005). It introduces and tests ANT concepts and methodologies to analyze the organization of the housing renewal in the Sint-Mariastraat in Rotterdam (NL) by Woonstad Rotterdam. The two leading questions are:
- what material actors are in the housing renewal network of the Sint-Mariastraat?
- how do these material actors negotiate the housing renewal network?

Background
The complexity of urban renewal has increased as it involves various actors, multiple dimensions and specific areas. We define urban renewal as:
The assignment of citizens, societal actors and the government to maintain and improve the quality of the living environment. (Donner, 2011).
Dutch housing associations are important in this assignment since they have a large housing stock, serve the lower end of the housing market, operate in problem neighbourhoods and aim to provide quality housing. Against the background of strict (financial) control, a depressed housing market, a deprecating stock and issues of societal trust, housing renewal is a necessary yet strenuous task.

In the current debate on the future of the housing association, new missions and typologies have been proposed (Gruis and Nieboer, 2014). The emphasis is on the current stock, new services and partnerships. Specifically, the housing association is considered a network organization (Gruis, 2010). This affirms the identity of the housing association as a social enterprise positioned between state, market and society (Czischke, 2009).

Literature
The operations of the Dutch housing association—and housing renewal in particular—increasingly take place in networks. The coordination of actors and their goals, views and resources is a challenge (Haffner and Elsinga, 2008). Housing studies have analyzed the relations in renewal networks (Bortel et al., 2009). Invoking network governance (Koppenjan and Klijn, 2010), this literature presents how renewal studies have a normative view on the steering of uncertainty as a stabilization of the housing housing renewal network (question 2).

Framework
We employ ANT primarily as a methodology to provide for an analytical framework based on the idea not to separate the natural from the social. Consequently we detect new entities: non-human actors. They are the natural and material objects that humans engage and mobilize for specific (human) ends. To make visible the work these non-humans we use the concept of translation (Callon, 1986) and the technique controversy mapping (Yaneva, 2011). We analyze four moments of translation: problematization (to relate and define actors in the network), intercession (to show the actors the network is in their interest), enrolment (to register actors in the network) and mobilization (to make actors mobile and controllable). In this way we can approach the associations being made between human and non-human actors in heterogeneous networks (question 1), and the development of uncertainty as a stabilization of the housing housing renewal network (question 2).

Case study
We look at the process of housing renewal in the period from 2008 to 2013 to study its evolution into a defined and stable project. We identify four elements or uncertainties in the controversy: (1) the development of the neighbourhood, (2) the future of the tenants after renewal, (3) the condition of the housing and the foundation risks and (4) the financial position of Woonstad Rotterdam. In turn we find four main entities: (1) the focal actor Woonstad Rotterdam, (2) the tenants of the Sint-Mariastraat, (3) the houses Sint-Mariastraat 106-146 and (4) the future residents.

Discussion
After the 2008 Neighbourhood vision and strategy, for Woonstad the primary uncertainty is immediate and technical; that is the severity of decaying foundations. It uses devices such as dream sessions, inspections and scenarios to organize the renewal network by means of creating spokespersons for the actors. In 2010 Woonstad concludes that tenants need to move out and rental contracts are stopped. Yet the study illustrates that actors are in competition and spokespersons are unreliable. These negotiations imply that new spokespersons need to be created and this opens up possibilities to redefine the plan.

Conclusions
Non-human actors matter but their power and agency is constituted in networks. Foundations were a key actor. Once their technical uncertainty was settled, Woonstad soon started the project and enrolled the actors in the housing renewal network. This network dealt with emerging issues that were not just technical but also political and financial. Still, non-human actors can be used as network resources by all actors. Foundations offered tenants an opportunity for real participation to redefine the plan. ANT can shed new light on what democracy can stand for in situations of shared uncertainty. It blurs the boundaries between the technical and the social, and introduces new ways of being political. We therefore claim that participation should be more about contesting the parts than on consenting the whole.

Recommendations
The research points to the analytical power of ANT to research housing renewal networks, in particular on the following issues:
- to revisit the democratic anchorage of network governance and its strategies to reach consensus
- to study by which mechanisms uncertainty is defined and renewal is made technical or political
- to examine the various ways of being political in participatory housing renewal processes

The implications are:

-uncertainty should be managed to build durable social and material relationships
-uncertainty should not just be managed in networks but also be defined in networks
-issues and stakeholders should not be pre-defined by the project manager

Works cited
Donner, J.P.H., 2011. Brief over Wijkenaanpak en Vogelaarhe (NL) by Woonstad Rotterdam. The two leading issues and stakeholders should not be pre-defined by the project manager.