

# ANALYSING ACTOR BASED REACTIONS TO REAL ESTATE FEATURES IN FAST-GROWING URBAN AREAS

**Brano Glumac<sup>1</sup>, Ad den Otter<sup>2</sup>, Jos Smeets<sup>3</sup>, Wim Schaefer**

<sup>1,2,3</sup> University of Technology Eindhoven, Eindhoven, the Netherlands

[b.glumac@tue.nl](mailto:b.glumac@tue.nl)

## **Abstract**

This paper provides new insights for analyzing relations between actors and factors within urban development areas. Additionally, it contributes to basic characteristics and importance of classified actors in an urban development process. A study was defined, as part of a PhD research project to identify actors based reactions for decision making concerning real estate features in an urban development area. It is based on the analysis and comparison of possible methodologies and techniques to investigate such actor's involvement in urban development processes. As a result a technique selection choice is presented for analyzing such actors based reactions. Better understanding of their characteristics concerning actions and links between actors will clarify their goals and interests. This paper provides a) an initial input for modeling urban development process such as: multi-actor environment, factors influencing decisions of actors and b) bring better insights in a development process which engages previous components. Further on, used and promising methodologies will be discussed considering modeling a specific actor behavior with relevant factors.

## **1. Introduction**

In this research the vision on urban development processes involving multi-actor environment and real estate features can be traced from the thoughts of Christopher Alexander in the nineteen hundred seventies (Alexander 1975; Alexander 1977; Alexander 1979) to nowadays compact urban development and neotraditional neighborhood design elaborated in the literature on smart growth (Barnett et al. 2007). Crucial in Alexander's idea is that it doesn't address the structure of a neighborhood or area itself but instead emphasizes a generative process of urban development. In this concept the local inhabitants and users of a town "repair" the areas that don't work, in order to form a cohesive whole town. Rather than work toward a pre-designed and idealized goal, the development process allows a town to unfold organically, trusting that the process of repair will create logic and order. The direct contribution of final users to city development is regarded as very futuristic in this research. Instead, the user's voice is perceived nowadays in western societies as the market choice (Kotler 2006). Alexander's idea might be interpreted as planning in a consecutive decision round mode. Initial strategic decision by multi-actor follows realization of certain real estate features in the area. A real estate feature might involve a new or the same group of actors that will try to improve the existing condition and create added value by new strategic decisions for urban development. This process is visualized by Figure 1. It is a continuing process providing new opportunities and upgrade of urban values. This model

(Figure 1) is a proposal how the urban development process could be monitored, analyzed and hopefully explained.

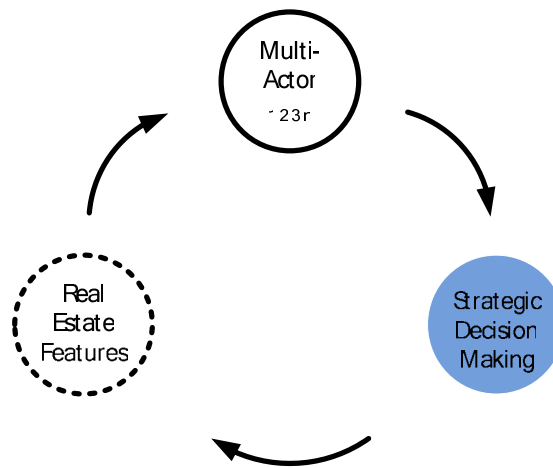


Figure 1: Urban development process cycle

Keeping in mind that the potential benefits of urbanization far outweigh the disadvantages it is clear that the challenge is in learning how to exploit its possibilities (UN Habitat 2003). Following this statement, each city as a complex system will be a lasting occupation for researchers. In order to contribute to this goal, and because a general theoretical model that includes both physical and social complexities and their influences in an economic system is lacking (Batty 2008; Bettencourt et al. 2007), this research project focuses on the strategic behavior of the most relevant actor in the multi-actor environment concerning decision making and creating opportunities. We therefore selected the real estate developer.

Understanding a city and its growth has been studied for over a century. However, the knowledge to understand this phenomenon fully is far from reach also due to its dynamic and changing character in time. An urban environment today might be described as a complex and dynamic system in terms of both physical and socio-economical aspects. Physically cities are regarded as complex systems that mainly grow bottom-up, their size and shape following well-defined scaling laws that result from intense competition for space (Batty 2008). Beside the physical impact and its uncertainty of city growth, there is strong evidence that social organization and dynamics relating urbanization to economic development and knowledge creation (Bettencourt et al. 2007). These two aspects of city's complexity influence each other directly. The possibility of making a compact model and theoretical framework that captures all influences remains illusive because of significant obstacles toward this goal are the immense diversity of human activity and organization and an enormous range of geographic factors (Bettencourt et al. 2007).

These thoughts need to be simplified for the purpose of conducting research. Here, the manageable physical representation of urbanity is represented by the concept of Real Estate Feature (REF). REFS represent valuable urban planning content or factors in an urban area, which are interpolated and have different values in cities complex systems due to their situation and infrastructural aspects. Another important element of urban complexity, societal dynamics, is viewed from the position of various actors with their

goals, tasks, visions, and partnerships. As noted previously, there is an obvious, logic or intuitive relationship between actors and factors. This goal defines an important initial research question: How do actors respond to REF? Further more, it is assumed that answers to this question easily lead to a better understanding of urban development processes.

## 2. Multi- actor environment

There is a decreasing manageability of an urban environment leading to change the importance of involved actors. Nowadays, the orientation of actors focuses to opportunities instead of managing the process and controlling the system, specifically to combinations of sub-solutions (Heurkens 2008; Loon and Wilms 2006). This refers to the idea of shifting from urban central planning toward polycentric decision arenas involving multi-actors.

For the purpose of communication, the next definition of an actor will be used as a starting point in this research: “An actor is an individual or an aggregated social entity (collective actor) that has the ability to make autonomous decisions and act as a unit – e.g., a company or an association is a collective actor with overall accepted rules for collective choice and can thus be regarded as a single social entity” (Pahl-Wostl 2005). Actors in the urban environment at this research are regarded as stakeholder groups such as: investors, developers, users and governmental agencies (see Figure 2). Stakeholders are defined corresponding to the definition of Freeman (1984): “any group or individual involved in urban development, directly or indirectly, that can affect or is affected by the achievement of the organization’s objectives”.

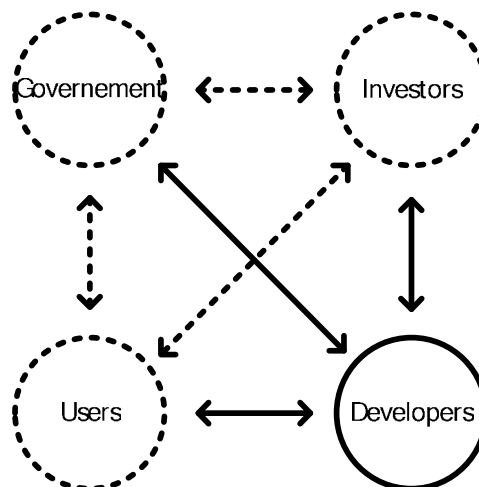


Figure 2: Actors involved in urban environment

Each of the actors has its own characteristics (see Table 1) and logically perceives information of an urban environment in a different way which easily leads to different actions. In addition, to be able to deal with complexity amongst various actors and REFS, this study focuses on actor’s individual strategic behavior. The choice has been favored a developer by making the assumption that it is the most influential one of all

actors in market-oriented society and deals with urban land at the same time (Andersson 2005). Although one actor is at the front, the presence of the others is inevitable for modeling decisions and behavior of a developer. These other characteristics will be translated in supply/demand (Kotler 2006) relations towards the position of the developer. At the same time those relations will act like impulses from a city that makes connections between urban neighborhood (geographical scale of the research) and the surrounding area of a city. This could be achieved by elaborating characteristics in a socio-economical context of a “user”, using demographics and the data from the whole city and not just from the same neighborhood. This simplified observation of actor’s interconnection will be evaluated and elaborated with invited experts involved in recent urban development projects.

Stakeholder group	Scale of action					Aggregation			Organization			Public Private			Tier	
	• local	• city	• region	• national	• world wide	• individual	• aggregated	• highly aggregated	• not organized	• informal institutions	• formal institutions	• public	• private non-profit	• private profit	• strategic	• operational
<ul style="list-style-type: none"> <li><b>Government</b></li> </ul>																
Relevant ministries				X			X			X		X	X		X	
Local authorities	X	X					X			X		X	X		X	X
<ul style="list-style-type: none"> <li><b>Investors</b></li> </ul>																
Bank			X	X	X			X		X		X	X			X
Venture capitalist				X	X	X							X			X
Pension Fund				X	X			X					X			X
<ul style="list-style-type: none"> <li><b>Developers</b></li> </ul>																
Small size company	X	X				X				X			X		X	X
Medium size company			X	X			X			X			X		X	X
Large size company				X	X			X		X		X	X	X	X	X
<ul style="list-style-type: none"> <li><b>Users</b></li> </ul>																
Group of households			X					X		X						
Citizen	X					X			X							

Table 1: Characterization of stakeholder groups, adopted and modified from (Bakker at al. 1999), and (Pahl-Wostl 2005)

There are various stakeholder identification techniques (Bryson 2004). The most valuable techniques for our research were found in the category of organizing participation. These techniques are already in use as urban decision tools (Bryson 2004;

UN Habitat 2001) and address the finding problem of stakeholders in a general view. The technique Power versus interest grids is described in detail by Eden and Ackermann (1998:121 – 5, 344 – 6). These grids array stakeholders on a two-by-two matrix where the dimensions are: the stakeholder's interest (in a political sense as opposed to simple inquisitiveness), see Campbell and Marshall (2002), in the organization or issue at hand, and the stakeholder's power to affect the organization's future. Four categories of stakeholders as defined by Howe (1992) were recognized: players that have an interest and significant power; subjects that have an interest but little power; context setters that have power but little direct interest; and the crowd that consists of stakeholders with little interest or power (see Figure 3).

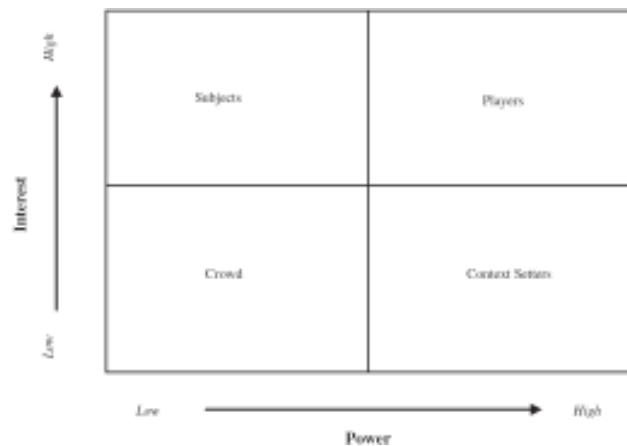


Figure 3: Power versus interest grid, Eden and Ackermann (1998: 122).

This tool typically helps to determine which players' interests and power bases must be taken into account in order to address the problem or issue at hand (Bryson et al. 2002). Stakeholders have similar and different interests in an urban redevelopment process. Making a characterization and power/interest observation is the first step to get insight in various types of developer's behavior and for their essential requirements in an urban environment.

Starting point for implementing stakeholder analysis will be recognized types of developers. Based on the genesis and goals, several types of project developers can be distinguished (Hieminga 2006; Coiacetto 2001). Author Coiacetto 2001 made a following typology:

- Passive local property owning developer
- "Means to mission" developers
- Specialized client developers
- Showpiece developers
- Eye on the street builder-developers
- Value adding opportunity developers

The soundness of these types brings more questions than answers. Although, the author argues that it is more appropriate to make a soft structure of developer's type behavior to generate new types influenced by various factors that society is facing. Characteristics

of these developer behavior types could be found in the goals and objectives of developers in a more structured typology (Hieminga 2006):

**Independent project developer** - This group of developers is not associated with other branch-related activities, like the developers that are a part of a construction company. Project development is a goal in itself. Through project development activities, continuity of operational management and high returns on investments are pursued for shareholders.

**Constructor** - Goal of this group of developers is to reach a high building production through project development. This group is also called 'developing constructors'. This group is relatively large because almost all middle-sized and big construction companies have a project development unit. This group is largely represented in the development of owner-occupied houses.

**Asset investors** - This type of project developer keeps the real estate in their own portfolio after development. This group considers real estate development as a means to come to good real estate investments. Some of the big institutional real estate investors also develop real estate themselves – using the fiscally attractive status of an investment company – but this category mainly exists from wealthy particular investors.

**Social housing associations** - They are increasingly active and influential on the commercial real estate development market after the liberation in 1995. Project development is a means for social housing associations to finance uneconomic social investments.

**Financial institutions** - They are also active in project development.

**Architects** - Development activities are a means to perform design services. Considering the complexity of the total building process and the required (big) size of architectural companies to be able to do this, this group of project developers is relatively small.

By better understanding the variety of developers and their behavior it will be possible to conclude that no general definition is suitable. The definition of Peiser and Frej (2003): "A developer can be defined as the person or firm that is actively involved in the development process and takes the risks and receives the rewards of development" could fit just as one of the behavioral types.

### **3. Factors influencing decisions - Real Estate Features (REF)**

Real Estate Features (REF) are defined as urban land and its upgrades. They are visible and easier to manipulate than inherit physical and institutional environment regarded as urban characteristics. Those are influenced by socio-economic surrounding (Figure 4). In other words, REFS are operational representatives of urbanity. With them it is possible to directly influence city growth and activate actors.

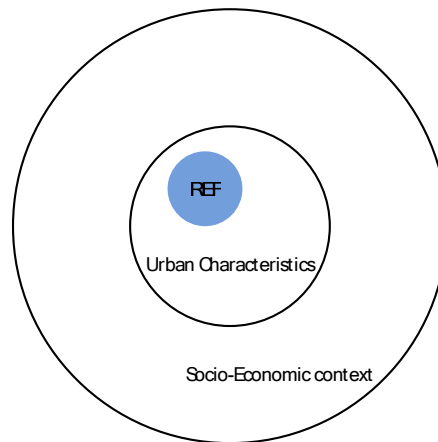


Figure 4: REF in wider context

Typical real estate development, as described in Miles et al. (2007) and Peiser and Frej (2003), assumes the existence of especially two characteristics: a) the institutional factors enabling investment and rewards for undertaking a project; b) the urban infrastructure to which the project is expected to connect the technologies and construction used in development. Institutional factors and infrastructure are both preconditions that, if not present, significantly increase the risk of the project. Both are strongly dependent on governmental policy and mechanisms.

Many sources indicate that problematic institutional factors particularly including those involved in real estate (property rights, exchange and financial mechanisms, taxation, area governance, governmental agencies) represent obstruction to effective urban land development. Project risk in less developed countries based on a disconnection between institutions and governance mechanisms that typically mediate social and economic activity and commitments on the one hand and those that would inhabit and benefit from such projects. For example, as Doh & Ramamurti (2003) point out, infrastructure projects are plagued by many kinds of risk, including the risk of governments' bargaining on their commitments.

Other problem, may involve insufficient physical preconditions for successful urban development. Starting identification of these key factors could be: morphology, spatial organization, infrastructure, land use types.

In this research the emphasis is on how stakeholders respond and precede decision making towards REF of an urban area. A REF can be identified as an independent or dependent variable fitting within larger notion (see Figure 3) of urban characteristics (Table 2). Precondition for this investigation will be the focusing to the content of a REF corresponding to these urban characteristics and how the REF's are related systematically to each other. Starting point is an inventory followed by analysis addressing the most relevant REF of an urban development area.

	soil quality waterfront spatial organization	land use type infrastructure	water supply sewage system energy system public transportation system highway, railroad, airport, port telecom. and virtual network
Esthetical	skyline landscape urban design land mark architectural design neighborhood image		
Ecological	quality of air quality of land quality of sound insolation climate		
Social	social composition ethnical composition tribes		
Institutional	property rights tax regulations financial mechanisms urban governance ministry in field of development		

Table 2: Urban characteristics

Outcomes of the research might be applicable in various cultures depending on their view to the market and economic issues.



#### 4. Strategic decision making in urban development project

The focus in this research project will be on strategic decisions<sup>1</sup> evoked through various actors. Strategy considers decisions of an individual actor that have long lasting effects and can not be easily reversed. Although, the strategy is not perceived as a projection of effect to be accomplished in the next ten to twenty years. The strategy in the context of this research addresses the way an actor perceives information from an urban structure and socio-economical environment followed by its reaction on initiatives or decision making about real estate features (REF). Although, to be able to successfully accomplish a project it is also necessary to have instruments how to do this. In this research it refers to the collaboration and negotiation in a multi-agent environment. The various interdependent relations between actors are investigated and modeled by van Loon for the purpose of facilitating and stimulating stakeholder's collaboration (Loon 2008). Different methods and theories (Leengoed et al. 2007) are used for the same topic. Common for these projects is the focus on collaboration and decision making which are made during that process. This knowledge is beneficial for this study and will serve as guidance.

As stated before, the final focus of the research is to model the behavior of developers where these acts are regarded as respond to the user's voice in a free market concerning urban environment (Andersson 2005; Malpezzi et al. 2004; McCann and Shefer 2004). Developer's behavior has several levels of which two levels already have been stated. On strategic level analysis this starts from insights into these questions (WWW): **Why** - for which purpose some projects are built, what is the interest laying behind it connected to various developer's behavior types?; **Where** - where should be built or on which location?; **What** - what should be build among land use types, right mixture of types, on which scale in the context of supply/demand relations (Kotler 2006)),?; and **When** - when does the development process of a project match real estate market?

These questions address developer's perception of opportunities in a city concerning REF (Figure 5). Such an opportunity can be described as a potential for producing higher urban value instead of merely cost-benefit analysis.

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<sup>1</sup> strategy n. 1. The art or science of generalship or military planning, or a specific longterm plan in a military conflict, business, politics, or social affairs, often distinguished from tactics, the detailed manoeuvres carried out to achieve immediate or short-term objectives. [From Greek strategía generalship, from strategos a general, from stratos an army + agein to lead]

"strategy n." A Dictionary of Psychology. Andrew M. Colman. Oxford University Press, 2006. Oxford Reference Online. Oxford University Press.

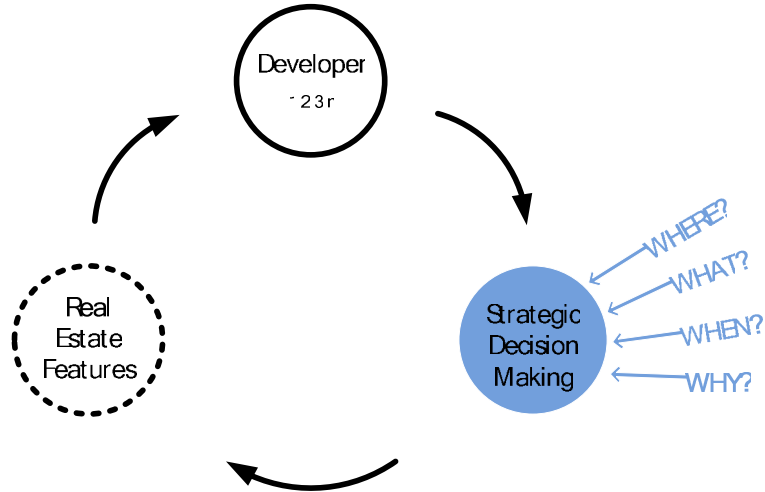


Figure 5: Developer’s decisions and urban development process

Beside the explained vision of urban development life cycle considerable significance for this research has different notion of a process. It is a process of the development project itself and represents a tactical or operational level. Various authors explain it by defining various parallel PHASES (Hieminga 2006; Miles et al. 2007; and Peiser and Frej (2003)) such as: predevelopment, construction, development, leasing, operations, and finalize with the acts of sale. Various periods initiate different questions and different REF as written before.

**5. Methodological issue**

Previous chapters introduced already three components which describe developer’s behavior for the purpose of this research. They are all correlated (see Figure 6) and certain decisions (go / no go) could be presented as a dot in a three dimensional system with certain value for all three components (WWW, REF, PHASES) representing an urban development process. By connecting the specified dots through a curved line the urban development process is visualized.

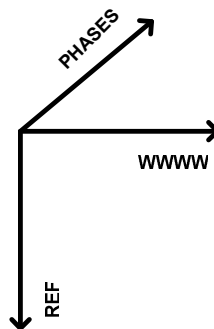


Figure 6: Three components of developer’s behavior

Guiding this research, based on assumption of developer's importance in the total urban development process has numerous social benefits as written before. On the other hand, making conclusions based on statistical data make this research hard to conduct. Sparse data environment for sure follows this topic. This fact will strongly influence the choice of methodologies which are going to be used. Most probably they will be based or be compatible with the heuristic approach. On the other hand there is an ambition to use sophisticated mathematical tools which are becoming main stream in all social sciences. The methodology needs to be consistent but still our thinking is that it is possible to use a combination of qualitative and quantitative methods.

### **a. QFD**

The four main questions concerns a developer, why, where, what, and when the opportunity occurs. Insights in these questions should provide a base for modeling its behavior or an answer on the initial research question: How does actor respond to REF? There are indications that the QFD methodology could be use for the purpose in terms of a developer's tool to investigate the situation for a potential opportunity (Chuang 2001; Schaefer et al. 2001). QFD in this sense will offer a decent overview of certain projects at certain points in time of the decision making process, checklists and most important, it can be used as a thinking board for the next decisions. This method will provide useful insights in relations of developer's requirements (WWWW questions) and urban characteristics.

The next explanation from various authors includes the author (at the first place) of this method "QFD has been used to translate customer needs into engineering design characteristics through the integration of marketing, design, engineering, manufacturing, and other relevant functions of an organization" (Akao, 1990; Cohen, 1995, Xie 2003). It is important to mention that this method is useful in both product design and process design (Xie 2003).

The best known and used QFD method is the House of Quality (HOQ). Originally, HOQ focuses to the correlation between the identified customer requirements, called the WHATs, and the engineering characteristics, called HOWs. Making a HOQ (Figure 7) can be explained in seven steps. (Xie 2003):

1. List customer requirements (WHATs) - here it is important to mentioned that this question should represent developer's requirements from each of four main questions (WWWW)
2. List engineering characteristics (HOWs) – this part of HOQ will systematically present urban characteristics (Table 2)
3. Develop a Relationship matrix between the WHATs and the HOWs
4. Develop an interrelationship matrix between pairs of HOWs
5. Competitive assessments
6. Develop the prioritized customer requirements
7. Develop the prioritized engineering characteristics

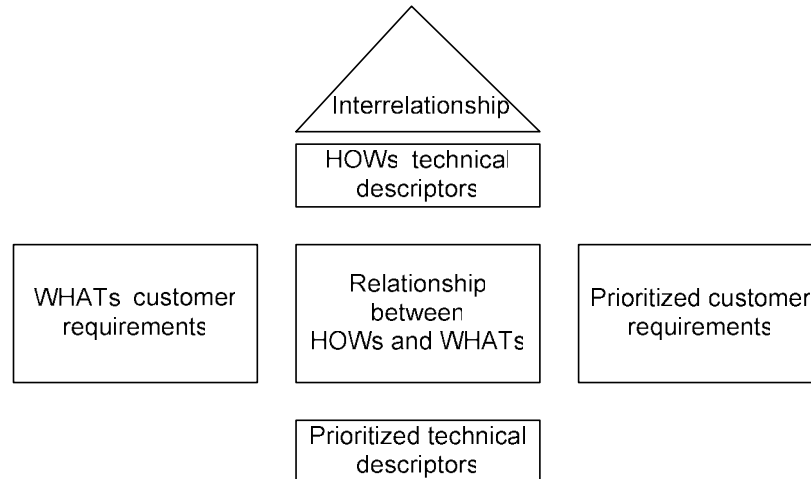


Figure 7. HOQ Concept Model (Xie 2003)

As explained in the introduction there are four crucial questions that most likely drive the developers thinking: these are where, what, when, and why it is seen as an opportunity. Each of these questions has its own patchwork hidden behind the question and can be modeled, put in the HOQ framework. This separation is important because the priority of each thinking phase is different from project to project and also varies from the type of developer. In addition, separation will reduce a risk of offering overall conclusion by using a single framework. Nevertheless, three crucial questions stays connected and appropriate method is necessary in order to separate them. Shin et al. (1998) developed a complexity reduction approach using correspondence analysis. It decomposes an HOQ into several matrices that are smaller in size and, thus, makes it easier to perform QFD in practice. One of the possible extensions of this framework is its compatibility with AHP theory (Chuang 2001; Xie 2003). In that way it might be possible to explain or to model the presented connection in a quantitative manner.

### ***b. Multi-agent analysis***

An increasingly used approach in various simulation models for urban environment is a multi-agent analysis. Still much information about modeling behavior of developer is insufficient. There are rare examples of this (Holman et al. 2008). What distinct these models is the fact that they allow researchers to examine how the interactions and motivations of individual agent produce global patterns of behavior.

### ***c. Others***

There are indications that it is possible to use varying theories for this topic but still they are not found in our area of research. These are: Bayesian Belief Network (BBN), Neural Networks, already mentioned Analytical Hierarchy Process (AHP), Game Theory and others to be discussed.

## **6. Conclusion**

The question we raised in the introduction: “how do actors respond to REF” and understanding their decision making cannot be answered yet because no surveys or case studies are executed and no outcomes were generated that support our thinking and assumptions. However, we explained in this paper the various methods and techniques that can be used, and we attempted to model actors behavior in terms of their response to REF that are triggering. The usefulness should now be tested in practice to get feedback for this approach.

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