



TRANSIT ORIENTED DEVELOPMENT AS TRAGEDY OF THE COMMONS

How institutional theories on Common-pool resources help explore the role of inter-municipal competition in the implementation of Transit Oriented Development

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PREFACE

This graduation thesis was written for my Master Socio-Spatial Planning at the University of Groningen. Much of the research was conducted during an internship of six months at the consultancy and engineering company Witteveen+Bos. With this thesis I found the opportunity to further explore my interest in the interaction between urban form and mobility. In Transit Oriented Development, the subject of study, transportation and spatial planning are united. It is my hope that the insights on the institutional design of Transit Oriented Development contribute to the theory and practice of sustainable spatial planning.

I look back on an inspiring and intensive period. Without the help and support of friends, family, colleagues and fellow students this thesis would not have been possible. Therefore I want to thank all those people that contributed in various ways. In particular I would like to express my gratitude to Maurits Schilt, my supervisor at Witteveen+Bos, for his suggestions, encouragements and pragmatic view on the thesis process. I also would like to thank Wendy Tan, my supervisor from the University of Groningen, for sharing her expertise on Transit Oriented Development, her constructive and critical feedback and guidance in the process of doing academic research.

Finally I would like to thank my parents and my girlfriend for their constant support during the period that I studied in Groningen.

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ABSTRACT

The challenge of implementing Transit Oriented Development (TOD) is a subject of discussion in the field of planning. Among the various institutional barriers that are recognized, the role of inter-municipal competition is largely unspecified. Since the literature on TOD lacks further clues institutional theories on Common-pool resources (CPR) are used to explore how inter-municipal competition affects the implementation of TOD. These theories explicitly account for competition in collective-action problems that seem equivalent to that of TOD implementation. Based on this multidisciplinary approach, TOD is conceptualised as a CPR. This CPR-framework is applied to three distinct cases of regionally coordinated TOD to test for empirical validity. The findings indicate how municipalities in face of geographical competition may make the rational, self-interested decision not to commit to the coordination of land use that would bring about the collective benefits of TOD. This strategic behaviour of municipalities is triggered by the high individual costs of losing (or missing out on) a share of households and businesses that could follow from restrictive local land use policies, combined with the fear for free-riders: other municipalities that share in the collective benefits of TOD, but do not restrict their land uses. In absence of institutional arrangements that adequately ensure municipal compliance with coordination, inter-municipal competition may impede the implementation of TOD. The 8 institutional Design Principles that are used in the CPR-framework to assess these institutional arrangements can provide important clues for improving the institutional design of coordination and thereby contribute to the implementation of TOD.

Keywords: transit oriented development, implementation challenges, inter-municipal competition, coordination, common-pool resource, design principles, institutional arrangements

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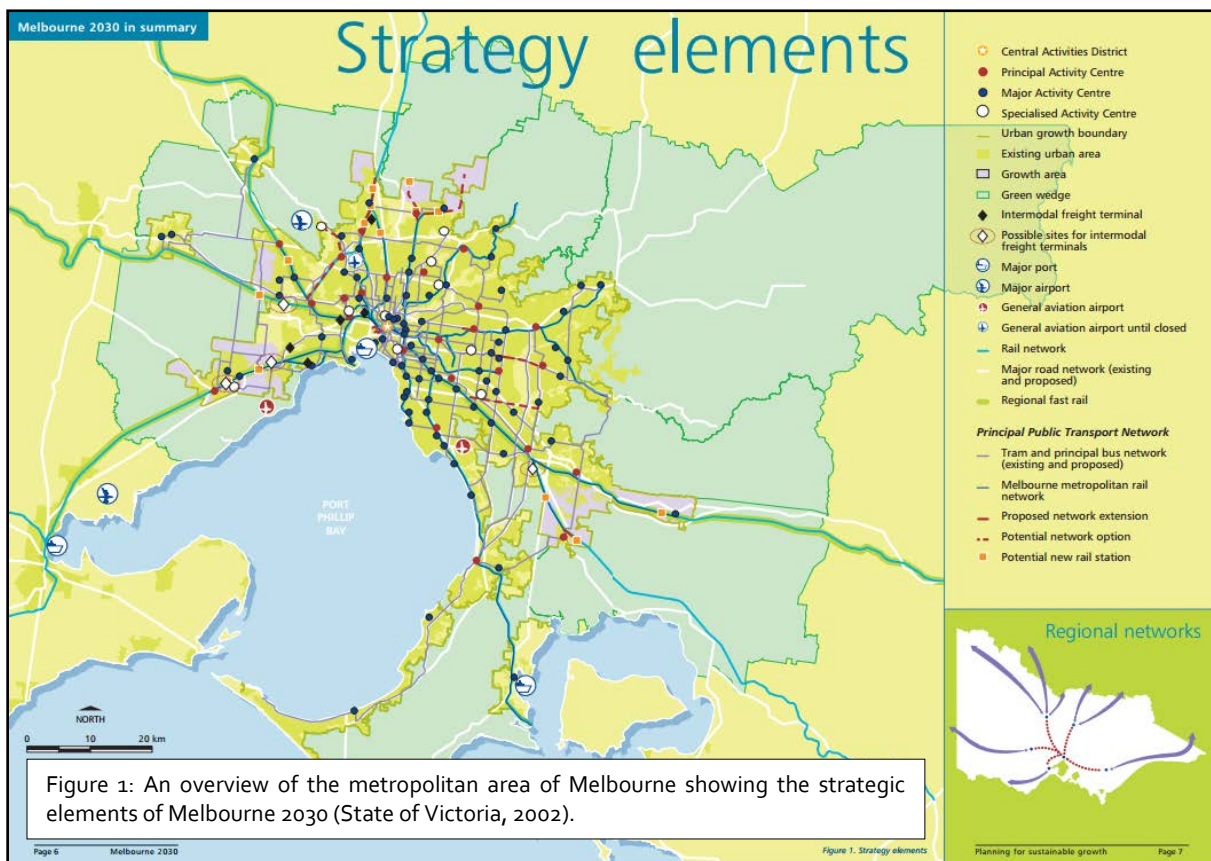
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ABBREVIATIONS

TOD	Transit Oriented Development
OECD	Organisation for Economic Co-operation and Development
CPR	Common-Pool Resource
PD	Prisoners Dilemma
IAD	Institutional Analysis and Development Framework
SES	Social Ecological System
NS	Nationale Spoorwegen (<i>Dutch Railways</i>)
BSD	Bestaand Stads- en Dorpsgebied (<i>Existing City- and Village Area</i>)
VINEX	Vierde Nota Ruimtelijke Ordening Extra (<i>Fourth Memorandum Spatial Planning Extra</i>)
MIRT	Meerjarenprogramma Infrastructuur, Ruimte en Transport (<i>Multiannual Program Infrastructure, Space and Transportation</i>)
WGR	Wet Gemeenschappelijke Regelingen (<i>Law on Common Arrangements</i>)
BBG	Bestaand Bebouwd Gebied (<i>Existing Built Area</i>)
PHS	Programma Hoogfrequent Spoorvervoer (<i>Program Highfrequent Railtransportation</i>)
RAP	Regionaal Actieplan Wonen (<i>Regional Action Plan Housing</i>)

1. INTRODUCTION

At its launch in 2002, the Melbourne 2030 strategy for Transit Oriented Development (TOD) held the promise for a sustainable, equitable, prosperous and accessible city (figure 1). It was acclaimed in international planning circles for its comprehensive model to sustainable growth and regarded as an outstanding example of metropolitan governance by the OECD (Mees, 2011). The appraisal however faded away in the following years as the expected results remained absent. Contrary to the strategy urban sprawl was not redirected from the urban fringe to established areas of the metropolis. Improvements to the public transport network did not come about as crucial public transport investments were not provided. And most noticeably, it failed to create significant residential and commercial development in and around 'activity places': strategic locations with easy access to public transport (Moodie et al., 2008). Unable to live up to the expectations, Melbourne 2030 was declared 'stone dead' by the press in 2009 and eventually abandoned completely by the Victorian government in 2011 (Mees, 2011).



1.1 THE CHALLENGE OF IMPLEMENTING TOD

The story of Melbourne 2030 is symptomatic for Transit Oriented Development (TOD). This integrated land use and transport strategy is essentially about aligning urban growth with public transport. It is recognized and promoted as a comprehensive strategy for sustainable urban development all over the world (Banister, 2012; Curtis et al., 2009). Examples such as Melbourne 2030 nevertheless show how implementation of TOD strategies often hampers in practice. This failing implementation is a struggle of many practitioners and politicians in urban regions and an area of attention in the academic world (chapter 2.1.1).

1.2 THE ROLE OF COORDINATION AND COMPETITION

There is a growing understanding that the reason for the hampered implementation of TOD lies in coordination. It is a challenge to align the actions of the many actors that engage in land use and transport planning (chapter 2.1.4). The recognition of TOD as important strategy alone seems insufficient to make a joint implementation successful. The puzzled statement of the Melbourne 2030 Audit Expert Group is illustrative of that (Moodie et al., 2008, p. 10): *"In undertaking our consultations and reviewing submissions we found it interesting, and something of a paradox, that while there was very widespread support for the underlying directions of Melbourne 2030 there was criticism of the Plan or its implementation from the vast majority of contributors."* In the example of Melbourne 2030 unclear responsibilities, inadequate resources and lacking support, were seen as the three main barriers to its implementation (Moodie et al., 2008). It highlights how the coordination of land use and transport planning is shaped by the institutional context of actors and their relations.

In many other cases all over the world various other often context-specific institutional barriers to implementation of TOD are identified (Banister, 2005; Clifford et al., 2005; Tan et al., 2013). Although the understanding of institutional barriers to TOD implementation is growing, there is relatively little progress made when it comes to the role of inter-municipal competition. Its impeding effect on coordination is generally acknowledged, but hardly further discussed in TOD literature. It is surprising that competition is relatively neglected as it manifests itself even in the 'success stories' of TOD (Suzuki et al., 2013; Thomas and Bertolini, 2014). Therefore it is paramount to explore how inter-municipal competition affects the implementation of TOD. Understanding the role of competition may be the key for unravelling the 'paradox' in Melbourne 2030 and many other instances of TOD.

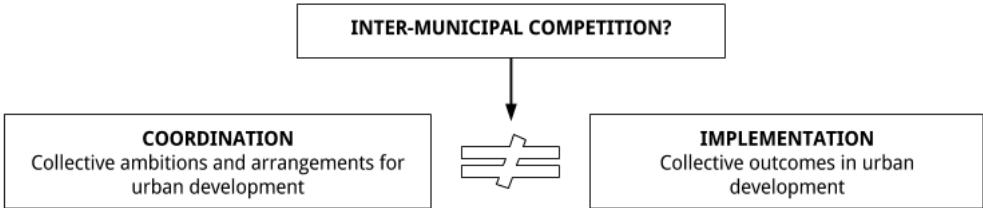


Figure 2: Schematic representation of the unspecified role of inter-municipal competition in TOD (Author, 2015)

1.3 PARALLELS WITH CPR

TOD literature offers little theoretical support on this matter. Due to this clear knowledge gap inspiration is drawn from institutional theories on Common-pool resources (CPR), which as far as known have not yet been applied to TOD. These theories are widely used in the social sciences to explain how various institutional arrangements can solve collective-action problems. CPR-problems are characterised by the paradox that individually rational choices can result in collectively irrational outcomes (McGinnis, 2011; Ostrom, 1990; Wade, 1987). Possibly TOD shows characteristics of this very same paradox. The presence of inter-municipal competition, suggests that municipalities face the individually rational choice to compete in land use and transport planning, despite institutional arrangements for inter-actor coordination (chapter 2.1.5). These individual choices may cumulatively result in a lack of implementation of TOD in the wider urban region. This is a collectively irrational outcome, as transit-supportive development patterns do not emerge in the urban region and a clear modal shift from car towards public transport remains absent.

1.4 EXPLORING THE VALUE OF CPR-THEORIES IN TOD

RESEARCH OBJECTIVE

The apparent discrepancy between the common interest and the collective outcomes calls for innovative approaches to TOD. The theories on CPR may provide a new framework for exploring the implementation 'paradox' of TOD and the role of inter-municipal competition in particular. This approach leads to a research objective that reads: *The goal of this research is to contribute to the implementation of Transit Oriented Development by exploring how the institutional theories on Common-pool resources can provide a theoretical framework for understanding the role of inter-municipal competition in the coordination of land use and transport planning.*

RESEARCH QUESTION

This research objective can be summarized into a central research question that reads: *How can the CPR-framework help understand the role of inter-municipal competition in the implementation of TOD?*

PARTIAL RESEARCH QUESTIONS

The answer for this research question is provided by means of a number of partial research questions. These are consecutively:

1. *What are the criteria for implementation TOD?*

This question aims to develop a good understanding of what comprises TOD. The physical and institutional criteria for the integration of land use and transport are identified by means of a literature review.

2. *What is known about inter-municipal competition in TOD and in general?*

With this question the notion of competition among municipalities is developed as much as possible before drawing on institutional theories for CPR.

3. *How does institutional theory define a Common-pool resource?*

The purpose of this question is to gain comprehension of the concept of a CPR. Based on an overview of institutional theory the conditions under which a CPR can exist and its defining characteristics are discussed. This understanding is used to create clues for recognizing and interpreting a CPR in the 'new' context of TOD.

4. *How could inter-municipal competition in TOD be conceptualised in the CPR-framework?*

The results of the previous three questions create an understanding for the possibilities and limitations for conceptualising TOD as a CPR.

5. *What is the explanatory power of the CPR-framework in the practice of TOD?*

With this question the hypothetical CPR-framework is tested for empirical validity. Its appliance in practice should moreover display what value the conceptualisation has for understanding the role of inter-municipal competition in the implementation of TOD.

STRUCTURE OF THE RESEARCH

The main structure of this thesis is displayed in table 1. For each of the subsequent chapter an indication of the contents is provided.

Table 1: Structure of the thesis

CHAPTER	TITLE	CONTENTS
2	Theory	Contains a literature review of criteria for the implementation of TOD and creates and understanding of CPR. Combined this information results into a conceptualisation of TOD in the CPR-framework.
3	Methods	Accounts for the methodological choices that are made in this research and explains how empirical data is obtained and processed.
4	Case study	Contains the results of the empirical research that is retrieved for three cases of regionally coordinated TOD (supplemented by Appendices V - VII)
5	Cross-case comparison	Analyses and interprets the empirical research by comparing the results across the three cases.
6	Discussion	Discusses the validity and value of the CPR-framework for understanding the role of inter-municipal competition in implementation of TOD.
7	Reflection	Summarizes the relevance and limitations of the research and provides recommendations for further research.
	Appendices	The main thesis report is supplemented by a number of Appendices. Of particular importance are the Appendices V - VII. These contain additional data that support the information in the case study (chapter 4).

2. THEORY

This chapter contains a literature review of TOD in chapter 2.1. This is followed by a short review of the institutional theories on CPR (chapter 2.2). In the conceptual model in chapter 2.3 these two theoretical strands are combined into an analytical framework for the implementation of TOD.

2.1 TRANSIT ORIENTED DEVELOPMENT

2.1.1 BACKGROUND TO TRANSIT ORIENTED DEVELOPMENT

In society and among urban planners there is a broad understanding that the current car-dependent and carbon-based development path is unsustainable. It poses a threat to the environment (pollution and climate change), the economy (congestion, which impedes economic growth) as well as to society (safety and inclusion). Further motorization and urban sprawl makes these challenges increase globally. The challenge is especially large in developing countries, which witness unprecedented rates of urbanization (Banister, 2012; May, 2013; UN Habitat, 2009).

Transit Oriented Development (TOD) is a strategy for sustainable urban development that responds to these challenges. TOD is a comprehensive approach to transport and land-use planning in which urban development and public transport are aligned. In it urban development is concentrated around stations to encourage the use of public transport. Simultaneously public transport systems are developed to connect existing and planned concentrations of development (Curtis et al., 2009). That way TOD should provide a competitive alternative to the car-oriented transport environment that prevails in many cities. The precise definition and materialization of TOD depends on the circumstances and place. It is however typically associated with urban areas that are high in density, contain a mix of urban function, have fine-grained structure that encourages walking and cycling (figure 3). When paired with a range of high-quality option, public transport usages thus becomes convenient and desirable. Cities complying with TOD are believed to transform to better accessible places in which economic competitiveness, environmental conditions, human interaction and social equity are improved (Banister, 2012; Clifford et al., 2005; Dittmar and Ohland, 2004; Kamruzzaman et al., 2014; Suzuki et al., 2013).

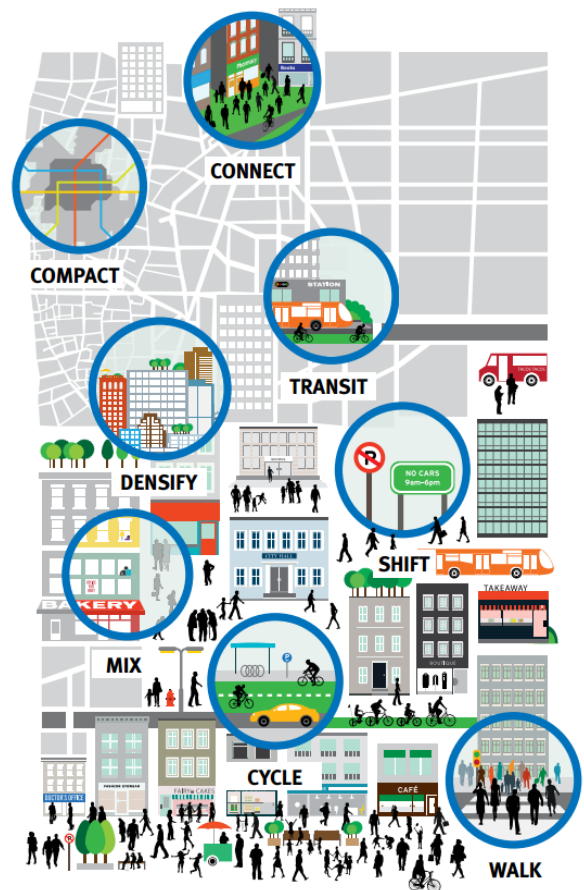


Figure 3: A visualization of some of the 8 key elements from the UN endorsed 'TOD standard' (ITDP, 2014)

2.1.2 LAND USE AND TRANSPORT INTERACTION

Central to TOD is the understanding that there is a relation between the spatial lay-out of cities and the human mobility (Clifford et al., 2005; Curtis et al., 2009; Suzuki et al., 2013). It is evident that suburbanization and the rise of the car are related. Just like the prevalence of public transport in dense urban cores. The interplay between transport and land use is formalized in the 'land use and transport feedback cycle' (Wegener and Fürst, 1999). What it shows is that transport and land use are essentially co-dependent and mutually reinforcing.

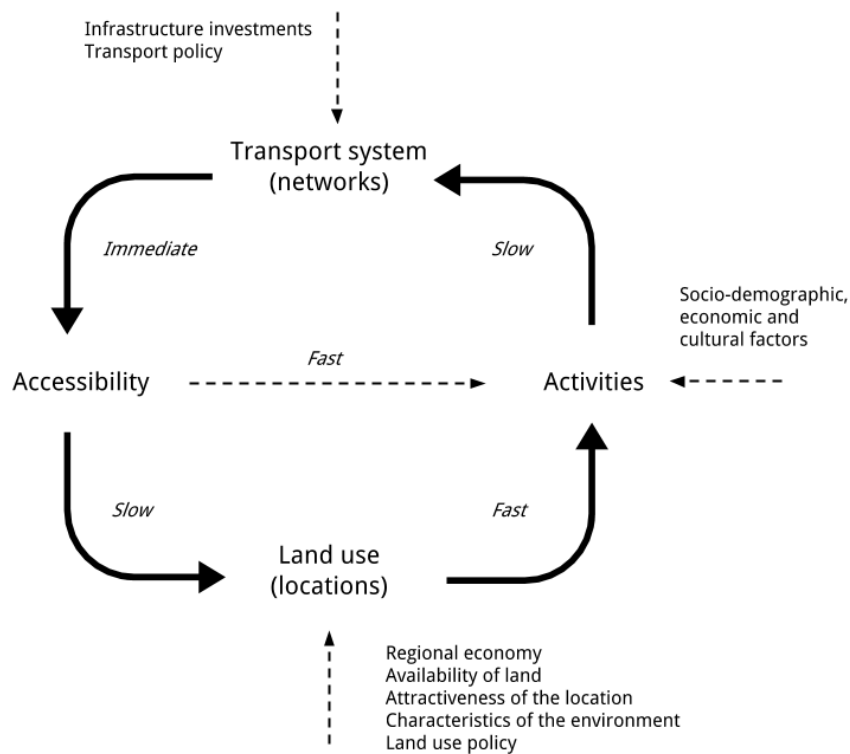


Figure 4: The land-use and transport feedback cycle (Author; 2015, based on Bertolini, 2009; Wegener and Fürst, 1999)

The land use and transport feedback cycle

In the cycle land use influences the transport system (figure 4). For the distribution of functions across space determines the location of human activities, which in turn requires people to make use of certain modes of transport to overcome the distance. In turn, the transport system influences the land use. For the distribution of transport infrastructure and services shapes the opportunities that people have to travel across space. The accessibility of a place determines its attractiveness and thereby co-determines investments and location decisions of people, which results in changes in the land-use. From which the cycle starts over.

The speeds at which these processes take place vary between elements. Human activity patterns can adapt relatively quickly, while spatial structures and transport systems take much more time. This can evoke multiple, sometimes contradictory movements. Changes in accessibility can quickly alter activity patterns, while the influence on the land use becomes visible over a far longer period of time (Bertolini, 2009; Wegener and Fürst, 1999).

The cycle is furthermore affected by many exogenous factors. Human activity patterns for instance are not merely dependent on the spatial setting. Instead they are primarily shaped by wider socio-economic trends and developments (Banister, 2005; Hull, 2011). Similarly transport systems are influenced by more than the demand for mobility. The supply of technology, investments and policies also determines their course. Development of spatial structures as well is much more than a function of accessibility. It depends on the regional economy, land availability¹ and the spatial characteristics (Bertolini, 2009; Wegener and Fürst, 1999).

¹ Among which the use of municipal authority over land uses (chapter 2.1.5).

Understanding TOD from the feedback cycle

The land use and transport feedback cycle forms the main theoretical frame for TOD. From the cycle it can be understood how land use with increasing density and functional diversification results in human activity patterns that are more concentrated (Banister, 2012; Clifford et al., 2005; Hull, 2011). This changes the demand for mobility. High-capacity transport modalities such as public transport will become more attractive since they can effectively handle the more intense flows of human activity (Bertolini and Le Clercq, 2003; Curtis et al., 2009). Conversely low-capacity modalities such as the car will become less attractive because their limitations for dealing with intensive flows. The car will also become less of a necessity as the proximity of functions puts a more diverse range of activities within walking or cycling distance. When the transport system supports more alternative modes of transport, this has direct implications for the accessibility. Location-decisions and investments are more likely to be aimed at places that have this accessibility, thereby re-enforcing land use patterns based on public transport. The exact influences in this chain of events are still disputed, but the interdependency between them is generally acknowledged in academic literature (Banister, 2005; Hull, 2011).

2.1.3 INTEGRATION ACROSS SCALE LEVELS

It is only through careful integration of land use and public transport from the very local level up to the urban-regional level, that TOD can successfully provide an alternative for the car (Curtis et al., 2009; Suzuki et al., 2013; Thomas & Bertolini, 2014). The dynamics between transport and land use are therefore articulated here at three distinct scale levels of TOD:

1. The station: A single public transportation stop or interchange, which gives access to a certain number of transportation modes (node value) as well as a certain number of activities in the adjacent urban development (place value) (Bertolini, 1999; Dittmar and Ohland, 2004).
2. The corridor: A number of stations along a public transport line that together form a distinct trajectory of origins and destinations within an urban-regional network. It is the smallest scale at which TOD can be coordinated in a coherent way, without having to deal with the full complexity of the entire network. This makes it "a logical unit for coordination transport and land use developments at a regional level" (Chorus, 2012, p. 172).
3. The urban-regional network: A total of multiple corridors of various character, function and size that together form a network of transport and urban functions in the so-called 'daily urban system'. It is at this scale that integration of land use and transport can be most effective in making a shift of human activity patterns towards public transport happen. Urban-regional implementation therefore is seen as a success factor to TOD (Hull, 2011; Thomas and Bertolini, 2014).

The station

Land use and public transport integration is most visible at the local level of the station and its surrounding area. The station can be thought of as a 'gateway' that is simultaneously an origin for travel (accessibility to activities elsewhere) and a destination for travel (accessibility to nearby activities) (Dittmar and Ohland, 2004). The character of the 'gateway' is determined on the one hand by the available public transportation modes and the connections to the wider network. On the other hand the concentration of activities (houses, offices, shops, facilities) in the 'catchment area' of the station is crucial. The catchment area is the radius of influence from which people are willing to travel to and from the station by feet or bicycle. As a rule of thumb this is 800 meters (based on a 10 minute walk), but other distances are used as well (e.g. Guerra et al., 2012; Suzuki et al., 2013).

According to Dittmar and Ohland (2004) three spatial characteristics are key in the the ability to draw travellers from the catchment area to the station (and vice versa): Density, Diversity and Design. Higher density usually equals a higher concentration of people and activities. More diversity of land-uses allows for a mix of activities. This creates different types of travellers at various moments throughout the day. It also

allows for more combination of activities, which from a time-geographic perspective reduces 'coupling constraints' in human interactions (Hägerstrand, 1970). Good urban design of the station area can create a safe and attractive environment for the inhabitants and the pedestrians and cyclists in particular. In the words of Banister (2012, p. 5): "Public transport interchanges with associated high-density complementary activities become the new nodal points for activity, and this also generates the possibility of these nodes becoming places to meet and spend time and money, rather than spaces to just pass through as quickly as possible".

Node-place dynamics of stations

The notion of the station as focal point for human interaction also forms the basis for the node-place model of Bertolini (1999)(figure 5). It conceptualises the station as a node in the transport network (it gives access to public transport) and a place in the urban-region (it gives access to activities).

In order to optimize TOD the model postulates that the level of accessibility of the node needs to be paired with the level of accessibility of activities of the place. In that way "*intense and diverse flows of people have the potential of translating into equally intense and diverse patterns of human interaction*" (Bertolini, 1999, p. 200-201). The dotted diagonal line in the model represents the axis at which node and place are in balance. The area that from a TOD perspective is most optimal is indicated by the term 'accessibility' in the middle of the model. These stations combine some level of public transport with some level of activities. They do not lack either activities (the 'unsustained node' situation), nor public transport (the 'unsustained place' situation). There is furthermore no lack of both activities (place value) and public transport (node value), which would make the station 'dependent' on other factors than accessibility. Nor does there exist a situation of 'stress' in which high concentrations of public transport and activities can potentially lead to conflict over multiple extensive claims on a limited space (Bertolini, 1999).

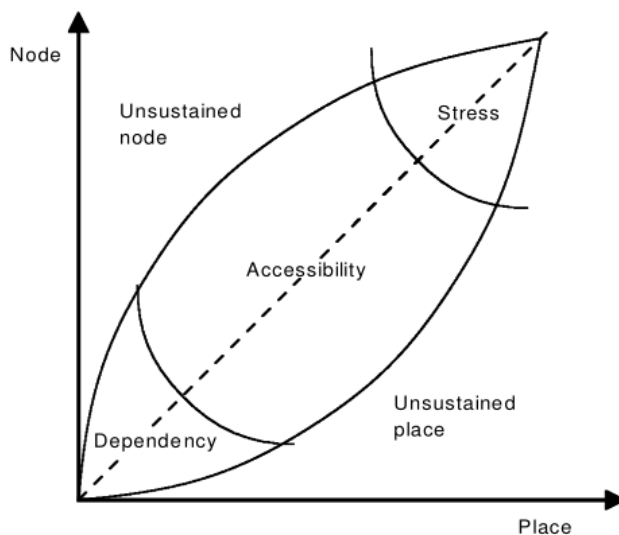


Figure 5: The node-place model (Bertolini, 1999)

Several applications of the node-place model show that the linear connection between node- and place-content is too simplistic (Reusser et al., 2008; Chorus and Bertolini, 2011). Here the influence of the exogenous factors, as identified in the land use and transport cycle, can be recognized again (see chapter 2.1.2). The node-place model can however be used to help discover locations that at which there is enough transport provision to accommodate further concentration of urban functions and vice versa. Equalizing the node- and place value of station locations inherently involves a perspective that exceeds the local level.

Higher-scale level interactions

A perspective on TOD that only concerns itself with the integration of land use and transport at station locations is too limited. In order to successfully implement TOD the so-called 'daily urban system' needs to be concerned. This is the geographical area at which the majority of the urban mobility between daily human activities such as living, working and leisure take place. In addition to that it highlights the economic integration of such an area at the urban-regional level. Therefore it is sometimes referred to as 'functional urban area' at which markets for jobs, real estate and transportation can be seen as interlinked, regardless of the various spatial forms that (networks) of cities may have (Antikainen, 2005; Peek et al., 2006; Vandermotten et al., 2008).

The significance of the urban-regional level from a transport perspective calls strongly for a whole journey approach that focuses on the entire trip, from origin to destination (Suzuki et al., 2013; Curtis et al., 2009). The integration of and transition between combinations of transport modes determines whether public transport can create a door-to-door experience that poses an alternative for travel by car. The delivery of such a transport system depends on the location of urban functions (i.e. the land use and transport feedback cycle in chapter 2.1.2). It is only through sufficient possibilities for living, working and leisure nearby high-quality public transport that human activity patterns can shift away from the car (Clifford et al., 2005; Dittmar and Ohland, 2004). As Bertolini et al. (2012, p. 39-40) states "*the geographical focus is not so much on major, but inevitably exceptional station area projects, but rather on coherent combinations of 'ordinary' transport and urban projects, some large, but many small, aimed at redirecting the development of entire regions towards public transport networks, and away from the car*". This means that TOD needs to consider the cumulative effects of land use and transport integration to create be successfully implemented (Banister, 2005; Hull, 2011; Suzuki et al., 2013).

The corridor

There is large difference between the dynamics at single stations and the urban region. The corridor can be seen as the scale level that can bridge these differences (Bertolini and Rietveld, 2008 in: Chorus, 2012). In the context of TOD a corridor can be defined as a number of stations along a public transport line that together form a distinct trajectory of origins and destinations within a daily urban system. Arguably it is the smallest scale at which TOD can be coordinated, without having to deal with the full complexity of the entire urban-regional network. Based on a study of the success of TOD in Tokyo Chorus (2012, p. 172) calls it "*a logical unit for coordination transport and land use developments at a regional level*".

Following the node-place model every station can be regarded as "*part of a system of both competing and complementary nodes and places*" (Bertolini, 1999, p. 201). In the corridor these dynamics can play a role too. The ultimate value of TOD is determined by the covariance and co-dependence of stations in the corridor and the resulting synergies that do or do not follow from these combinations (Dittmar and Ohland, 2004). In TOD, Peek et al. (2006, p. 444) remark, this: "*Synergy makes the whole more than the sum of its parts, and it can be defined as the added value of coherence as result of collaboration,*" Achieving synergy in the corridor calls for differentiation of station development in terms of size, function and identity (Chorus, 2012):

- Hierarchical development patterns: urban development is most concentrated (i.e. highest density) at the beginning and end of a railway corridor, with some additional higher concentrations in between.
- Diversified functional patterns: relatively mono-functional use is found at the beginning and end of the railway corridor, while the most diverse mix of land uses is concentrated in the middle of the trajectory (e.g. universities, amusement, and leisure).
- Unique identities of TOD sub-centres: stations are encouraged to reflect the local character and supplement existing business and retail.

Deliberate alignment of the node-place value of multiple stations can result in better utilization of the capacity of the public transport within a corridor. It can create bi-directional and off-peak hour travel, which in turn

generates more activities over the course of the day (Banister, 2012; Bertolini, 2012; Hull, 2011). A higher and steadier flow of visitors and customers can be drawn. The value that this creates can be capitalized in land and property values or public transportation revenues. Some of this added value can be captured and re-invested to solidify and expedite TOD (Curtis et al., 2009; Dittmar and Ohland, 2004; Suzuki et al., 2013). The downside of these mechanisms in TOD is the fact that in cases of insufficient functional differentiation and diversity of catchment areas, the individual stations in the network may compete with each other.

2.1.4 ACTORS AND COORDINATION

The implementation of TOD requires coordination and collaboration between multiple actors across different scale levels ranging from single projects to corridor and entire metropolitan networks. In TOD none of the involved actors has the power and means to plan and implement projects on their own (Switzer et al., 2013). Instead there is an asymmetric and mutually dependent relationship between the various actors. In Appendix I the interests and relationships are further elaborated for the main categories of actors: governments (also see chapter 2.1.5), transportation providers, the community and developers. The heterogeneous array of actors involved and the variety of views that they hold often creates a situation in which there is no clear agreement on what TOD should accomplish from a functional standpoint (Bertolini et al., 2012; Dittmar and Ohland, 2004). In order to implement TOD these diverting interests, goals, ideas and concerns of the various actors needs to be aligned. This makes the multi-level integration of land use and transport a complex institutional challenge that involves the "rules' (legislation, policy, practice, roles and responsibilities) and the relationships (between organizations, between players within institutions, and between organizations and the wider community" (Curtis et al., 2009, p. 4).

Specificity of institutional barriers to implementation

Consequently the implementation of TOD is often riddled with 'institutional barriers' (Clifford et al., 2005; Hull, 2011; Rietveld and Stough, 2005). These barriers may lie in overlapping responsibilities, conflicting organizational structures, inadequate regulations, division of (financial) resources, different professional practices, political and/or public attitudes, and many other examples (recall *Melbourne 2030* in chapter 1). Understanding them requires attention for the specific circumstances. Every context of TOD consists of a unique configuration of spatial, social, economic, technological and political factors, which is embedded in past trajectories and subject to contingencies (Pflieger et al., 2009).

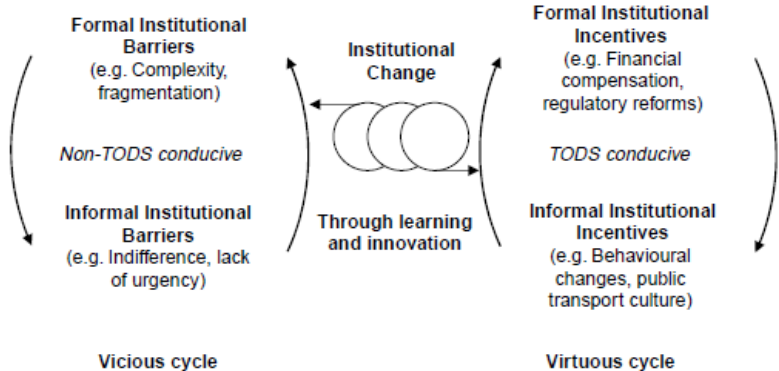


Figure 6: Model of the transition to TOD conducive institutional environments (Tan et al., 2013)

Therefore in cases where TOD implementation proves a challenge, there may be context-specific institutional barriers present that create a non-conductive environment for TOD. Tan et al. (2013) proposes a model to institutional change in which these context-specific barriers are identified and overcome with fitting incentives (figure 6). This 'contextualization of problems and solutions' can help to create a context that is conducive to TOD implementation (Tan et al., 2014).

General success factors for implementation

However important context-specificity is, the richness and depth of case study findings at a certain point has to be translated to generalisable lessons in order to accumulate knowledge. The insights into the institutions that 'maximize' the effectiveness of TOD help to create the CPR-framework in chapter 2.3. By comparing cases systematically the interplay between general and specific explanations in determining the outcome of TOD implementation can be better understood (Bertolini et al., 2012). For this purpose Thomas and Bertolini (2014) developed a meta-analysis that consists of 16 so-called critical success factors grouped around 3 categories: Plans & Policies, Actors, and Implementation. Paired with the insights of others successful implementation of TOD relies on:

Plans & Policies

TOD requires plans and policies that are supportive, stable and consistent over time and across multiple levels of government. TOD principles should thus be 'institutionalised' to "*provide continuity and coherence to TODS implementation through either governance restructuring or establishment of regional authorities and plans*" (Tan et al., 2013, p. 44). One element is a strategic framework that on an urban-regional scale provides a vision for land use-transport planning or urban sustainability (Thomas and Bertolini, 2014), and more specifically "*asserts where centres need to occur, in what density and mix*", and that: "*links its centres with a rapid transit base, almost invariably with electric rail.*" (Newman, 2009, p. 13). When backed up by political support on both the national and local level good vertical integration (local-regional) and horizontal integration (between local authorities) can take place (Clifford et al., 2005). This brings about a situation in which concrete policies; funding, taxes and plans are or can be easily made consistent with TOD principles.

Actors

The coordination of plans and policies that support TOD is performed by actors who hold a certain position in terms of interests, goals, means, and roles (Appendix I). A high-quality relationship between actors at a regional level is therefore seen as key. This requires attention to communication, openness and mutual understanding of each other's positions and differences. In forming coalitions inter-actor trust especially is an asset that needs to be created and maintained in order to overcome cultural-institutional differences (Switzer et al., 2013). In support of that many authors advocate for a regulatory regional land use-transportation body that fosters the multidisciplinary implementation of TOD and should prevent inter-municipal competition (Curtis et al., 2009; Suzuki et al., 2013; Thomas and Bertolini, 2014). In addition to that behavioural change and a shared belief system: a climate of public acceptance or - preferably - support of TOD in conjunction with key visionaries are seen as important prerequisites (Clifford et al., 2005; Hull, 2011; Tan et al., 2013).

(Financial) implementation

TOD implementation also has a strong financial component as appears from Newman's (2009, p. 13) call for: "*a public-private funding mechanism that enables the transit and the TOD to be built or refurbished through a linkage between the transit and the centres it will service*". This asks for regional level planning of coherent TOD alongside widespread transit corridors in conjunction with site-specific planning tools that increase the attractiveness of TOD for developing actors. For example through bonuses to developments with higher Floor area ratio (FAR), leasing of air rights and other methods to boost densities at particular places (Thomas and Bertolini, 2014). Other risk- and profit sharing mechanism should boost the willingness to experiment with policies, practices and tools and create the incentive for developers to invest in TOD (Tan et al., 2013).

2.1.5 THE ROLE OF GOVERNMENTS

Governments can take a key position in providing a timeframe and strategy that gives the long-term stability that is required for implementation of TOD. As representative of the 'public interest' they have the broadest mandate of all actors in TOD (see Appendix I). Governments control many of the 'institutions' that can influence the opportunities of TOD (e.g. policies, budgets, taxes, rules and regulations). They also are expected to prioritize between a wide range of interests: ranging from sustainability and economic

competitiveness on a (inter)national level to assuring income and pleasing constituents on a local level. Redevelopment of underutilized land, revitalization of neighbourhoods, fostering economic vitality (creating jobs), and maximizing tax revenues are just a few of the many - sometimes conflicting - interests that governments have (Dittmar and Ohland, 2004; Suzuki et al., 2013). However rather than a single actor, governments consist of a multifarious groups of entities that are the result of the "*many existing separations between government levels (federal, state, regional, municipality) and sectors (transport, land use)*" (Bertolini et al., 2009, p. 262).

Inter-municipal competition

Establishing effective inter-governmental linkages to foster TOD is therefore no easy feat. Competition between municipalities in particular seems to be a common barrier, which even manifests itself to some degree in 'success stories' of TOD (Thomas and Bertolini, 2014). Suzuki et al. (2013, p. 150) for instance state that "*Political and economic competition among municipalities often impedes the coordination of planning, investment, and service provision across administrative boundaries*". From public choice theory this phenomenon can be understood as 'geographical competition' (Boyne, 1996). It represents the competition between municipalities in different geographical areas for a share of the market in households and businesses. Municipalities have the incentive to increase their competitiveness in this market as this leads to economic benefits for the municipality in question (e.g. a larger tax-base, more employment) (Dollery and Wallis, 2001; Gerritse, 2014). The increase in welfare will likely be rewarded by voters through (re-)election of the decision-makers that are responsible. It moreover prevents households and firms to 'vote with their feet' and leave the jurisdiction. Ideally this encourages local policies that are responsive to public preferences and efficiently use resources (Boyne, 1996). Depending on the specific government structure municipalities has various policy instruments to their disposal for these purposes. Next to financial means such as taxes and subsidies, other services and goods can be provided or procured by municipalities. Examples are physical infrastructure, education, talented labour pools, credit provision, land availability, land uses (Gerritse, 2014). Among these instruments the authority of municipalities over land use can be seen as something of particular importance, as it is vital in the coordination of TOD (Hull, 2011). Depending on the discretion given by higher-tier government, local authorities can influence the distribution of development rights and pose restrictions of urban developments within their jurisdiction (see chapter 2.1.3).

Undesirable outcomes of competition

Local policies in many cases however do not lead to such optimal results (for an overview see Dollery and Wallis, 2001). Even when local governments perfectly act for the interests of their constituents, competition can still result in undesirable outcomes for the wider geographical region or even the entire world. This happens in particular when municipalities – due to competition – do not take into account all the consequences that their local policies have for others (Gerritse, 2014). A paradox also seems to be present in TOD (chapter 1). In TOD this arguably manifests itself in externalizations in space; since "*decisions in land use management of local authorities can have negative repercussions for the broader region*" (Suzuki et al., 2013, p. 169). And they may also be externalized in time. This is what Hull (2011) refers to when she states that local politicians are inclined to adopt short-term strategies in which local economic interest is prioritized over long-time environmental quality. These and other dynamics are incorporated into the Common-pool resource framework for TOD in chapter 2.3.

2.2 UNDERSTANDING COMMON-POOL RESOURCES

From the previous chapter it can be understood how the rational, self-interested land use and transport decisions of municipalities in competition may cumulatively lead to spatial development patterns that do not necessarily support TOD on an urban-regional level. The synergies in the urban-regional network may not arise (chapter 2.1.3). Consequently the collective of municipalities may miss out on the benefits of sustainability and accessibility that are believed to come with TOD (chapter 2.1.1). This could be called the 'Tragedy of TOD', in which the collective outcome of land use and transport policies opposes the interest of the municipalities, but seem unavoidable because of inter-municipal competition (2.1.5). Common-pool resources (CPR) risk outcomes that seem equivalent to that of TOD. To be able to draw on the institutional theories for CPR, they are set out in this chapter. In chapter 2.2.1 and 2.2.2, the definitions of a CPR and the condition under which it can exist are laid down. This creates an understanding of the problem that a CPR embodies. In chapter 2.2.3 the possibility of establishing institutional arrangements for the 'management' of a CPR is discussed. A pivotal role for understanding the risk on CPR is fulfilled by the institutional Design Principles in chapter 2.2.4. Combined this information is used as theoretical basis for a new framework that explores TOD as a CPR in chapter 2.3.

2.2.1 THE TRAGEDY OF THE COMMONS: THE RATIONALE BEHIND A CPR

The paradox of a CPR is often illustrated by the well-known 'Tragedy of the Commons'. In this metaphor Hardin (1968) describes a situation of herders using a common grazing meadow free to all. The herders know that a surplus of animals would result in overgrazing and consequent deterioration of the common meadow. Still as a rational being that seeks to maximize his production, each herder is motivated to keep adding animals to his herd because he receives the direct benefit from the sale of his animals and bears only part of the costs of the overgrazing of the common meadow. By means of this metaphor a further understanding of the CPR is given in this chapter.

The rationale behind a CPR can be further clarified by formalizing it in a prisoner's dilemma (PD) model. A PD is a puzzle that illustrates the basic conflict between individual and group rationality (Kuhn, 2014). Although it originally involves prisoners (hence the name of the model), Ostrom (1990) uses the 'Tragedy of the Commons' metaphor to describe the PD's mechanics. The players in this game are two herders that jointly use the common. The herders play a non-cooperative game, which is characterised by full information - regarding the outcome of choices - for the herders, but no communication between them (Kuhn, 2014). Both herders know that the common meadow can sustain a maximum amount of animals. And consequently they know the optimal amount of animals for each herder (half of the optimal number, which would result in 10 units of profit each). They both have the choice to cooperate (C) or defect (D). This results in 4 possible outcomes represented in figure 7.

The 'dilemma' that the herders face is that, whatever the other does, each herder is better off defecting (D) the other rather than cooperating (C). For if one herder cooperates (limits his herd to the optimum half), the

other herder may defect (i.e. increase his herd above the optimum half of animals). This would give the defecting herder 11 units of profit at the cost of the cooperating herder, who makes 1 unit loss. The outcome in which both herders defect (D,D) is however the least favourable result from their collective standpoint as it gives both herder zero units of profit. If they would have both cooperated (C,C) they would have both obtained 10 units of profit. That latter situation is what is called the Pareto-optimum: "an outcome where there is no

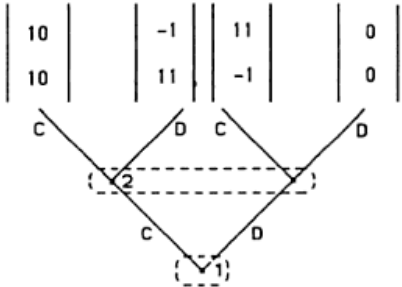


Figure 7: The Hardin herder game (open-access situation) (Ostrom, 1990)

other outcome strictly preferred by at least one player that is at least as good for the others.” (Ostrom, 1990, p. 5). The paradox that the rational, self-interested behaviour of individuals leads to this Pareto-inferior (suboptimal) outcome for a group as a whole forms a fundamental challenge to society. For “unless the number of individuals is quite small, or unless there is coercion or some other special device to make individuals act in their common interest, rational, self-interested individuals will not act to achieve their common or group interests” (Olson, 1965 in Ostrom, 1990, p. 6). The coercion or the ‘special device’ that Olson names is in fact some type of institutional arrangement that responds to paradox in a CPR (chapter 2.2.3).

2.2.2 DEFINING A COMMON-POOL RESOURCE

In understanding a CPR it is important to distinguish between the resource *system*, which is jointly used, and the resource *units*, which are used individually (McGinnis, 2011; Ostrom, 1990). An example would be an irrigation system or common meadow (a resource system) from which each farmer uses a certain amount of water or animals (resource units). This distinction also helps understanding the difference between *users* (*consumers*) and *provider* (*producer*) of a CPR. The producer has a role in the provision and maintenance of the resource system collectively. The consumer uses the resource units individually. In this instance the farmer could be both user and provider, but that is not necessarily so.

Resource types

With this distinction in mind, it is possible to contrast a CPR to other resources (table 2). This is often done by distinguishing four basic types of goods and services based on two criteria: 1) excludability of use and 2) subtractability of use (McGinnis, 2011; Ostrom, 2005; 2012). The first criterion refers to the difficulty of excluding potential beneficiaries from using the resource. Or put otherwise: the cost or effort of excluding free-riders: the people who do not contribute to the provision of the resource system, but nevertheless consume resource units. Subtractability on the other hand refers to the extent to which using the resource subtracts from the availability of the resource to others.

Table 2: Types of goods (Based on Ostrom, 2005; 2012)

		SUBTRACTABILITY OF USE	
		Low	High
DIFFICULTY OF EXCLUDING POTENTIAL BENEFICIARIES	Low	Toll goods	Private goods
	High	Public goods	Common-pool resources

Public goods versus Common-pool resources

In a CPR situation it is difficult to exclude potential beneficiaries from using the resource whilst each use of the resource system also reduces the total availability of the resource. An example of this principle is the farmer who subtracts 1000 litres of water from the irrigation system to grow his crops. Those 1000 litres are not available to other farmers. Similarly when a fisher harvests a ton of fish, those fish are not available to other fishermen. This is where a CPR is different from a public good. When a public good is used there is no reduction of the availability to others. Public security, lighthouses and weather forecasts for example can be used unlimited by multiple users simultaneously (Ostrom, 1990; Wade; 1987). A public good is likely to be under-produced for most producers do not act out of charity and would want compensation. A CPR however is both under-produced and over-consumed, which leads to overcrowding, negative externalities and high social costs (Ostrom, 2011; Wade, 1987). The limited availability of a CPR “tends to deplete (destroy) the resource because most people correctly understand that, even if they themselves abstain from using the resource, the depletion will still not be stopped as others (the free-riders) will deplete it anyway (so there is no point in abstaining oneself).” (Ostrom, 2012, p. 57).

2.2.3 MANAGING A COMMON-POOL RESOURCE

Three ideal-type institutional responses to a CPR

In situations that can be classified as CPR problems there is a case for intervention in order to attain a more Pareto-optimal outcome. There are many possibilities for dealing with free-riding, solving commitment problems, arranging for the supply of new institutions and monitoring individual compliance with sets of rules. Ostrom (1990) identifies three ideal-types of institutional arrangements:

1. *Central-authority*: an external force that controls the use of the CPR
2. *Privatization*: the creation of a system of private property rights
3. *Self-organizing forms of collective action*: internal generated sets of rules for management

In Appendix II these three ideal-type institutional arrangements for management of a CPR are explained in more detail. Each response is illustrated by means of the 'Tragedy of the commons' gaming structure as in chapter 2.2.1. What the different games show is how the slightest changes in the institutions of a CPR can result in disturbance of equilibrium and consequently lead to an outcome that is inferior. It is important to note that these 3 ideal-type institutional simplification of reality (Ostrom, 1990; 2012). An open-access situation void of any institutions will almost never present itself in reality. Nor will the institutions that are created neatly resemble one of the theoretical responses. In reality institutional arrangements are 'rich mixtures' of public, private and self-organizing institutions, that are "*frequently (...) intermeshed and depend on one another, rather than existing in isolated worlds.*" (Ostrom, 1990, p. 15)².

Design principles: a set of underlying general rules for CPR management

There is no clear-cut solution for managing a CPR. Academics however identified a series of underlying general rules that are required to sustain a CPR. These so-called 'Design Principles' are based on the broad similarities among successful and lasting examples of CPR management (Cox et al., 2010; Ostrom, 2005; 2012). The Design Principles touch upon the key challenges that turn up in all CPR management (see Appendix II). These are free-riding, solving commitment problems, arranging for the supply of new institutions and monitoring individual compliance with set of rules (Ostrom, 1990). Rather than prescribing specific rules for these challenges, the Design Principles can be used to identify missing institutions as a source of dysfunctional performance (McGinnis, 2011). Contrary to what the name suggests, the Design principles are first and foremost a diagnostic tool for CPR management (Ostrom, 2005).

The position of the Design Principles in institutional theory

The Design Principles are related to many key concepts in the broader discipline of institutional theory. Many of these concepts have been integrated into the Institutional Analysis and Development Framework (IAD) which has evolved to study the most diverse range of institutional configuration, not merely CPR. Its latest iteration as Social Ecological System (SES) shows in figure 8. It goes beyond the scope of this research to give a full explanation of the many components and layers that embody this multi-tier analytical framework. For an introduction to the Action Situation, IAD, SES and other institutional concepts reference is made to McGinnis (2011) and Ostrom (2011).

For the moment it is sufficient to understand how the Focal Action Situation (where actors consider and select actions) is shaped by the characteristics of the resource (comprised by a *system* and *units*) and the institutions

²This is particularly true for TOD. As multi-scalar, multi-actor strategy, TOD is embedded in a palimpsest of institutional layers (Hull, 2011).

(comprised of a structure of rules and participating actors). These elements are in turn influenced - over time - through the outcomes of interactions in the action situation. The longevity of the SES is determined by these mutual processes. In case of a CPR it is notoriously difficult to stabilize these processes and avoid a tragedy (chapter 2.2.1).

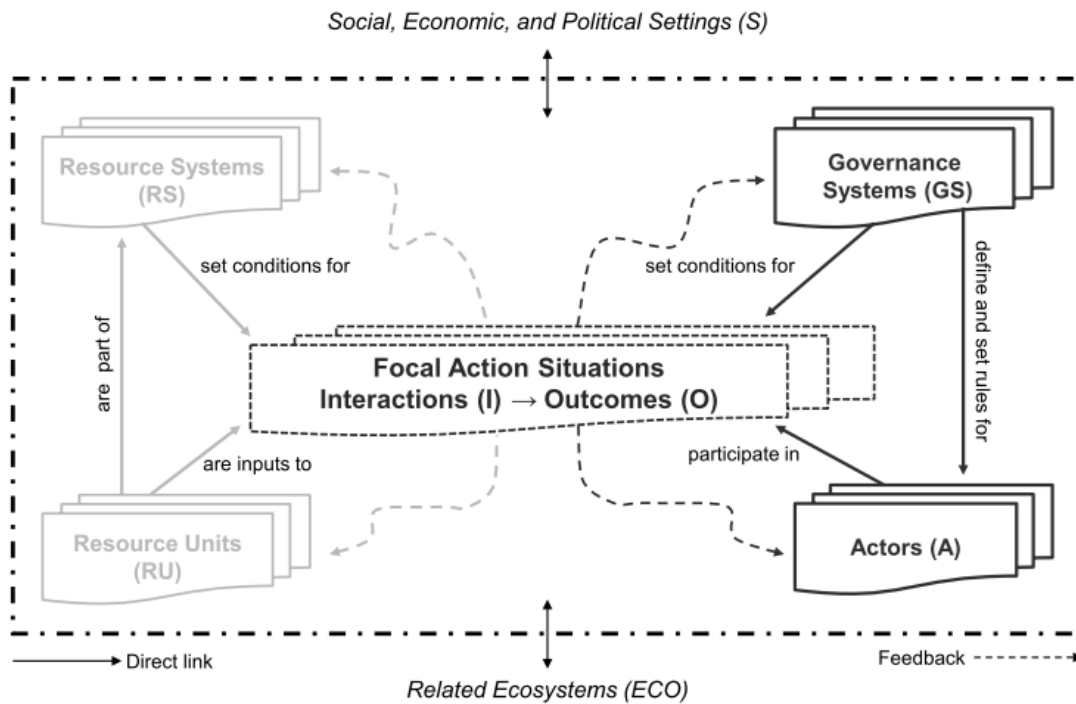


Figure 8: The Social Ecological System (Cole et al., 2013)

Figure 9 depicts the internal structure of the action situation. It shows what exogenous rules (derived from the larger SES) influence key elements in the decision-making processes of actors. Added up together the choices actors produce collective outcomes for the wider SES (McGinnis, 2011; Ostrom, 2005; 2011).

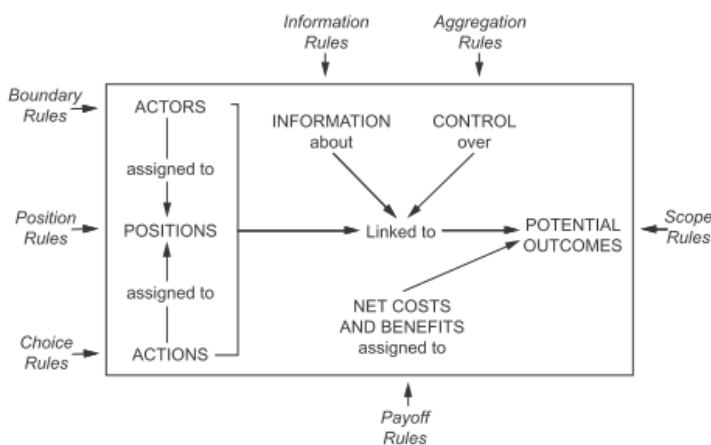


Figure 9: Rules as exogenous variables directly affecting the internal structure of an action situation (Ostrom, 2005)

The big advantage of the Design Principles is that they are tailor-made for analysis of a CPR, but still cover generally all elements of the SES. The 'boundary rules' for example are incorporated into the first Design Principles: Well-defined boundaries. Similarly the elements 'information' and 'control' related strongly to the Design Principle 4: Monitoring (chapter 2.2.4). Using the Design Principles thus avoids the problem of having to perform a full institutional analysis according to the IAD or SES. For: "no one can undertake a complete

analysis of all the potential rules that they might use and analytically determine which set of rules will be optimal for the outcome they value in a particular ecological, economic, social and political setting" (Ostrom, 2005, p. 255). As it is the Design Principles form a more focussed, but still comprehensive analytical frame for a CPR that can be used to provide a perspective on TOD (chapter 2.3).

2.2.4 THE DESIGN PRINCIPLES FOR MANAGING COMMON-POOL RESOURCES

The Design Principles as listed below, are based upon the original 8 Design Principles of Ostrom (1990), but contain a refinement of 3 of the principles as suggested by Cox et al. (2010). In all three cases it concerns the distinction between the user of resource *units* and the resource *system* itself. Each of the Design Principles is shortly outlined below. Based on this general description an operationalisation of the Design Principles for TOD is made in chapter 2.3.2.

1. Well-defined boundaries

- A. *User boundaries*: Clear boundaries between legitimate users and nonusers must be clearly defined
- B. *Resource boundaries*: Clear boundaries are present that define a resource system and separate it from the larger biophysical environment.

The two components of this principle are closely related and both aimed at preventing free-riding. User boundaries can be created by instalment of some form of membership by a group of users of a CPR. This creates the possibility to create greater trust and reciprocity, as well as the possibility to exclude illegitimate users from the resource. The ease with which user boundaries can be installed depends on the characteristics of the resource system. For example more natural boundary markers exist in a grazing land in a mountain valley, compared to an open grassland. And in the case of non-stationary resources such as fish, inshore-fisheries have more clearly demarcated resource system boundaries than their offshore counterparts. Rules of access are rarely clear and uncontested, but rather malleable and fluid, for: *"boundaries may have a gradient quality to them, with the strength of access rights of a particular group to a CPR gradually diminishing or increasing across a certain distance."* (Cox et al., 2010, p. 37).

2. Proportional equivalence between benefits and costs

- A. *Congruence with local conditions*: Appropriation and provision rules are congruent with local social and environmental conditions.
- B. *Appropriation and provision*: The benefits obtained by users from a common-pool resource (CPR), as determined by appropriation rules, are proportional to the amount of inputs required in the form of labour, material, or money, as determined by provision rules.

This second design principle revolves around the equitability or fairness of the system. The inputs of the users need to match the outputs that they receive to ensure the longevity of the CPR system. *"When the rules related to the distribution of benefits are made broadly consistent with the distribution of costs, participants are more willing to pitch in to keep a resource well-maintained, and sustainable."* (Ostrom, 2005, p. 263). That willingness of users to maintain the system depends on the stock of social capital or interpersonal trust as well as compliance to local conditions and culture (Cox et al., 2010; Ostrom, 2012).

3. Collective-choice arrangements

Most individuals affected by the operational rules can participate in modifying the operational rules.

The third principle is that *"most of the individuals affected by a resource regime are authorized to participate in making and modifying their rules."* (Ostrom, 2005). The users of the resource are best suited to modify arrangements, because they best understand the local circumstances and have experiential knowledge of both the CPR and the performance of the existing operational set of rules (McGinnis, 2011).

4. Monitoring

- A. *Monitoring users*: Monitors who are accountable to the users monitor the appropriation and provision levels of the users.
- B. *Monitoring the resource*: Monitors who are accountable to the users monitor the condition of the resource.

Although the importance of reciprocity and trust has been outlined earlier, this alone is not sufficient to ensure conformance to the rules for CPR provision and appropriation. It requires monitor arrangements for both the CPR *users* and the *system*. The monitoring of the system is aimed at collection as much information about the condition of the CPR, which can signal over-consumption and under-production and serve as input for the modification of appropriation and provision rules (Design Principle 2). The monitoring of the users is actually concerned with checking whether or not users comply with these rules in terms of the time at which, the way in which and the amount of units appropriated. As Cox et al. (2010, p. 38) put it: "*Monitoring makes those who do not comply with rules visible to the community, which facilitates the effectiveness of rule enforcement mechanisms and informs strategic and contingent behaviour of those who do comply with rules.*" Like shown in the three types of institutional arrangements (Appendix II) monitoring is often fulfilled by an external actor, possibly in addition with implicit monitoring among users themselves.

5. Graduated sanctions

Appropriators who violate operational rules are likely to be assessed graduated sanctions - depending on the seriousness and the context of the offense - by other appropriators, by officials accountable to the appropriators, or by both.

In order for monitoring activities to have success they have to be translated into action, by modification of the rules (Design Principle 3) and enforcement of the rules (Design Principle 5). The principle of graduated sanctions is that "*sanctions progress incrementally based on either the severity or the repetition of violations*" (Cox et al., 2010, p. 37). Initial sanctions are aimed at revealing the rule breaker to the group of users. On other words not a financial sanction, but one that relies on social ties and reputation at first. For a single or a few infractions may in fact be an unintentional error on the part of the user. This gives the wider group of users the idea that infractions are noticed and proportionally sanctioned. And when infractions do continue they will gradually be sanctioned heavier ultimately forcing that particular user out of the CPR. This reinforces the commitment of other users to the rules, especially when they have a strong moral identification with them (Design Principle 2a).

6. Conflict-resolution mechanisms

Appropriators and their officials have rapid access to low-cost local arenas to resolve conflicts among appropriators or between appropriators and officials.

The rules in a CPR system can be interpreted differently by participants, even when they jointly devised them. In order to ensure trust in and conformance to the CPR arrangements, "*some mechanism for discussing and resolving what is or is not a rule infraction is quite necessary*" (Ostrom, 2005, p. 286). The goal is provide a speedy and efficient dispute resolution along clear and well-established procedures. For example via regular court or tribunal proceedings (Ostrom, 2012).

7. Minimal recognition of rights to organize

The rights of appropriators to devise their own institutions are not challenged by external governmental authorities.

This principle is important in ensuring that the users of the CPR can continually develop more effective arrangements. If the legitimacy of CPR arrangement is not recognised by external authorities, a single (temporarily) dissatisfied participant who opposes a certain rule change could threaten the entire CPR management with the involvement of external authorities (who themselves may lack experiential and local

knowledge to effectively manage the CPR). The then required "*unanimity as a decision rule for changing rules*" would impose "*high transaction costs and prevent a group from searching for better matched rules at relatively lower costs*" (Ostrom, 2005, p. 268).

8. Nested enterprises

Appropriation, provision, monitoring, enforcement, conflict resolution, and governance activities are organized in multiple layers of nested enterprises.

This final design principle relates to the multiple levels of rule-making that fundamentally influence the character of a CPR. These have to relate to each other, or even be combined, to create maximum effectiveness in managing resources at various levels, in what Ostrom (2005; 2012) calls polycentric institutions. The institutional arrangements in these systems are made in such a way that "*each unit exercises considerable independence to make and enforce rules within a circumscribed domain of authority for a specified geographical area*" (Ostrom, 2005, p. 283). Cox et al. (2010) uses the example of cross-scale physical relation such as in irrigation systems that are part of a larger hydrological system, and thus require cross-scale cooperation. Other examples are larger governmental systems that ensure property rights and can intervene in case of a smaller system fails (e.g. corruption within a CPR). Polycentric institutions allows for local knowledge to be used, but also enable horizontal (experiences from other subunits) and vertical learning (scientific knowledge form larger units) (McGinnis, 2011).

The understanding of the Design Principles and other institutional theories on CPR in this chapter is linked to TOD in chapter 2.3.

2.3 TOD IN THE CPR-FRAMEWORK

In this chapter the theories on TOD (chapter 2.1) and theories on CPR (chapter 2.2) are combined to a new analytical framework. This framework provides a new perspective on the implementation difficulties of TOD that explicitly incorporates inter-municipal competition. In chapter 2.3.1 it is discussed how TOD can be conceptualised as CPR. Based on this definition chapter 2.3.2 creates an operationalisation of the Design Principles for CPR for the analysis of TOD. This preludes the conceptual model of this research (chapter 2.3.3).

2.3.1 CONCEPTUALISATION OF TOD AS CPR

Transit Oriented Development cannot be treated as a single resource, good or service like many natural resources (e.g. cattle or irrigation water). Instead it is a comprehensive land use and planning strategy with a multidimensional, even fuzzy, character. Based on the notions in chapter 2.1 TOD can be viewed from multiple perspectives:

- Either land use or transport (planning), or the interactions between both
- Scale level, station, corridor, urban-regional network
- Actors: public, private and end-users (also see Appendix I)
- Nature of the resource: physical (e.g. infrastructure, stations, spatial form) or institutional (e.g. property rights, development rights, transport contracts, policy)

Therefore TOD could be understood as a collection of physical and institutional 'resources' that separately may be public, private or club goods, rather than a CPR. What matters in TOD is the cumulative result of the integration of all these 'resources'. Effective implementation of TOD requires a holistic perspective that aligns land use and transport interactions in the urban-regional network in order to create synergies that facilitate a shift of human activity patterns towards public transport (and walking and cycling) (chapter 2.1). The ultimate result is social, economic and environmental sustainability. It is this holistic conception of TOD that is considered the 'resource' of study.

Distinguishing between resource system and resource units

From this vantage point TOD can be defined as a resource *system* that encompasses urban-regional land use and transport interactions. It is collectively 'owned' by a multiplicity of actors that all influence the land use and transport dynamics through their actions, either purposefully (e.g. government investments) or unconsciously (e.g. human behaviour). In CPR terminology these interactions 'provide' the resource *system* and shape the multiple spatial markets in the urban region (chapter 2.1.3). The resource *units* can be thought of as concrete urban developments³ that are derived from the resource *system*. This resource *unit* comprises of three closely interlinked aspects:

1. Demand for urban development that depends on the nature of the spatial markets in the resource *system*.
2. Land use capacity: the allocation of development rights for (potential) urban development to certain locations.
3. Real estate: The physical end-product of urban development which can be used by households and firms by locating there.

Since this research focuses on inter-municipal competition, municipalities are the key 'user' of resource *units*. Municipalities can use their authority over land use (aspect 2) to allocate and restrict land uses at certain

³ This approach puts the land use component of TOD to the forefront. A focus on the transport component is also a viable option. In that case the demand for (public) transportation can be considered as a resource *unit* to transportation provides, the then 'users'.

locations jointly with other municipalities to encourage TOD. At the same time municipalities can employ this very authority to mutually compete for a share of households and businesses (chapter 2.1.5). Hence the implementation of an urban-region wide TOD strategy can be problematic due to the use of the resource *units*.

Characteristics of a Common-pool resource

This definition of TOD as resource furthermore helps to understand how the resource *units* are highly subtractable and how restricting access to the resource is difficult. These characteristics allow TOD to be understood as a CPR.

High subtractability is present in the spatial markets in the urban region (*resource system*). These markets contain a finite 'stock' of demand for urban development (*resource units*). While the 'stock' of demand can replenish slowly over time, depending on the evolving human activity patterns, each resource *unit* used reduces the availability to others. For households and firms require the supply of only one location to be satisfied in their demand (i.e. they settle in one particular municipality).

That does however not exclude the supply of more than one location for each demanded resource *unit*. Despite the spatial heterogeneity of urban regions, there are likely to be numerous competitive locations that can – when development rights are in place – fulfil the demand for urban development (DiPasquale and Wheaton, 1996; McCann, 2013). It is up to the users of the resource, the municipalities in this case, to supply development rights for locations. In the allocation of land use capacity municipalities usually have some discretion within their own jurisdiction. Depending on the institutional context, higher-tier authorities may intervene into the use of the resource *units* by municipalities. This however is no simple feat as it means overruling the autonomy of the municipality concerned. Something that opposes the prevailing proposition in many western countries that autonomy of local authorities leads to superior performance in the public sector (Boyne, 1996; Dollery and Wallis, 2001). Hence exclusion of municipalities may be highly difficult, although not impossible.

Possibility of a tragedy of the commons in TOD

In this conceptualisation of limited availability of urban development (high subtractability) combined with the discretion of municipalities over land use allocation (difficult exclusion) makes that municipalities choose to keep allocating land use capacity in places that counter TOD. For municipalities may correctly understand that if they restrict their land use capacity to locations that suit TOD, other municipalities may not due to geographical competition. These non-compliant municipalities are likely to increase their share of households and businesses, through the more varied supply of location within their jurisdiction (DiPasquale and Wheaton, 1996; McCann, 2013). Moreover they are free-riders among municipalities that comply with TOD. For the improvements in public transport systems also likely benefits non-compliant municipalities in the same region (chapter 2.1.2).

In absence of (adequate) institutional arrangements the only logical outcome can presumably be a tragedy, where human activity patterns in the region do not shift towards public transport, even when every municipality – in principle – aims for it. Without certainty that other municipalities will (sufficiently) commit to TOD, every self-interested, rational municipality can willingly divert from the TOD strategy to avoid losing (or missing out on) a share of households and businesses. In CPR-terminology this entails the 'under-production' of TOD in the resource system caused by an 'over-consumption' of urban developments at non-TOD locations (chapter 2.2.2).

2.3.2. ANALYSING THE MANAGEMENT OF TOD

TOD is obviously no open-access situation void of any institutions or communication between actors. Instead actors interact amidst of a range of intermeshed institutions that exert influence on the coordination of TOD (Hull, 2011). In the CPR-terminology this coordination is the 'management' of the resource TOD, which can be

analysed via the Design Principles (chapter 2.2.4). With the Design Principles it may be possible to identify missing institutions as a source of the hampering implementation of TOD. It may be that the institutional design of regionally coordinated TOD is incomplete or inadequate to oppose the incentive for inter-municipal competition.

Operationalisation of the Design Principles

The description of the Design Principles in chapter 2.2.4 was aimed at CPR in general. In the particular conceptualisation of TOD as a CPR, the Design Principles can be made more specific. An operationalisation of the Design Principles for TOD is shown in table 3. The first Design Principle: Well-defined boundaries for example can be understood as ‘user boundaries’ and ‘resource boundaries’. In the CPR-framework these are translated to a delineation of ‘membership’, ‘location’ the ‘content’ of the TOD strategy. It is certainly not the only way to interpret the Design Principles. It is however a logical interpretation that is based on the collected information and theories in chapter 2.1.

Table 3: The operationalisation of the Design Principles for managing CPR to TOD

DESIGN PRINCIPLE	OPERATIONALISATION FOR ANALYSIS OF TOD
Well-defined boundaries	Delineation of TOD in terms of: <ol style="list-style-type: none"> 1. Membership (Which municipalities participate in TOD and which not?) 2. Location (How is the coordinated area separated from the larger environment?) 3. Content (How is TOD related to and distinguished from other municipal objectives?)
Proportional equivalence between benefits and costs	The distribution of the costs and benefits of TOD: <ol style="list-style-type: none"> 1. Perceived relation between expected benefits / gains and required costs / inputs for municipalities (What do municipalities expected to gain in turn for the inputs/ costs of TOD?) 2. Perceived equity among municipalities (How ‘fair’ do municipalities find the distribution of costs and benefits among each other?)
Collective-choice arrangements	Modification of the coordination (How and when can municipalities influence the rules with regard to the process and content of TOD coordination?)
Monitoring (information)	Availability of information about: <ol style="list-style-type: none"> 1. The demand for urban development (How, when and by whom is the demand for households and firms determined?) 2. The actions of municipalities and their outcomes for TOD (How, when and by whom are the actions of the municipalities monitored?)
Graduated sanctions	Sanctioning of non-compliant municipalities: <ol style="list-style-type: none"> 1. Content (What actions of can be sanctioned?) 2. Process (When, how and by whom can these actions be sanctioned?) 3. Legitimacy (Are sanctions proportional / gradual) 4. Reliability (Are sanctions consistently given?)
Conflict-resolution mechanisms	Conflict-resolution processes (How and by whom can disputes between municipalities be solved?)
Minimal recognition of rights to organize	Degree of recognition of the autonomous position of TOD coordination in the wider institutional context (What leeway do municipalities in the corridor get for creating the institutional arrangements in TOD?) (How easily can municipalities (mis)use other institutions to block TOD coordination?)
Nested enterprises	Support of TOD coordination by other related processes in the wider society (To what extent are the institutional arrangements within a TOD corridor related to and supported by the institutions in other layers of government and the wider society?)

Qualifying the institutional arrangements in TOD

The Design Principles allow the institutional arrangements in TOD to be qualified. A rough measure for appreciating the institutions is to qualify them as 1) missing, 2) present or 3) functioning. When many institutions are missing, the risk on a tragedy in case of a CPR is larger. When functioning institutions are

devised, that becomes less likely (also see chapter 2.2.4) This indicative qualification across the 8 Design Principles allow firstly to identify if CPR-characteristics are present and secondly to identify what particular (categories of) institutions are strong and weak points. For example, when institutions for monitoring (Design Principle 4) are missing, this makes municipalities that do not comply with the coordination of urban development in TOD less visible to other municipalities ('users') or regulating authorities (e.g. higher tier governments). This can induce strategic behaviour of municipalities to divert from coordination themselves and damage inter-actor trust (chapter 2.2.4).

Qualifying the level of implementation of TOD

There are many ways to qualify the implementation of TOD. For the purpose of this research the allocation of land use capacity for households and businesses can be considered the key indicator for implementation. It is via this instrument that the tension between coordination and competition among municipalities is expected to show. Therefore the level of implementation of TOD can be qualified by looking to:

1. The conformity of the allocation of land use capacity at station areas with the inter-municipal agreements for coordination of TOD. This collective development perspective possibly contains a differentiation in size, function and identity of station (as suggested in chapter 2.1.3)
2. The share of land use capacity at station areas relative to the total allocated land use capacity. A relatively higher share will increase the likelihood of denser and more diverse land use at station locations (i.e. increase place value).

The first benchmark gives an idea of the alignment (or discrepancy) between the collective rationality of a group of municipalities and the individual rationality of a single municipality. When the discrepancy between the (implicit) inter-municipal agreements with the outcomes is large, this indicates the collectively irrational outcome that is typical for a CPR. It also provides a starting point for unravelling the individual rationality of municipalities later on. The second benchmark is useful to put the efforts on TOD in perspective. It gives an indication of relative importance of the TOD strategy in the wider institutional context.

2.3.3. CONCEPTUAL MODEL FOR EXPLORING TOD AS CPR

A conceptual model for thesis is presented in figure 10. It contains the definition of TOD in the CPR-framework (inspired by elements from figure 8). It shows how the CONTEXT shapes the potential for urban development through the spatial markets (RESOURCE) and the inter-actor rules and relations (INSTITUTIONS). This defines the setting for the strategy selection process of every single municipality with regard to their authority over land use capacity. The patterns of INTERACTION that thus emerge, result in a certain configuration of land use capacity. These (potential) outcomes (level of IMPLEMENTATION) can comply with or contrast the institutions for TOD coordination as well as co-determine the land use patterns that encourage or counter TOD. This feeds back into the CONTEXT, as the outcomes influence the course of the spatial markets and the perspective on the institutions.

The DESIGN PRINCIPLES for TOD in the upper part of the model forms the analytical perspective to understand to what degree municipalities show fear of rivalry and free-riding behaviour, which is expected in case of a CPR. More precisely, it identifies how institutional arrangements (fail to) create an 'individual rationality' that prevents inter-municipal competition and encourages compliance of municipalities with the collective implementation of TOD. The CPR-framework is a targeted effort to understand the role of geographical competition in the implementation of TOD. It however also has some limitations that are accounted for in chapter 7.2. The way in which the conceptual model is applied in this research is further elaborated in chapter 3.

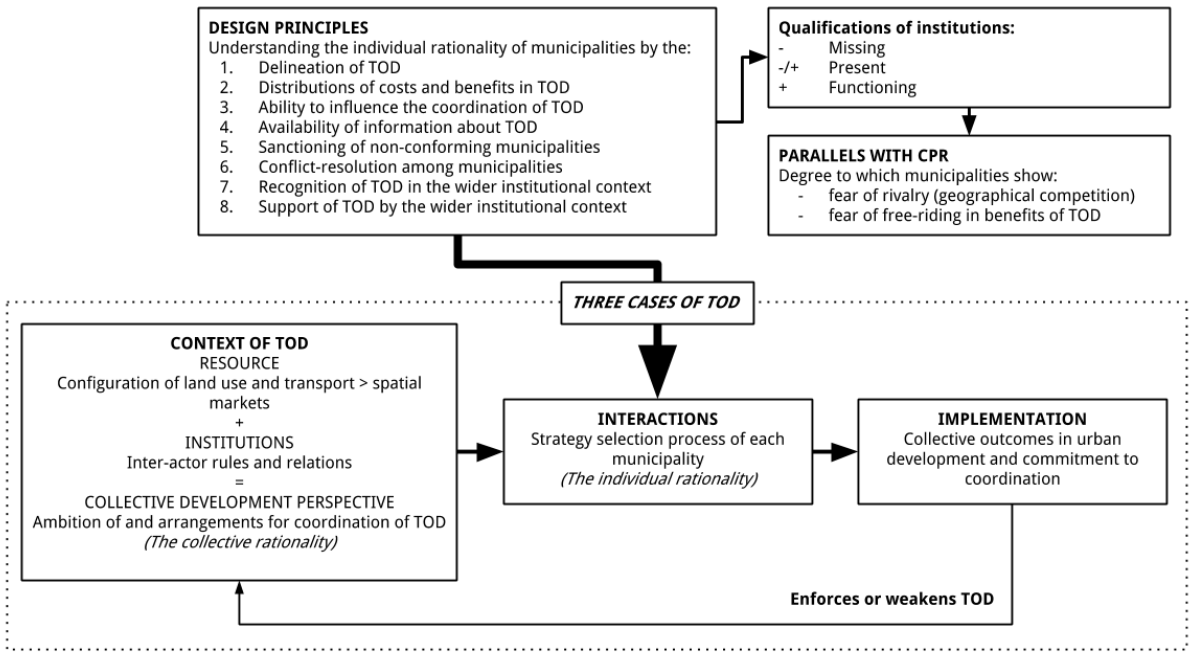


Figure 10: A conceptual model for analysing Transit Oriented Development in the framework of a Common-pool resource.

3. METHODS

This chapter accounts for the methodological choices that are made in this research. Chapter 3.1 outlines the research approach. It forms the underpinning for the selection strategy of the cases in chapter 3.2. In chapter 3.3. the interviews that were conducted and the documentation that was used is accounted for. The way in which this data is processed and analysed in the remainder of this thesis is explained in chapter 3.4.

3.1 RESEARCH APPROACH

In this research the CPR-framework (chapter 2.3) is created because it offers a new comprehensive perspective on the role of geographical competition in the implementation of TOD. This perspective is not comprised by a limited set of clearly defined and quantifiable variables that can be checked across a large number of cases. Therefore an intensive, qualitative research approach is best suited to explore how the assumed tension between coordination and competition (through the use of the Design Principles) holds up and relates to the practice of TOD. By collecting in-depth information about a small number of cases the validity of the CPR-framework can thus be asserted (Clifford et al., 2010; Verschuren and Doorewaard, 2007). The case study method does just that.

In order to gain sufficient detailed and valid data about a limited number of cases, a mix of different research methods is used. This mixed-methods approach is about 'triangulating' different angles and vantage points in order to gain a maximum understanding of the case (Verschuren and Doorewaard, 2007). In other words: *"think small but drill deep, using different methods and drilling from different directions"* (Thomas, 2011, p. 68). In this research triangulation is achieved by combining semi-structured interviews with the analysis of secondary data in the case study (chapter 3.3).

3.2 CASE STUDY

3.2.1 SAMPLING STRATEGY

Due to the research approach, the sampling in this qualitative case study is not aimed at creating representative generalizations about a population that is studied. Instead a strategic selection of cases based on the information content of these cases is used (Verschuren and Doorewaard, 2007; Flyvbjerg, 2001). To test the CPR-framework it seems logical to select cases that are examples of inter-municipal coordination of TOD at the regional (corridor) level. In theory this level seems most promising for creating synergies in land use and transport planning as argued in chapter 2.1.3. The coordination moreover suggests the presence of institutional arrangements between municipalities (and other actors), which is presumed to combat inter-municipal competition (chapter 2.1.5). Within the broad type of regionally coordinated examples of TOD it seems fit to adopt a 'maximum variation' strategy (Flyvbjerg, 2001, p. 79). By deliberately choosing for variety in this category of cases the validity of the CPR-framework can be further tested across various contexts and in different stadia (project-phases). Apart from the creation of a 'maximum variation', the cases themselves are more means for testing the CPR-framework and not targeted for a particular reason.

3.2.2 CASE SELECTION

The sampling strategy resulted in the selection of three cases of TOD (table 4). The first is the Stedenbaan, a TOD programme in the South Wing of the Dutch Randstad that has been running for about 10 years. The second case, the Zaancorridor started only recently and is located in the Province of Noord-Holland, in the Netherlands. The third case, Loop City is situated in Copenhagen, Denmark. In expectation of a future light rail (expected commissioning in 2021) preparatory coordination of land use and transport is being performed. The difference in phasing of these projects is apparent. Among the three, the Danish case is most deviant as it is situated in a different country than the other two, and foresees a new light rail in conjunction with planned

urban regeneration, while the Dutch cases deal with an existing heavy rail infrastructure and more incremental land-use changes in the existing urban areas.

Table 4: Overview the main characteristics of the three selected cases (also see Appendices V-VII)

	STEDENBAAN	ZAANCORRIDOR	LOOP CITY
<i>Origin</i>	Provincial level (2003) Start in 2007	Provincial level (2011) Start in 2014	Local level (2010) Start expected in 2021
<i>Actors involved</i>	1 provincial government 4 regions 32 municipalities 1 transport operator 1 transport infrastructure manager	1 provincial government 10 municipalities 1 transport operator 1 transport infrastructure manager	Central government 1 regional government 11 municipalities 1 transport operator (i.e. owned by actors)
<i>Location</i>	Existing 'heavy rail' trajectory 80 km (Hillegom – Dordrecht Zuid) ⁴	Existing 'heavy rail' trajectory 50 km (Amsterdam Centraal – Heerhugowaard)	Future 'light rail' trajectory 27 km (Ishøj-Lundtofte)
<i>Station areas</i>	32 stations (originally)	13 stations	27 stations
<i>Spatial characteristics</i>	Situated in a large polycentric urban conurbation	Connecting a smaller urban concentration in the north to a urban metropolis in the south	Situated in the suburban area of Copenhagen metropolitan area
<i>Organization of public transport</i>	Concession (private operator)	Concession (private operator)	Public (owned partially by municipalities)

3.3 DATA COLLECTION

The mixed-method approach that is used in the case study exists of two main ingredients: semi-structured interviews (chapter 3.3.1) and desk research for secondary data (chapter 3.3.2). By combining the insights of the participants with the information that is instilled in (written) data a triangulation of sources is achieved. This contributes to the validity of the analysis in chapters 4 and 5. Based on these principles the process for data collection contains 4 general steps:

1. Quick-scan of secondary data related to the concept: This gives a general understanding of the case and its context, which can be used in fine-tuning each semi-structured interview and trace additional documentation.
2. Conducting and transcribing the semi-structured interviews with the involved actors
3. Relating and validating the information retrieved from the interviews to earlier findings.
4. Asking additional input from actors based on the outcomes of the data analysis

The direct input from the actors involved in TOD, gives the most insight in the way they perceive the institutional arrangements that are created. It exposes what considerations municipalities make in using their authority over land use for the implementation of TOD. While secondary data is important in creating an 'objective' image of the choices in the allocation of land use, it can say relatively little about the motives of municipalities and the incentives that are involved.

⁴ Other interpretations of Stedenbaan are possible (chapter 4.1)

3.3.1 INTERVIEWS

For each case the general strategy was to speak to at least one participant at the regional (corridor) level. This is someone that overlooks the TOD concept and thus has a general impression on how municipalities actually act in implementing the concept in their urban development choices. Thus knowledge satisfaction on the regional level. Based on the input given by this interview and the quick scan of the secondary data, a selection of municipalities was made based on peculiarities that came up in the process. In methodological terms this is known as 'snowballing' (Clifford et al., 2010; Verschuren and Doorewaard, 2007). Based on this 10 interviews were arranged with 4 actors at the urban-regional level and 6 municipalities (table 5).

Table 5: Overview of the interviews taken

	CASE	FUNCTION	ORGANIZATION
1	Stedenbaan	Secretary & (program)manager Zuidvleugel	Zuidvleugelbureau (provincial level)
2	Stedenbaan	Program coordinator Stedenbaan	Zuidvleugelbureau (provincial level)
3	Stedenbaan	(Focus group of 3 persons:) - Strategic policy advisor - Policy advisor Mobility - Policy advisor Spatial Development	Gemeente Dordrecht (municipal level)
4	Stedenbaan	Project director, regional spatial development vision	Gemeente Leiden (municipal level)
5	Zaancorridor	Policy advisor nodal development program	Provincie Noord-Holland (provincial level)
6	Zaancorridor	Policy advisor spatial development	Gemeente Uitgeest (municipal level)
7	Zaancorridor	Project manager city development	Gemeente Heerhugowaard (municipal level)
8	Loop City	Project director	Ringbysamarbejdet (urban-regional level)
9	Loop City	City planner (involved in Ringbysamarbejdet)	Hvidovre Kommune (municipal level)
10	Loop City	City planner (involved in Ringbysamarbejdet)	Gladsaxe Kommune (municipal level)

In *Stedenbaan* the municipalities of Dordrecht and Leiden were approached. These are situated at other ends of the corridor in economically and spatially different regions. In Dordrecht the initial ambitions lag behind, whilst Leiden knows much (economic) pressure for urban development. For the *Zaancorridor* Uitgeest (a small municipality at the middle of the corridor) and Heerhugowaard (a larger municipality at the extremity of the corridor) were selected. Suggestions of lacking involvement to the Zaancorridor were crucial for selecting Uitgeest. For Heerhugowaard the opposite was true: much potential for urban development and a pro-active attitude were indicated there. Lastly, in *Loop City*, the municipality of Hvidovre (in the south) and Gladsaxe (in the north) were selected. Hvidovre because it is not situated directly at the light rail, but is still involved in the partnership. In contrast Gladsaxe is a large participant in the partnership with large-scale plans for urban regeneration at the light rail. The deliberate use of 'snowballing' was thus used to increase the variety (seek contrasts) in the cases.

The semi-structured interviews are performed at by means of an interview guide (Appendix III). The interview guide contains a number of questions and probes that are related to the operationalisation of the Design Principles in chapter 2.3.2 (table 3). For goals for each of these questions are stated in the interview guide. In the actual interviews (Appendix IIV), the interview guide was adopted to encompass earlier specific finding (the results of snowballing). Important is that municipalities were encouraged to come up with the geographical competition in TOD themselves. Priming or suggestive questions were avoided at much as possible.

3.3.2 SECONDARY DATA

The goal of secondary data is twofold. It first of all serves to explore the cases of TOD and understand its mechanisms and context. Secondly it can be used in conjunction with the data retrieved from the semi-structured interviews. It can support (or oppose) findings in the interviews and lead to a more solid image of the actual implementation of TOD by municipal actors. The secondary data is comprised of all kinds of documentation. Most of it is made up by policy documents, monitors and underlying research reports of various authorities in the region, but news items, agreements, articles, etc. are also sometimes used. A full overview of all secondary data is given in Appendix IV. For each source the name of the actor, the year, the original document name and the type of document is listed.

3.4 DATA PROCESSING

3.4.1 THE ANALYSIS OF DATA

The interviews and secondary data are analysed according to the Design Principles in chapter 2.3.2 (table 2). Examples for the way in which the association of data with the Design principles is made are given in table 6 (for interviews) and table 7 (for secondary data).

Table 6: An example for the coding of the interview transcripts

DESIGN PRINCIPLE	EXCERPT FROM INTERVIEW (Translation from Dutch)
<i>Proportional equivalence between benefits and costs</i>	<p><i>When I look at some numbers in circulation, it can be seen that throughout Stedenbaan, but also in and around Leiden there is a significant vacancy rate of about 15%. At the same time I see a future capacity in plans of about 243,000 m2 and a demand of 100 000 m2 to 2030. What is there to say about that?</i></p> <p>There is a lot to say about it. You know, it is extremely complicated. On the one hand everyone sees that there is overcapacity in the market. Everyone also understands that you should actually take capacity out of the market. This is possible by restructuring, but that seems insufficient. This means that you'll have to take 'hard' plan capacity from the market. That sounds nice, but it very complicated in practice, because someone has to take the loss. These may be individuals, but it can also be the government. There is quite a number of municipalities with land positions in which they have invested. These municipalities will then get financially stuck. At the same time we see that a number of sites is likely to be very difficult to develop in future. We also see that - what Leiden concerned - the station area is the most suitable location. We are going to bring the first stage in development. If all goes well new office development starts in the coming year. What avenges itself in this region - a region with a lot of municipalities, one large, one smaller and lots of little ones around it - is a discussion on the course of office development - where and where not - is very difficult to perform because there is always someone who has to take his loss. That has not been resolved yet. Work is being done on a regional strategy for offices. Actually a revision of the offices strategy we had before. Which is not finished yet. And so I do not know what it will result in. So I don't know yet where capacity will be deleted. I do not even know whether we are going resolve it at all together. I know that we are conducting a conversation with each other. Now also with the province. The province eventually has the power to designate areas. I do not know if they want to do it and whether they eventually dare (Traudes, 2015).</p>
<i>Collective choice arrangements</i>	
<i>Graduated Sanctions</i>	

This excerpt from the transcript displays how the secondary data⁵ is used as input for the interview with Traudes (2015). Without being suggestive (or as little as possible) its specific formulation triggers an in-depth reaction.

⁵ The secondary data that was used to formulate this question for instance includes the *Feitenblad kantoren Holland Rijnland*, *Kantorenstrategie Holland Rijnland* and *Verordening Ruimte* (see Appendix IV).

Table 7: An example for the coding of the secondary data

DESIGN PRINCIPLE	EXCERPT FROM SECONDARY DATA(Translation from Danish)
<i>Cost-benefits</i>	The vision includes proposals for local development programs for 10 urban areas along the light rail. Some municipalities state that the proposed development will be up for adoption directly as concepts for their further planning work, while others of identity formulas are not considered directly applicable (Ringby- Letbanesamarbejdet, 2011, p. 9)
<i>Monitoring (outcomes)</i>	Compared to the potential for future population and economic development, it is estimated that Loop City as a whole has an excess of urban transformation to commercial buildings rather than homes (Ringbysamarbejdet, 2014, p. 9-10) The activities on the construction project area (the total number of building projects) are relatively uniform across municipalities, when demographics are taken into account. (Ringbysamarbejdet, 2014, p. 39)

Table 7 contains an example of some key passages in two of the analysed documents and how these can relate to the Design Principles.

3.4.2 STRUCTURE OF THE CASES

The findings are processed in a case description for each case (4.1 – 4.3) and compared in chapter 5. The cases are written in structure that strongly relates to the component of the conceptual model in chapter 2.3:

1. Introduction: an overview of the nature and CONTEXT⁶ of the coordination
2. COLLECTIVE DEVELOPMENT PERSPECTIVE: the ambitions of coordination
3. DESIGN PRINCIPLES: an assessment of the institutional arrangements for INTERACTIONS in coordination
4. IMPLEMENTATION: an evaluation of the (potential) outcomes of coordination

This findings presented in chapter 4 are based on a detailed assessment of each case in the Appendices V-VII. In that assessment the following elements where analysed:

- a. Introduction (*context*): essence of the TOD concept, spatial context of the wider region, description of the corridor, general institutional context (planning and government), process and organization of the concept
- b. Development perspective (*collective rationality*): ambitions on a conceptual level, (assessment of spatial developments in the TOD concept, concrete (shared and agreed) ambitions
- c. Implementation (the collective results of the *individual rationality*): (ex-ante) evaluation of municipal choices, perspective of regional / provincial actor on municipal choices, rationality of municipalities for making choices

⁶ These capitalized words directly refer to the conceptual model

4. CASE STUDY

In this chapter the three cases of regionally coordinated TOD are described conform the structure provided in chapter 3.4.2. The first case, *Stedenbaan* is represented in chapter 4.1 and supplemented by Appendix V. This is followed by the Zaancorridor in chapter 4.2 (supplemented by Appendix VI) and Loop City in chapter 4.3 (supplemented by Appendix VII).

4.1 STEDENBAAN

This chapter concerns the longest ongoing and most extensive effort on TOD coordination in the Netherlands. By means of the Design Principles the institutions for the implementation of *Stedenbaan* are analysed. Further details about the context of *Stedenbaan* as well as an in-depth assessment of the general-local implementation are provided in Appendix V.

4.1.1 INTRODUCTION

Transit Oriented Development in the South Wing of the Dutch *Randstad* conurbation is performed under the banner of the *Stedenbaan*, which translates to 'City Line'. Since 2007 a number of (semi)governmental authorities⁷ committed themselves to the ambition to create a high-frequency, metro-like public transport service on the existing national rail network in conjunction with the establishing a regionally coordinated urbanization program based on the development in the stations areas along the rail network (Atelier Zuidvleugel, 2006; Bestuurlijk Platform Zuidvleugel, 2007).

The focus in *Stedenbaan* lies on the *Oude Lijn* ('Old Line'), which forms the main railway corridor through the main urban areas, in the South Wing (figure 11). Under the provision that the urbanization program creates sufficient travellers, NS (Dutch Railways) will from 2020 provide every station with a 10 minute connection in both directions (Samenwerkende Partners in *Stedenbaan*, 2014).

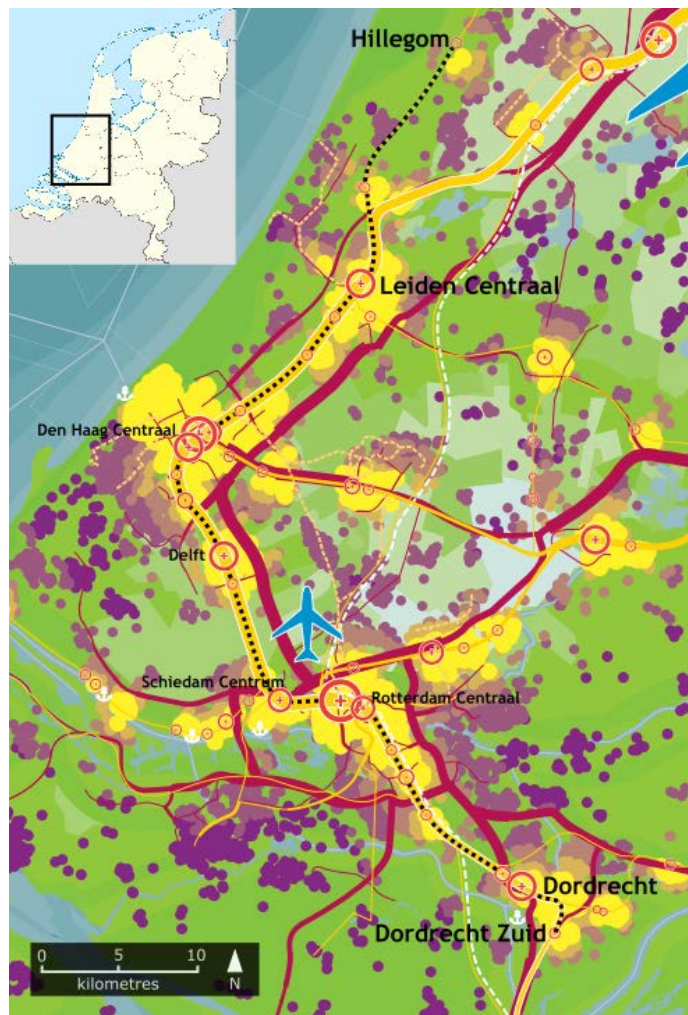


Figure 11: The trajectory of the Oude Lijn (dotted line) in the South Wing of the Netherlands (Author, 2015)

⁷ Province of Zuid-Holland, municipalities Rotterdam and The Hague, Metropoolregio Rotterdam Den Haag, Regions Holland Rijnland, Midden Holland and Drechtsteden, NS (service operator), ProRail (manager of the national rail infrastructure) (Samenwerkende Partners in *Stedenbaan*, 2014).

4.1.2 COLLECTIVE DEVELOPMENT PERSPECTIVE

Original ambition

Two surveys to public transportation and the quantitatively feasible, promising and desirable urban developments in the South Wing formed the basis for Stedenbaan (Atelier Zuidvleugel, 2006). The governments in the South Wing (so without NS and ProRail) committed themselves via a declaration of intent to a quantitative spatial program and some additional qualitative agreements that both were to be elaborated by the regions themselves (Bestuurlijk Platform Zuidvleugel, 2007).

The ambition for the period 2010 to 2020 is a net addition of 25.000 to 40.000 new homes and 0.7 to 1.2 million m² gross floor area of office space within the 1200 metre zone around the stations within the Stedenbaan. This comes down to 1/3 of the estimated demand for housing and 2/3 of the demand for offices (Bestuurlijk Platform Zuidvleugel, 2007). In addition to that regional facilities were to be located as much as possible nearby stations. Stations should furthermore be better accessible by increasing the bicycle storage and parking space with 50%. Based on the surveys functional differentiation among stations was encouraged, based on station profiles, typologies and lifestyles (e.g. Boelens et al., 2005).

Quantitative implementation

Since 2007 the progress of Stedenbaan is monitored on a yearly basis (Appendix V). A good general impression of the implementation of Stedenbaan can be obtained by putting together the projected spatial program for housing and offices each year⁸. The overview that is thus generated shows how both the projected amount of homes (figure 12) and office floorspace (figure 13) grows in 2008 and 2009, before steadily declining in the following years. In the latest monitor the realized and projected spatial program for both housing and offices is approaching the minimal targets of the 2007 ambition.

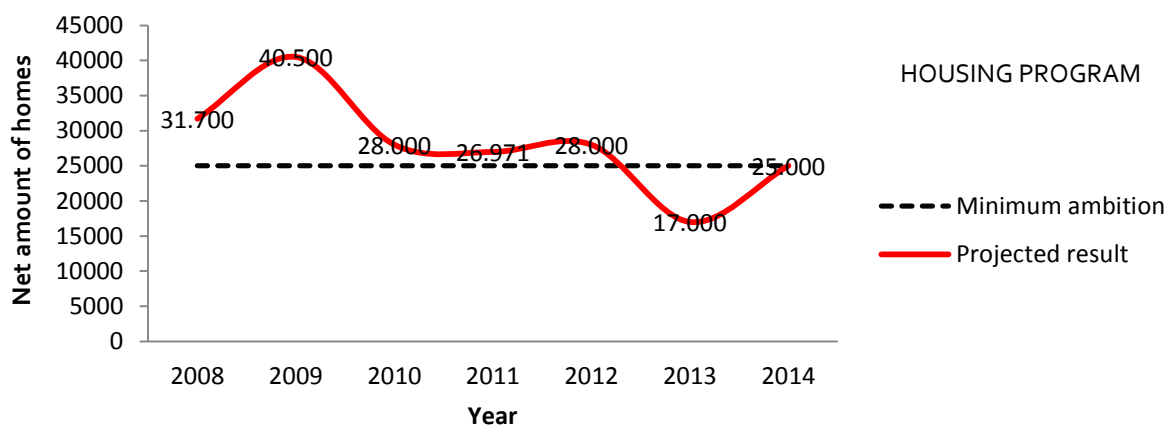


Figure 12: Overview of the subsequent monitors on the estimated housing program at Stedenbaanlocations by 2020 (Author, 2015)

The urban developments are not only showing a declining trend in absolute terms, but also relative to the entire (projected) spatial program in the South Wing. The relative share of projected offices at Stedenbaanstations shifted from 61% of the total capacity to only 50% between 2012 and 2013. That is far below the ambition of locating two-thirds of the new offices within Stedenbaan. A similar trend is visible in

⁸ The projected housing program for 2020 is determined by adding the estimated program for the available land use capacity to the already realized housing program, corrected for demolition of existing homes. For office floor space no correction for transformation of demolition was applied.

housing. Instead of one-third, only 22 percent of the realized and projected housing program is situated at Stedenbaanstations (Samenwerkende Partners in Stedenbaan, 2014).

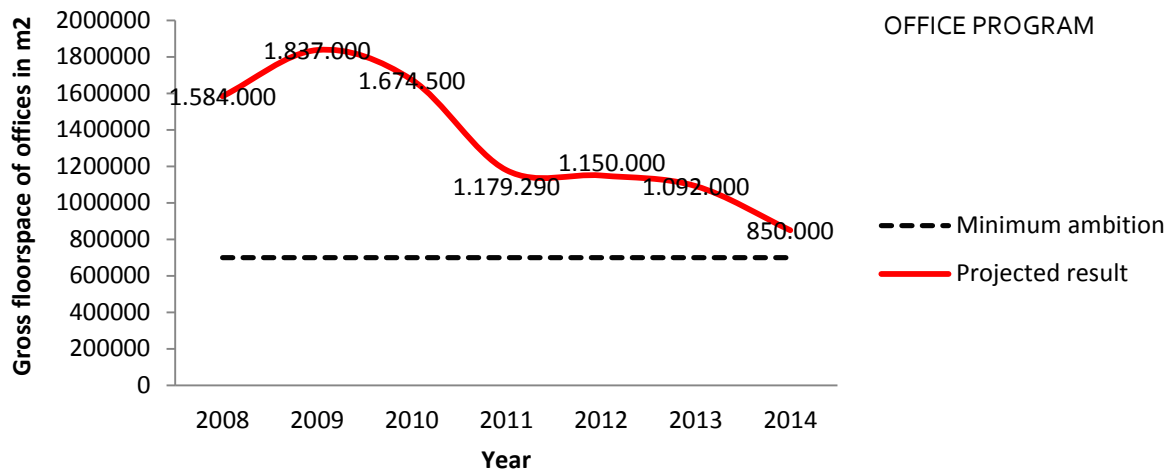


Figure 13: Overview of the subsequent monitors on the estimated office program at Stedenbaanlocations by 2020 (Author, 2015)

These tendencies can be ascribed to the fact that the (projected) land use capacity at Stedenbaanlocation is less certain in nature than in other locations. The housing capacity in land use plans in the province of Zuid-Holland is relatively fixed (64%) in many locations outside the urban growth boundaries (BSD). Within the BSD (among which all Stedenbaanlocations) a mere 41% is fixed (Vereniging Deltametropool, 2014). For offices the same trend shows. Of the land use capacity for offices at locations outside of the influence sphere of Stedenbaan – which is about half of the total capacity – roughly 70-80% of the capacity is fixed in valid land use plans (Van de Walle, 2015).

Qualitative implementation

Implementation of the non-quantified goals of the 2007 ambition into additional regional agreements has not taken place (Appendix V). Despite regular calls for further diversification of the Stedenbaanstations in multiple monitors, no deliberate functional differentiation of station has been performed within or among regions (Bestuurlijk Platform Stedenbaan, 2009; Van de Walle, 2015). It is really the autonomous growth of travellers at the Oude Lijn – not the spatial program – that makes the targets for the NS business case feasible, albeit barely (figure 14).

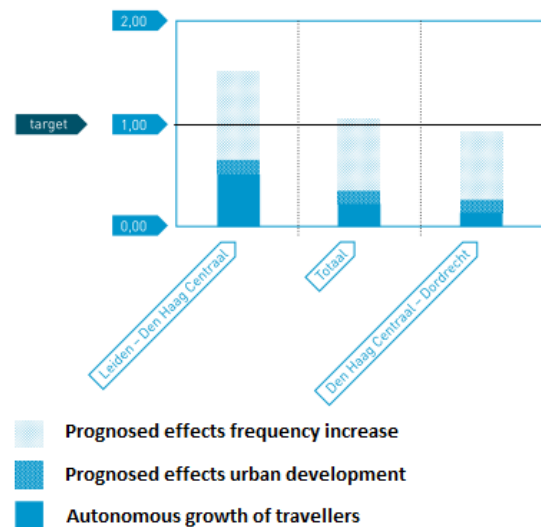


Figure 14: Businesscase for the 'Oude Lijn', prognosis 2020 (Samenwerkende Partners in Stedenbaan, 2014).

4.1.3 INTERACTIONS IN STEDENBAAN PERCEIVED VIA THE DESIGN PRINCIPLES

The hampering implementation of Stedenbaan can be attributed to many general and specific causes. Appendix V contains an in-depth analysis of the implementation as perceived from the overall viewpoint of the South Wing, Dordrecht municipality (Region Drechtsteden) and Leiden municipality (Region Holland Rijnland). Based on these detailed results the Design Principles are used here to analyse the implementation of Stedenbaan in more general terms.

Well-defined boundaries

The precise meaning and form of Stedenbaan fluctuated through time. In 2007 it was a strategy that aimed for urbanization nearby the national railway network. With StedenbaanPlus in 2011 the strategy was expanded to incorporate all public transport modalities. Something that was reversed in 2014 because the *"scope [of Stedenbaan] became too big and the focus was reduced"* (Dobbe, 2015). The autonomous growth of the Oude Lijn in a period of economic recession made attention shift to generating travellers at stations by other means than the spatial program. Currently much emphasis is given to the integration of different modalities for travel and related aspects such as the quality of the station area, good 'wayfinding' and facilities for car and bike. Therefore those involved refer to Stedenbaan as a 'brand' or 'philosophy' in the planning context of the province rather than a strict set of agreements from 2007 (Dobbe, 2015; Van de Walle, 2015).

The South Wing forms the geographical boundary of Stedenbaan. This delineation is derived from the administrative boundaries of the province of Zuid-Holland and its subunits: 4 regions and 32 municipalities, which can be considered as the 'users' in Stedenbaan. They are however not all in the same league as is shown by the narrow, but arguably justified interpretation in which the business case for the 'Oude Lijn' corridor forms the centrepiece of the Stedenbaan. Far from all the 32 municipalities are located at that corridor, even though they all influence the implementation of the spatial program. This because the coordination of Stedenbaan is an integral part of the housing and office programs (policies), which affect the distribution of land use capacity in the entire region (see Appendix V). It is consequently difficult to qualify the legitimate 'users' (as well as 'providers' of TOD) among the municipalities in Stedenbaan.

The geographical boundaries to the Stedenbaan are moreover diffuse due to the spatial markets, which are fragmented and do not align with the administrative borders. The regions are – broadly speaking – congruent with the scale at which the housing markets function (Van der Hout et al., 2015). The market for businesses (offices) however operates at somewhat higher scale level (Appendix V). A delineation of Stedenbaan based on provincial borders creates the situation in which Leiden (region Holland Rijnland) and Dordrecht (region Drechtsteden) seem 'appendixes' of the core region Rotterdam The Hague. This is a limited view on the dynamics in the market for firms, as Dordrecht competes with Rotterdam and Breda for (maritime) businesses (Van der Hout et al., 2015) and Leiden competes with Amsterdam on knowledge-intensive businesses (Traudes, 2015). The demand for urban development (making up the resource *unit*) is consequently not limited to those municipalities directly at the Oude Lijn corridor, nor can be kept exclusive within provincial or regional borders.

Proportional equivalence between benefits and costs

Both Dordrecht and Leiden and their respective regions indicate that the benefits of multimodal accessibility and densification that comes with Stedenbaan are well understood and valued. (Traudes, 2015; Van der Hout et al., 2015). This is something that is echoed in the South Wing policies, where Stedenbaan is propagated as key in achieving sustainability and economic competitiveness (Appendix V).

At the same time the costs of Stedenbaan are significant to individual municipalities. It requires the allocation and restriction of land use to certain locations. This process highly affects the financial-economic interests of individual municipalities. The results in Appendix V indicate that geographical competition between municipalities shows in the South Wing, especially when it comes to the fear of missing out on businesses. This makes municipalities (and regions) deliberately keep open highway business locations even if this opposes the success of Stedenbaan. Van der Hout et al. (2015) explain *"Look, if this region [Drechtsteden] does not offer directly available office plots and Rotterdam does, then there is a certain market from within the region that will not settle here because the supply is not present"*. Similar processes go on in region Holland Rijnland (Traudes, 2015). To a lesser degree this also applies to the allocation of housing capacity. It is not a viable option for municipalities to refrain from creating land use capacity for housing outside of Stedenbaan locations. (Population) growth is the only business model for municipalities in the Netherlands. There is no equalization mechanism that compensates 'altruistic' municipalities for the missed financial benefits (e.g. growth equals

more national funding and more property tax) (Dobbe, 2015). Like Van der Hout et al. (2015) state: "*At South Wing level everybody in the end just wants to make money. A part of the municipalities floats on this. We too. So it [equalization] is possible in theory, but it really won't just happen*".

Additional costs and efforts for Stedenbaan follow from the lingering effects of former governance. Civil servants, politicians and other actors in the South Wing are stuck in the VINEX-driven urbanization strategies of the past that encouraged urban development at the edges of cities (Van der Walle, 2015). It created a development model in which municipalities (among other investors) invested in land holding at greenfield locations. The anticipated profits derived from the actual development were used by municipalities to supplement their income. Due to the economic recession, changing preferences of consumers and new policy insights, these greenfield locations are (largely) redundant (e.g. Samenwerkingsverband Zuidvleugel, 2014). Still municipalities (and other actors) cling on to the outdated urbanization agreements, only continue with this 'old governance'. Partly out of habit, but partly also out of the wish and necessity to retrieve some of the investments made in these locations (Traudes, 2015; Van de Walle, 2015).

While it is common knowledge that Stedenbaan requires reduction of certain (types) of land use capacity in favour of other types of locations, no one wants to take the losses (Traudes, 2015). For the municipality that moves first does not only takes direct financial losses, but also reduces the (over)capacity in the wider region, thereby giving its neighbouring municipalities a competitive edge (over attaining urban development) if they don't take equal losses. The absence of a fair and proportional cost-benefit division creates a lot of reluctance for among regions and municipalities to commit to the coordination in Stedenbaan (Van der Hout et al., 2015; Van de Walle, 2015). Dobbe (2015) classifies it as 'distributive justice' in the South Wing, in which authorities within regions deliberately refrain from making 'clear choices' in order to accommodate the interests of all, thereby accepting that the long-term collective benefits of Stedenbaan may not emerge.

Collective choice arrangements

The direct influence of municipalities is largely limited to the own region. Within the preconditions set on South Wing level the regions have some level of discretion to devise rules, further refine coordination of Stedenbaan and relate it to other relevant policy issues. Via indirect regional representation municipalities can influence the institutional arrangements for Stedenbaan at South Wing level. This principle has worked well in the past due to the 'span of control' it gave to the creation of Stedenbaan (e.g. one contact for NS and ProRail), but is slowly evolving towards a more 'fluid' collaboration in occasional networks of partners (i.e. coalition of the 'willing') (Van de Walle, 2015). The large municipalities Rotterdam and The Hague have however always had a direct representation at South Wing level, in addition to their (indirect) regional representation via the recently formed *Metropoolregio Rotterdam The Hague*. The economic weight of these two largest cities in the South Wing makes that they directly partake with the province of Zuid-Holland in the most important national political-administrative discussions (i.e. discussion on national railway, national funding via MIRT-program) that affect Stedenbaan. While there is certain logic to it, this creates an asymmetry in representative power that Leiden and Dordrecht in particular perceive as a threat to their own positions and interests (Van der Hout, 2015). As Traudes (2015) explains: "*Look The Hague and Rotterdam are very strong. (...) They give little heed to the province [Zuid-Holland]. They have a very independent position*". This pushes the other regions to create a counterweight by means of a univocal regional development strategy. The other side of the coin is that it can damage the willingness to commit to collaboration on South Wing level.

Monitoring

Monitoring was a part of Stedenbaan from the very start. The yearly *Stedenbaanmonitor* attempts to bundle all kinds of available information into a coherent overview on the state of affairs concerning the ambitions of Stedenbaan from 2007. The monitoring system does not track the actions of individual municipalities as such, but instead uses the granularity of regions and the South Wing in its entirety. Like with coordination, the monitoring on municipal level is considered an internal business of regions. Monitoring in the Stedenbaan has

been simplified somewhat in recent times, as detailed figures can give a false sense of security about highly uncertain issues according to Van de Walle (2015).

The assessment of demand for urban development is performed largely separately from Stedenbaan via an intricate process. It is headed by the province, which performs an assessment of housing demand and ascribes each region with a certain indicative housing program (Provincie Zuid Holland, 2014a). Within a certain bandwidth regions have the leeway to create their own housing policy and take all kinds of interests (among which Stedenbaan) into consideration. For offices (and other commercial functions) similar separate trajectories exist within the South Wing (even related to the national level). In these assessments it remains notoriously hard to give a prognosis of the quantitative and especially the qualitative demand. Typologies, lifestyles and other categorizations are used, but the spatial markets remain highly unpredictable (Dobbe, 2015). This tradition of higher level authorities that assign a certain program to lower governments has created many outdated expectations and is riddled with 'old' informal agreements among authorities (see Appendix V).

Graduated sanctioning

The challenge of monitoring complicates exposing non-conforming municipalities. There is hardly direct sanctioning taking place in Stedenbaan. Sanctioning is no part of the monitor, as the institutional arrangements are based on informal sanctioning in political discussion platform on region level. The monitor however does give input for partaking actors to hold each other accountable, but does not openly display the actions of individual municipalities. The conversations about accountability are highly relational, based on the responsibilities and reputation of partaking actors (Dobbe, 2015; Van de Walle, 2015). 'Hard' sanctioning instruments are not available at the regional level. The 'sting' in sanctioning is provided by the province via their spatial regulation. There the province has a number of instruments to overrule municipalities and regions in the allocation of land use capacity. All are based on the Urbanization Ladder (*Ladder Duurzame Verstedelijking*) that requires municipalities to consider existing locations within the urban growth boundaries (BSD) and actual regional demand, before greenfield development is allowed (Provincie Zuid-Holland, 2014b; 2014c). Especially the strict assignment of 'preference locations' for offices – in theory – poses a powerful instrument forcing prioritization of office capacity within regions. The instrument is however imperfect and subject to political pressure and old agreements making that it is far from strictly enforced (Appendix V). The fallibility of the province and reluctance to make use of enforcement presumably undermine the commitment of municipalities to the agreements about coordination of TOD.

Conflict resolution mechanisms

There are within Stedenbaan no specially created arrangements for formal conflict-resolution. The regular procedures in national legislation can be used to fall back on, when informal conflict-resolution fails. This can result in time-consuming procedural wrangling that does not justify the actual discussion (Dobbe, 2015). More often informal administrative-political trajectories are followed within and among regions. The rough choices in limiting or reducing land use capacity that are required to implement TOD, are difficult to make negotiable. The Stedenbaan is marked by highly volatile interrelationships that are subject to political quarrels (Van de Walle, 2015). There is an example in Drechtsteden, where the municipalities after much discussion decided to cancel and share the costs of Noordoevers, a planned large scale development of the municipalities of Hendrik-Ido-Ambacht. This instance of equalization proved difficult to organize among 6 municipalities, something that is deemed sheer impossible in bigger regions such as Holland Rijnland (14 municipalities) let alone the whole South Wing (Traudes, 2015; Van der Hout et al., 2015).

Minimal recognition of rights to organize

Stedenbaan as a strategy and 'brand' is embedded in much of the policies and ways of conduct within the South Wing (Appendix V). It is acknowledged by many layers of governments and has a relatively autonomous position (Van de Walle, 2015). Municipalities cannot easily neglect or directly oppose Stedenbaan. At the same time there is a lot of discretion for municipalities to use Stedenbaan flexibly. The 'old governance' in the

urbanization agreements or otherwise created expectations from the past, still can be employed to evade or bend Stedenbaan in particular situations. While the right to make use of the regular legislation and formal procedures cannot be excluded from the municipalities, Stedenbaans embeddedness in policy makes it a factor that is kept into account by higher-tier authorities and in court.

Nested Enterprises

The structure of Stedenbaan is a textbook example of polycentricism. Authorities in each of the three levels (province, region and municipality) relate to each other, but also have certain independence. On paper this should allow municipalities in regions to effectively implement Stedenbaan in a way that suits the regional context, whilst still benefitting from some centrality (e.g. joint representation to national actors, central monitoring, sharing experiences and knowledge) (Van de Walle, 2015). Indeed many institutions are established, but lack a visible connection with the municipal level, preventing the idealized structure from functioning optimally. Additional factors that fundamentally influence the stability of Stedenbaan can be found in the volatile administrative context of Stedenbaan. The South Wing, which like Stedenbaan is no legal entity in itself, is currently under discussion due to the abolishment of the WGR+regions (a type formal regional authority) and disagreement about the establishment of transport regions (*vervoersregio's*) (Dobbe, 2015). Another issue is the centralistic structure of the public transport sector, which can directly impact the 'business case' of NS. In the worst-case scenario public transport is not being improved as the NS can still opt-out. This key element in implementing Stedenbaan in the South Wing cannot be controlled by the authorities involved (Samenwerkende Partners in Stedenbaan, 2014; Van de Walle, 2015).

4.1.4 IMPLEMENTATION OF STEDENBAAN

The analysis of Stedenbaan via the CPR-framework made clear how the institutional arrangements in the South Wing fail to make effective implementation of TOD happen. The core of the problem is that the incentives for municipalities to comply with Stedenbaan are not strong enough to counter the incentives to compete for urban development at all (including non-station) locations. As long as monitoring remains imprecise and sanctioning is not reliable, the danger of over-consumption of land use capacity in general remains present. Greenfield development may prevail (see chapter 4.1.2) and can result in an under-production of TOD-oriented development patterns on the long run. The remnant of the 'old governance' in the South Wing (both financially as habitual) exacerbates the situation and contributes to an atmosphere in which non-conforming behaviour is tolerated among municipalities and by the province up to a certain point. This has to do with the unique position of each municipality (user). All face slightly different past agreements, different positions with regard to the corridor and different functioning spatial markets. This makes that every municipality will make a different cost-benefit judgement too. This heterogeneity in the use (type of urban development versus demand) and the users (municipalities) makes the creation of a 'proportional' distribution of land use highly complicated. The polycentric structure of Stedenbaan should in principle ease this, but requires more commitment among the municipalities within regions to create additional institutions. As of yet, municipalities seem to collectively choose to externalize the costs (missed benefits) of hampering implementation of Stedenbaan in time and place. The spatial development patterns that are developing within the regions are likely inferior for the long-term spatial-economic development of the South Wing as internationally competing metropolitan area.

4.2 ZAANCORRIDOR

In this chapter a relatively new Dutch concept for regional coordination of TOD is contrasted with the actual perspective of the partaking local authorities (for a detailed assessment see Appendix VI). The institutions for (future) implementation of the Zaanccorridor are analysed by means of the Design principles to see to what extent CPR characteristics show.

4.2.1 INTRODUCTION

Via the slogan *Maak Plaats!*, literally 'make space', the way should be paved for Transit Oriented Development in the Dutch province of Noord-Holland. The slogan refers to a 'smart growth strategy' that focuses on the better utilization of the existing urban and infrastructural network in the province. Improvements to the public transportation system are pursued by prioritization of urban development inside urban growth boundaries (BBG) and in the vicinity of multimodal accessible stations (Vereniging Deltametropool & Provincie Noord-Holland, 2013). The province, as initiator of *Maak Plaats!*, does not consider it direct policy. It is rather marked as guideline and starting point for future policy, not in the last place because of its elaborate survey of the opportunities of TOD in Noord-Holland (Chorus, 2015).

Within *Maak Plaats!*, the Zaanccorridor is marked as pilot project for corridor-based coordination by a number of (semi-)governmental partners⁹. The Zaanccorridor is one of the 8 regional corridors in Noord-Holland and identified by the province to have much potential for aligning urban development. It connects the peripheral northern parts of the province by rail to the vast metropolitan area of Amsterdam in the south (figure 15). Under the provision that the coordination of urban development generates sufficient travellers, NS (Dutch Railways) will at approximately 2028 provide each station at the Zaanccorridor with a train service in each direction every 10 minutes (Provincie Noord-Holland, 2014a).

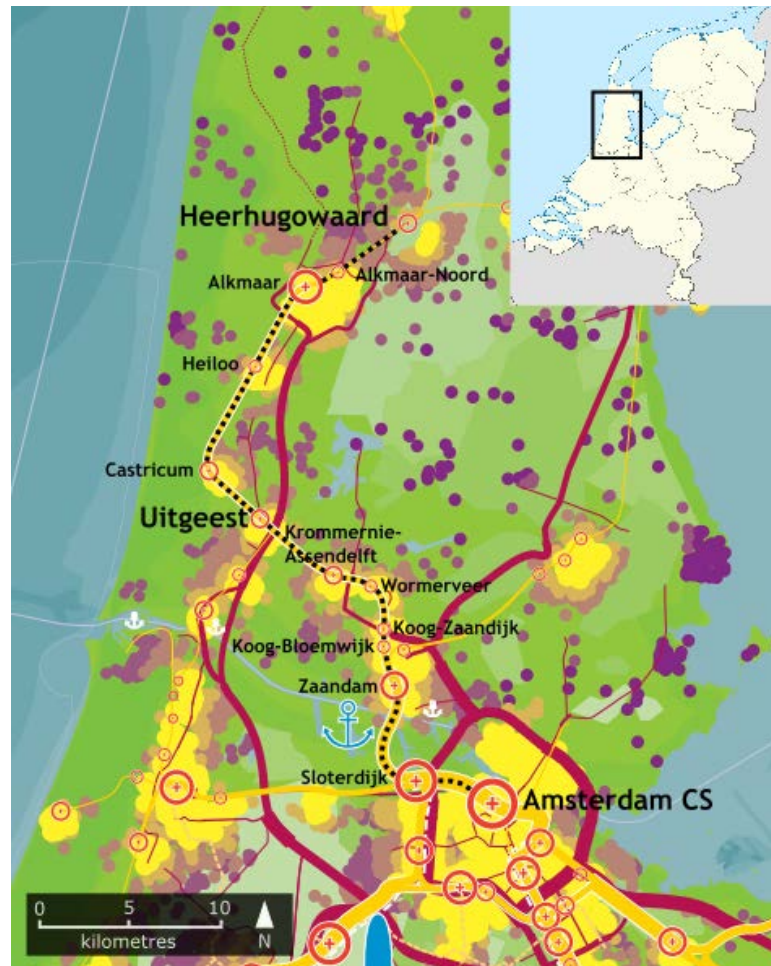


Figure 15: The trajectory of the Zaanccorridor (dotted line) in the province of Noord-Holland (Author, 2015)

⁹ Provincie Noord-Holland, municipalities Alkmaar, Castricum, Heerhugowaard, Heiloo, Uitgeest, Zaanstad, NS (service operator), ProRail (manager of the national railinfrastructure)(Provincie Noord-Holland, 2014)

4.2.2 THE COLLECTIVE DEVELOPMENT PERSPECTIVE

The Maak Plaats! survey

Based on the strategic principles of Maak Plaats, the potential for improvements of station areas in terms of public transportation and urban development were indicated in a survey¹⁰. It showed the theoretical potential of a corridor-based differentiation of urban development for improving the feasibility of high-frequent public transport (also see chapter 2.1.3). Almost 50% of the housing demand up to 2040 can be in theory realized within the current land use capacity at stations in the Zaancorridor. That is if land use plans for housing are revised and aligned with the qualitative distribution as proposed in the assessment (Vereniging Deltametropool & Provincie Noord-Holland, 2013)

Shared intentions

The scenario served as inspiration for the adoption of the Zaancorridor by the municipalities, province and transport sector. In general terms the partners agreed to seek the most optimal urban development at stations within the Zaancorridor to create the travel demand that is needed for the improvements in public transport. This commitment is not based on any legal obligation, but the intention to conform to the 10 principles of the Maak Plaats! strategy (Provincie Noord-Holland, 2014a). When municipalities abide, this means that the inter-municipal alignment of spatial program should facilitate approximately 16.800 homes (50% of the estimated demand for the Zaancorridor) within the 1200 metre catchment area of stations by 2040. This implies prioritization of land use capacity for housing at station locations within the urban growth boundaries (BBG) and restriction of land use capacity elsewhere. The same goes for regional facilities and offices, which are to be concentrated at multimodal accessible stations. For offices this mostly means reduction of vacant offices elsewhere, rather than much new development at stations. In support of the urban development station areas should facilitate a smooth transfer between modes of transport and act as 'gateways' to the city or countryside (Vereniging Deltametropool & Provincie Noord-Holland, 2013)

4.2.3 INTERACTIONS IN THE ZAANCORRIDOR PERCEIVED VIA THE DESIGN PRINCIPLES

The Design principles are used to show the (potential for) implementation of the Zaancorridor by municipalities in the current institutional context. This analysis is based on the in-depth analysis of the specific position of the province of Noord-Holland and the municipalities of Heerhugowaard and Uitgeest in Appendix VI.

Well-defined boundaries

As a strategy the Zaancorridor is principally about the coordination of a differentiated housing program. Businesses and facilities are considered too, but play a minor role. The 'branding' of the corridor for tourists, the creation of culture and place-identities are lines of thinking for a functional differentiation of the Zaancorridor that exceeds strict differentiation based on land use capacity for urban development (Chorus, 2015). It is not yet clear to what extent these different elements will be incorporated into a regional alignment program.

Geographically the Zaancorridor is clearly demarcated as the railway track between Heerhugowaard and Amsterdam Centraal, which comprises in total of 13 stations and corresponding catchment areas. This delineation based on the urban regions of Alkmaar and Amsterdam at both ends of the trajectory is logical from a transportation perspective, as it creates the potential for bi-directional travel in-between. The end-

¹⁰ An overview of the steps taken in the survey can be found in Appendix V. For detailed data, formulas and underlying assumptions see Provincie Noord-Holland & Vereniging Deltametropool (2013).

stations of the Zaancorridor seem somewhat arbitrary, but are arguably logical in consideration of the PHS¹¹. Amsterdam Centraal aligns with the PHS trajectory. And while Heerhugowaard is formally no part of the trajectory, it relates to it by providing a terrain for the alignment of trains that is required to run the PHS service (Rentinck, 2015).

Membership in the Zaancorridor naturally lies with the 7 municipalities that have one or more stations at the trajectory. Of these municipalities 6 of out 7 signed the declaration of intent. The municipality of Amsterdam did not commit to the Zaancorridor, but is nevertheless represented by officials in the discussions. The economic weight of Amsterdam makes this municipality in particularly crucial for the success of the Zaancorridor. Not in the last place because it is within the metropolitan area that most of the demand for housing and offices is generated (Companen, 2012).

The delineation in users and location is not logical when the dynamics of the spatial markets for housing and businesses are taken into account. The housing market – which is most relevant for the Zaancorridor – manifests itself at the regional level among different (sub) regions that compete in a highly erratic way (Chorus, 2015). The municipality of Uitgeest for example is functionally part of the housing market in the IJmond regions to the south-west of the Zaancorridor, and thus principally competes with municipalities in that region (Van Haastrecht, 2015). This complicates the coordination at the Zaancorridor, as this requires some degree of involvement of other municipalities in the three administrative housing regions that cover the Zaancorridor: Alkmaar, Kennermerland/IJmond and Amsterdam Noord. The planned transfer of Uitgeest to region Alkmaar will create a clearer administrative configuration only two housing regions, but cannot change the way in which the housing actually functions (BMC, 2012).

Proportional equivalence between benefits and costs

Good accessibility by train is a well understood benefit for all municipalities in the Zaancorridor. Both Uitgeest and Heerhugowaard equally welcome the idea of high-frequent service. Heerhugowaard – originally a policy-driven 'growth centre' – however also considers the Zaancorridor as an opportunity to create additional urban development (Rentinck, 2015). Something that is not felt in Uitgeest (Van Haastrechts, 2015). Less awareness exists among administrators about the potential complementarities between the rural northern and economic bustling southern extremities of the Zaancorridor. (Rentinck, 2015; Vereniging Deltametropool & Provincie Noord-Holland).

As with the benefits, municipalities also do not seem fully aware of the costs of providing 50% of the housing program at station locations in the Zaancorridor (Appendix VI). The regional alignment of urban development requires reassessment of existing urban development plans. These have to be cancelled or postponed in favour of TOD (Provincie Noord-Holland, 2014a). This has substantive implications for the municipalities. Chorus (2015) points out how municipalities created significant buffers at greenfield locations by deliberately assigning the 'preparation phase' of planning to potential development areas, only to keep them formally within the urban growth boundaries (BBG). This trend for example also shows in the assignment of 'pre-emption rights' to a whole range of greenfield locations by the municipality of Uitgeest (Gemeente Uitgeest, 2010; Van Haastrecht, 2015).

The legal and financial obligations and expectations from the past create a lasting incentive for municipalities to keep engaging into greenfield development (see Appendix VI for a full account). It has yet to show if these

¹¹ PHS stands for "Programma Hoogfrequent Spoor": a national program for high-frequent rail traffic that aims to improve both the railinfrastructure and train-service at the trajectory Amsterdam-Alkmaar and other busy trajectories in the Netherlands by 2028. (Appendix V)

adverse incentives can be overcome in regional alignment of the Zaancorridor. Illustrative of the challenge this poses is the municipality of Heerhugowaard, a self-declared frontrunner in the Zaancorridor. On the one hand Heerhugowaard heavily invests in the accessibility and attractiveness of the station, but on the other hand it deliberately holds housing development in extremely low densities nearby the station whilst higher densities are – planned to be – developed at other greenfield locations (Gemeente Heerhugowaard, 2011; RIGO research & advies, 2015).

According to Chorus (2015) this is a growth process that requires time: *The most important thing should be that it [urban development] is located at the Zaancorridor. And whether that is in municipality x or y doesn't matter that much. That is something they first have to see*" (Chorus, 2015). Van Haastrecht (2015) agrees to this, but doubts whether the reality of very locally oriented politics and the mistrust with regard to regional authorities allow for it in Uitgeest. Rentick (2015), personally a strong proponent of the Zaancorridor, is also sceptical about the scenario of municipalities that grant urban development to each other out of shared interests. In his view the commitment in the Zaancorridor until now is insufficient to suppress the competition between municipalities. As Rentinck (2015) for instance points out: *"The aldermen have committed themselves to Kiezen én Delen"²². But do you really think that when a Chinese investor comes to Heerhugowaard to build a skyscraper, that we as Heerhugowaard will say 'you know, perhaps Zaanstad is a better place'? If I can sell the land of my station area and speed up the spatial development, I obviously never do such a thing*". While expectations about the outcomes vary, there is general agreement on the fact that inter-municipal competition on housing (typologies), facilities (e.g. hospital), activities (e.g. pop-up festivals) and service provision (e.g. intercity status of Castricum) pose a central challenge for coordination and differentiation of TOD in particular (see Appendix VI for full details).

Collective choice arrangements

Municipalities can directly influence the decision-making processes at the Zaancorridor via a political-administrative platform of aldermen which is supported by cooperation of civil servants. Chorus (2015) explains how this model has been purposefully chosen to create commitment among autonomous municipalities, a thing that lacked in Stedenbaan (Chapter 4). The province currently takes the 'lead' in the Zaancorridor pilot, but eventually municipalities will need to step in (Chorus, 2015)

Rentinck (2015) however argues that the democratic legitimacy of the current model is flawed. The Zaancorridor is based on the representation of municipalities by their aldermen. What lacks is a strong mandate from the city council, the government body that bears the ultimate responsibility for land use allocation within the municipal jurisdiction (Ministerie van Infrastructuur en Milieu, 2012). Uitgeest is illustrative of the contradictions that this can create. The signed declaration of intent is of little value as long as the city council of Uitgeest has not decided its stance on the Zaancorridor. Particularly since Uitgeest is critical on external interference in local matters (Van Haastrecht, 2015). This manifests itself in a lack of active involvement of Uitgeest, as well as of Heiloo (Chorus, 2015). Understandably this makes regional alignment of the Zaancorridor more complex.

Monitoring

Zaancorridor, for the moment, lacks a dedicated monitoring system that adequately assesses demand for urban development and shows the actions of municipalities. The spatial assessment in Maak Plaats! shows some characteristics of a benchmark, but upon closer inspection falls short. For it assumes that the overall demand for urban development could simply be (re)distributed over the corridor according to Maak Plaats!

²² The proposed strategy and title of a Dutch report on TOD (PBL, 2014). It refers to choosing for TOD and sharing in the urban development in TOD (i.e. instigating functional differentiation).

principles. This policy-driven approach was criticised for its bias by Smit et al. (2014), perceived unrealistic in practice by Rentinck (2015) and acknowledged by Chorus (2015) as a limited theoretical exercise.

Some data for monitoring could be derived by the existing provincial monitors for housing and businesses in general (Appendix IV). At present these monitors do not link to public transport or station locations, even though they originate from 2015. The three relevant regional action programs (RAP) housing similarly lack a connection with the Zaancorridor (Appendix VI). Currently the province together with (private) actors is devising a more refined assessment of the qualitative housing demand and the qualitative potentials of different station areas along the Zaancorridor. Another element is the monitoring of the travellers' growth on the Zaancorridor, in cooperation with NS and ProRail. Taken together these insights should overcome the current lack of information and enable purposeful regional alignment between municipalities.

Graduated sanctioning

Sanctioning of non-compliant municipalities in the Zaancorridor

In the absence of a monitoring system, there is currently no clear sanctioning mechanism present either. It is up to the cooperating municipalities in the Zaancorridor to devise these institutions together with the content of the coordination.

In the future the province of Noord-Holland might incorporate the Maak Plaats! principles into the spatial regulation (Provincie Noord-Holland, 2013). Like with the urban growth boundaries (BBG) this would give the province the ability to sanction non-conforming behaviour. In the current political-administrative context Rentinck (2015) deems it unlikely that the province would quickly make use of this ability to overrule municipalities. According to Chorus (2015) "*the question is whether they dare it here,*" indicating the reluctance among provincial administrators to intervene and potentially "*...disturb the relation with the municipality concerned.*" All this gives the impression that the province will – for the time being – stick to its coordinating role as highlighted in article 3 of the declaration of intent (Provincie Noord-Holland, 2014).

Conflict resolution mechanisms

In the Zaancorridor there are no specially created arrangements for conflict-resolution yet. This means that the regular procedures in national legislation are to be used by municipalities in case of disputes. Chorus (2015) states that the RAP could be a source of inspiration for conflict-resolution in the Zaancorridor: "*We too had the question: 'what will happen when agreements are not met'. It appears that the provincial executive puts it back to the guiding committee. There it will be discussed how it can be that certain agreements are not met.*" This suggests a reliance on informal systems of accountability similar to those in Stedenbaan

In the face of the current mutual relations between municipalities it seems difficult to establish such a system. The discussion over the relocation of the hospital from Alkmaar to Heerhugowaard is a recent example of an incapability of two adjoining municipalities to perceive the common interests (Chorus, 2015). While there is formal cooperation in the Alkmaar region, political competition oftentimes has the upper hand in inter-municipal discussions. Examples such as the hospital "*seems to have disturbed the administrative relations. Because of that we are not able to clearly see what really matters in urban development*" (Rentinck, 2015). In *Uitgeest* the predominance of local political parties poses challenges for creating a regionally conflict-resolution mechanism that is locally supported. "*For national parties such as the CDA, PvdA, VVD, D66 are more inclined to look outside [their municipal borders], because they also have partners there. They will also be more inclined to acknowledge the bigger, shared interest.*" (Van Haastrecht, 2015).

Minimal recognition of rights to organize

The Zaancorridor is a relatively new concept that originated from the 2013 Maak Plaats! publication, but really surfaced with the declaration of intent in 2014. As a pilot, the Zaancorridor is for the moment still poorly embedded in the institutional context of the region. Regional policy and monitoring systems are not yet

related to the Zaancorridor, nor the Maak Plaats! principles. Moreover, even some provincial (sectoral) policies plainly counteract the establishment of TOD (e.g. the urban growth boundaries near Castricum station) (Rentinck, 2015). It has to show yet whether or not the Zaancorridor can establish an autonomous position in the Noord-Holland context. Here too, the regional alignment program will have to be awaited. Municipalities and province can in any case, never be excluded from the formal procedures that are established on national level.

Nested Enterprises

Driving force behind the Zaancorridor is the province of Noord-Holland. It is not clear yet to what extent the existing administrative structures in the province will take this pilot of the Maak Plaats! strategy. Van Haastrecht (2015) for example recognizes the complex relation of the Zaancorridor with the Metropoolregion Amsterdam, too which Uitgeest and the two 'heavyweights' in the corridor, Zaanstad and Amsterdam, belong. Another important issue – that was mentioned before – is the way in which the housing regions will relate to the Zaancorridor. Despite the predominance of housing in the urban development of the Zaancorridor, no connection with those administrative structures is made. As of yet it is unclear whether the housing alignment in the Zaancorridor is integrated into the housing region (i.e. like in Stedenbaan) or structured in an alternative way. Altering the regional housing agreements is crucial, for a change in the housing program at station locations is not simply possible: *"You have to take care not to create a competitor for other housing development within all the other agreements there are in the region"* (Rentinck, 2015).

The Zaancorridor does fit in quite well with the PHS and is supported by the public transport actors NS and ProRail. The municipalities are already engaged with the infrastructural processes in PHS (Rentinck, 2015; Van Haastrecht, 2015). And a refinement of the agreements with NS (i.e. like in Stedenbaan), should also provide the partaking municipalities with a better notion of the required travellers for a high-frequent service in 2028 (Chorus, 2015). The centralistic structure of the public transport sector however remains something beyond the control of the individual municipalities or province (Rentinck, 2015; also see chapter 4.1.4).

4.2.4 IMPLEMENTATION OF THE ZAANCORRIDOR

The analysis of the Zaancorridor via the Design Principles shows how many of the relevant institutions are still developing in anticipation of a regional alignment program. The baseline situation however shows how this pilot for TOD in Noord-Holland faces risks that are expected in case of a CPR: strong incentive for competition over attracting urban development and little compliance to the collective interests as long as clear institutions for coordination are not formed

The analysis shows how the dynamics of the housing markets, as well as the existing administrative structure of the housing regions, are insufficiently taken into account in the Zaancorridor. Moreover the commitment of the municipalities that are currently involved, is more fragile than the declaration of intent suggest. The local councils have not adopted the Zaancorridor yet. Nor do municipalities seem fully aware of the implications of the regional alignment for their land use capacity.

The costs (financially, legally and politically) of restricting greenfield development in favour of TOD are substantial. The potential benefits of the Zaancorridor may on the long-term compensate for these costs. However the current relations among municipalities and province do not show much ability to genuinely cooperate or acknowledge common interests yet. In absence of a strong regional alignment program with adequate monitoring and sanctioning mechanism, the Zaancorridor is unlikely to effectively counter the inherent incentive of individual municipalities to compete for regional facilities (e.g. the hospital) or a share of households.

The analysis shows how municipalities in the Zaancorridor are inclined to employ a strategy that results in a superfluous land use capacity for housing and thus potentially counter TOD. The individual rationality for municipalities seems to be a continuation of the strategy of creating and retaining land use capacity at

multiple locations within the administrative borders. The 'natural' tendency of geographical competition is unlikely to be countered with few institutional arrangements that are currently in place for the Zaancorridor. These institutions may over time evolve and provide a stronger incentive to municipalities to comply with the collective rationality of coordinating land use capacity for the establishment of the Zaancorridor. That however requires engagement into the issues that were raised by the application of the Design Principles.

4.3 LOOP CITY

This chapter is concerned with a TOD-based comprehensive planning strategy for Greater Copenhagen. In it, the collective planning perspective of Loop City is contrasted with the institutions that influence the actual decision processes of individual municipalities. The basis of this analysis is formed by the more detailed description of the spatial and institutional context, full accounts of the involved actors and other relevant information in Appendix VII.

4.3.1 INTRODUCTION

Loop City refers to a planning concept that was created by 10 municipalities in Greater Copenhagen, the Danish government and other (private) institutes as a sequel to the influential Copenhagen Fingerplan (Realdania, 2010). It proposes a 'circular city' in which 10 contemporary challenges on sustainability integrated into a high speed metro trajectory that crosses the Oresund Strait to Malmo and Lund to form a Pan-Scandinavian 'loop'. That way Loop City provides a new spatial structure for urban renewal of old (industrial) areas in the suburbs of Copenhagen and forms a long-term vision for sustainable urban development.

Loop City is concretized as the 'Ring 3' light rail (The Ringby Light Rail Partnership, 2013a). In 2021 this newly built light rail should connect the separate 'fingers' of Greater Copenhagen via a corridor that runs

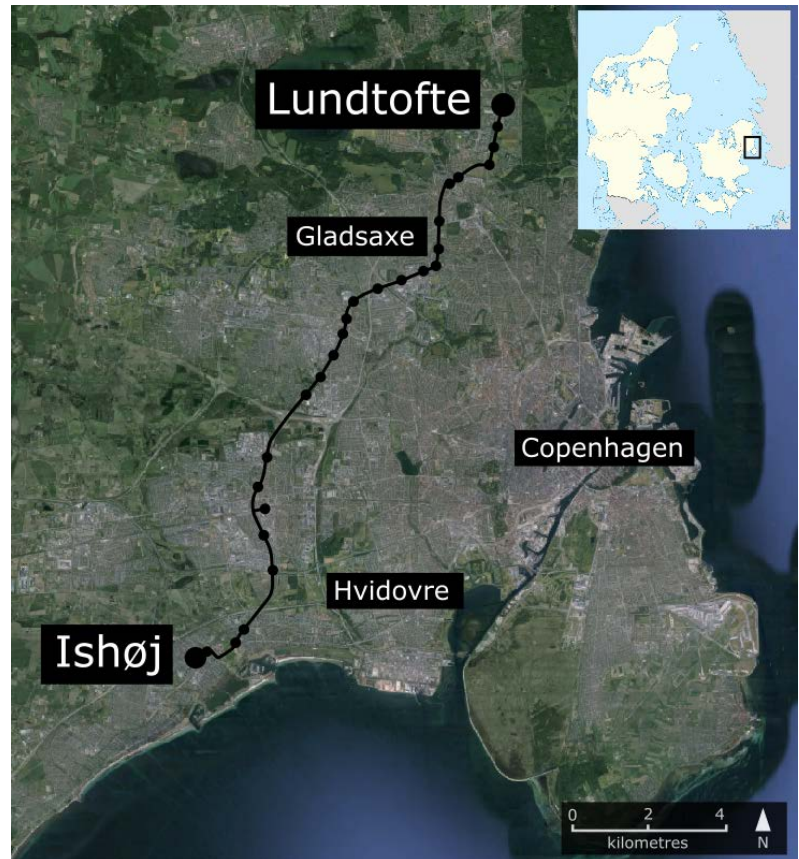


Figure 16: The trajectory of Loop City in the Greater Copenhagen area (Author, 2015)

from north to south roughly parallel to highway 3 (figure 16). The improvements in the public transportation system should create new opportunities for urban (re)development along the Ring 3 corridor. Transformation and densification of the station areas should boost the economic growth of the adjacent 11 municipalities.

4.3.2 THE COLLECTIVE DEVELOPMENT PERSPECTIVE

The Ring 3 light rail

The municipalities co-initiated the light rail together with the Capital Region of Copenhagen and the State. By means of a 2011 agreement the partners further investigated the possibilities of such a public transport connection (Ringby Letbanesamarbejdet, 2011). The resulting Light Rail Ring 3 report showed how the Loop City ambitions had to be downgraded to be made feasible. The proposal to implement a light rail into the existing road infrastructure between Lyngby and Ishøj was continued in another agreement by the municipalities, capital region and the Danish State (The Ringby Light Rail Partnership, 2013b). Via a jointly owned company Ring 3 Letbane I/S preparatory work on the construction and the commission of the light rail

is being done, in anticipation of the formal procedures and the final approval of the project by the Danish government (Ring 3 Letbane I/S, 2014).

Economic potentials of urban regeneration

Municipalities currently focus on the rigging of the infrastructure and exploitation of the Ring 3 light rail. The light rail is however a prerequisite for the economic growth potential that is attributed to the transformation and densification of the land use in the corridor; an estimated growth potentials of 20.000-40.000 new residents and about 10.000-20.000 new jobs (by 2032), up to 90.000-110.000 jobs when the full development volume is used. (The Light Rail Partnership, 2013a). This is a significant economic boost for the area that faced a net loss of 6.356 jobs (-3%) in the period 2009-2013 (Ringbysamarbejdet, 2014). While these figures of the feasibility study are more modest than the original Loop City ambition, they lean on the same principles of coordinated densification and diversification of the areas around the corridor. The central notion is that municipalities use the improved connectivity to transform and intensify the land use around the stations according to the areal differences along the corridor. This notion is based on a regional analysis of the natural diversity among municipalities that was used to create a set of 'urban identities' for the municipalities that complied with the 10 contemporary challenges (Realdania, 2010).

Preliminary implementation of Loop City

As reaction on the 2013 agreements, the latest Fingerplan states that "*profiling and strategy for the realization of these [urban redevelopment] potentials will be discussed in cooperation between the Environmental Protection Agency and the municipalities concerned*" (Miljøministeriet, 2013, p. 48). The potentials for functional differentiation were elaborated further by showing certain characteristic (strengths and weaknesses) for each municipality, based on recent demographic and economic trends (Ringbysamarbejdet, 2014). When contrasted with an (preliminary) assessment of the development plans of the municipalities, a discrepancy with the demand for urban development showed. In Loop City as a whole there is "*an excess of urban transformation to commercial buildings rather than homes*" (ibid, p. 9-10). The 'common knowledge base for urban regeneration', as the report is titled, therefore pleas for targeted collaboration among municipalities and the market to create the highest collective yield for Loop City. According to Kraag (2015) discussions on programmatic alignment and differentiation start to develop, but still remain a sensitive issue. As of yet no agreements exist on the coordination of urban development informally or via formal land use policies.

4.3.3 INTERACTIONS IN LOOP CITY PERCEIVED VIA THE DESIGN PRINCIPLES

The Design principles are used to show the (potential for) implementation of the Loop City by municipalities in the current institutional context. Reference is made to the background of this case and a detailed description of perspectives of the Ringbysamarbejdet (Light Rail Partnership) and the municipalities of Hvidovre and Gladsaxe in Appendix VII.

Well-defined boundaries

Over time the visionary trans-national perspective in Loop City was narrowed down to a light rail corridor from the north to the south of Greater Copenhagen (The Light Rail Partnership, 2013) The Loop City vision proved "*too ambitious, too experimental and too modern for most municipalities*" (Hertz Dalhgren, 2015). Still the basic idea is left intact and can – on the long run – be expanded geographically (the crossing of the Oresund Strait) and content-wise (incorporate more elements of sustainability into the corridor-development). For the moment however, the branch of the original trajectory across Hvidovre towards the airport at Amager is left out of the Ring 3 plans as it would be unfeasible in the exploitation (Schelde, 2015). The purpose of Loop City also shifted during the process. "*It started as a mean to reduce traffic, but turned into a development model to attract economic growth*" (Hertz Dalhgren, 2015). While no significant reduction of road congestion is expected, the light rail does provide an alternative for the new travel demand that is generated by the existing and new urban development (Ringby-Letbanesamarbejdet, 2013).

Apart from some ideas for differentiation, no further specification or delineation of the urban development is provided for the moment. While the Loop City documentation does not explicitly refer to spatial markets, they are likely bound up with the general developments in the metropolitan area of Copenhagen (OECD, 2009). The economic growth and influx of people in the inner city of Copenhagen may – in time – spill over to the suburban 'shell' that encircles these pressured core areas (Realdania, 2010; Schelde, 2015).

Membership lies with the 11 so-called '*Ringby Kommunes*': the Loop city municipalities that form this suburban 'shell' around the municipality of Copenhagen. Of these municipalities 9 have one or more stations directly at the Ring 3 light rail. The municipalities Høje-Taastrup and Hvidovre partake as they expect indirect benefits from their involvement (Miljøministeriet, 2015; Ringbysamarbejdet, 2014). It however also signals a "*kind of brotherhood among the municipalities*", that according to Schelde (2015) is motivated by the strong party-political ties among the Social Democrats in the Loop City.

Proportional equivalence between benefits and costs

The link between the (potential) economic benefits of public transport and the costs of creating the light rail is incorporated into the Loop City Partnership in an indirect way. The new light rail is planned to be provided self-sufficiently by making use of the future revenues of the operation of the light rail to pay for the initial investments. According to the latest prognosis, the debt will be fully paid in 2059 (Ring 3 Letbane I/S, 2014). The funding is shared between the state (40%), the municipalities (34%) and the capital region (26%) in the Ring 3 Letbane I/S company. The share of the municipalities is further split-up proportional to the potential benefits that the alignment of the light rail provides for each municipality. The formula that is used accounts for the potential economic benefits of the light rail by incorporating population size (45%), amount of new stations (40%) and proximity of the stations to the core area (15%) into the weighing for each municipality (Ringby-Letbansamarbejdet, 2013).

Implicitly it indicates the potential for urban regeneration for each municipality based on their connectivity to the new public transport corridor. The proportional share is however not extended to some form of land use coordination among the municipalities, despite years of intent to establish such a mechanism (Ringby-Letbanesamarbejdet, 2011; Kraag, 2015). The absence of coordination resulted in a threatening oversupply of business areas, an undersupply of residential development and a lack of functional differentiation along the corridor (Miljøministeriet, 2013; Ringbysamarbejdet, 2014). The municipality of Gladsaxe for example uses Loop City to more than triple its largest business district (jump from 10.000 to ultimately 45.000 jobs)(Gladsaxe Kommune, 2013). Other municipalities have similar plans to transform and intensify business areas (Ringbysamarbejdet, 2014). According to Hertz Dahlgren (2015): "*...all the municipalities want more or less the same. To attract more companies, not necessarily a special branch of companies. It might be about the fight to survive*". This suggests geographical competition among municipalities for the economically most profitable functions. Whereas businesses directly provide financial and economic benefits, residential development requires investments in public facilities (e.g. schools, leisure areas) which are beneficial to municipalities only on the long run (Hertz Dahlgren, 2015).

This rationality for municipalities to opt for the same urban development also results from the lack of applicability of most of the urban identities that Loop City suggests (Ringby-Letbanesamarbejdet, 2011). The transformation of Avedøre Holme to an 'Industrial Leisure Park', for example, is no realistic option since it is the area within Greater Copenhagen where high-class industrial functions are concentrated (Schelde, 2015; Hvidovre Kommune, 2014). The only real exception is Lyngby-Taarbæk, which is branded as 'The Shopping Hub' (based on an existing regional shopping centre) and as 'The Science City' (based on the large Danish Technical University) (Realdania, 2010). Even before Loop City was introduced, Lyngby-Taarbæk "*started a department just to work with the knowledge and education concept*" (Hertz Dahlgren, 2015). The impression of the involved urban planners is that the municipalities in Loop City are in a different league: the southern municipalities are less involved and gain less in comparison to the northern municipalities (Hertz Dahlgren, 2015; Schelde, 2015). Lyngby-Taarbæk and Gladsaxe in particular have "*the visions of making the residential*

and commercial functions around the trajectory." (Schelde, 2015). These 2 municipalities however also gain most land use potential through the construction of the light rail, as suggested by the relatively high share (44,1%) of the total municipal investments in the construction of the trajectory (Folkengstidende, 2013). It shows how the relatively bigger and affluent municipalities have the ability to 'kick-start' this kind of long-term planning, whereas other municipalities lack the staff, expertise and investment power. (Hertz Dahlgren, 2015). The lack of collective arrangements for urban development creates an unwanted situation that Hertz Dahlgren (2015) describes as: *There might be winners and losers, but we don't know that yet. I think it is an issue that we all try to relate to, but we don't know which tools to use to avoid that.* (Hertz Dahlgren, 2015).

Collective choice arrangements

The influence of municipalities in Loop City is quite large. The Ringby municipalities initiated Loop City to create the support by higher-tier government. While national and regional authorities are involved, the municipalities still have much say in it. Indicators of this are the shared ownership of the Ring 3 Letbane I/S company and the political representation of municipalities in the board (Ring 3 Letbane I/S, 2014).

While the coordination of public transport is quite advanced, the coordination of land use in the Ring 3 corridor is something that yet has to be settled among municipalities. The initiative for coordination is left to the municipalities, who "will jointly prepare an actual tool for local regeneration and a joint communication and marketing strategy for the Circular City and perspective of LOOP City" (Ringby-Letbanesamarbejdet, 2011, p. 9). Despite encouragements in both agreements and much of the created documentation little coordination of land use emerged. According to those involved, the awareness starts to grow and an organization is being established. The Ringbysamarbejdet ('Loop City Partnership') is still limited to a department of 2 people and contacts with urban planners at each municipality (Hertz Dahlgren, 2015). Because of the local political dynamics, the coordination will likely be based on encouraging certain land uses, rather than imposing restrictions on urban development (Kraag, 2015).

In Loop City political representation is structured via a forum of mayors which supervises a guiding committee of municipal directors. This is elaborated mainly into the Ring 3 Letbane I/S company (together with other partners) and on little with regard to urban development (Ringby-Letbanesamarbejdet, 2015).

Monitoring

Institutions for the monitoring of urban development in Loop City are not established. The 'common knowledge base for urban regeneration' provided the best overview of the demand for urban functions and actual allocation of land use capacity yet, but only at very general level (Ringbysamarbejdet, 2014). It is moreover not a fixed or recurring instrument per se as the coordination of the urban development has yet to get shape in the Ringbysamarbejdet (Hertz Dahlgren, 2015; Kraag, 2015). The public transport component of the Ring 3 light rail is more strictly monitored. Each year the Ring 3 Letbane I/S company delivers a detailed monitor on the process and financial balance of the construction, commission and operation of the light rail. Urban regeneration or programmatic alignment is not covered in the monitor at all (Ring 3 Letbane I/S, 2014).

Graduated sanctioning

No sanctioning mechanism has been created in Loop City as far as urban development is concerned. In absence of agreements to coordinate, no clear distinction can be made between compliant and non-compliant behaviour. The central government makes a general appeal to the municipalities to solve the imbalance, but does not engage into holding individual municipalities accountable (Miljøministeriet, 2013).

Conflict resolution mechanisms

Because sanctioning is not agreed upon in a collective arrangement, municipalities may make use of their right to object to the proposed land use plans of other municipalities when this harms their own development. When municipalities object, they engage in dialogue, possibly with the Ministry of the Environment as mediator (Galland and Enemark, 2012). The municipalities in Loop City however are hesitant in making use of

this instrument: *"Of course if everyone would veto each other's plan it is good for no one. It rarely happens."* (Hertz Dahlgren, 2015).

Minimal recognition of rights to organize

Despite the early phase of Loop City it is already reasonably well-embedded in the wider institutional context. As a guiding principle for land use development it complements and builds on the planning legacy of Copenhagen. It was incorporated into the Fingerplan 2013, despite its still preliminary status (Miljøministeriet, 2013). The autonomous position of Loop City moreover shows in the co-investment of the regional and central authorities into the Ring 3 Letbane I/S company. All indications are that municipalities are provided with the leeway to create their own arrangements for coordination of the land use in Loop City.

Nested Enterprises

There is in Copenhagen a strong public transport culture and politics, which is supported by the 1947 Fingerplan. Of particular importance is the 'proximity to station principle' that obliges large office buildings and commercial facilities to locate within a 600 metre radius from a public transport node (Miljøministeriet, 2013). It is a principle that shaped the urban structure of Copenhagen, even though the adherence of municipalities has been faltering from time to time (Hartoft-Nielsen, 2013). With the strengthening of the principle in the latest two iterations of the Fingerplan, it creates an implicitly understood focus of urban development in public transport corridors such as Loop City.

The abolishment of the regional authority in the structural reform of Danish Planning in 2007 poses a decisive institutional change for land use coordination in Loop City. Prior to the reform, the regional government oversaw coordination of the collective interests of the Greater Copenhagen area. Hertz Dahlgren (2015) recalls: *"They looked to all these issues. They asked the question: 'Is this really good for the region or only for this municipality?'"* The capital region is still involved in Loop City, but has no authority over planning anymore. That authority belongs to primarily to the municipalities and – in second instance – too the Ministry of the Environment that can intervene when national interests (e.g. those in the Fingerplan) are at stake. The absence of the regional authorities compromised the metropolitan governance and has created numerous inter-municipal challenges in spatial coordination (OECD, 2009; Galland and Enemark, 2012). The inability start inter-municipal coordination of green and blue belt is illustrative of the struggle of the central government to make municipalities engage into regional planning (Hertz Dahlgren, 2015). There exists a tradition among municipalities to primarily engage into local affairs and largely neglect wider societal trends that may eventually impact the local situation on the long term (Schelde, 2015). With Loop city this tradition may be reverted, as *"the light rail project might help learn them [the municipalities] to coordinate"* (Hertz Dahlgren, 2015). From that perspective Loop City stands for more than a regional TOD strategy. Arguably it is an effort to create inter-municipal coordination and re-invent regional planning.

4.3.4 IMPLEMENTATION OF LOOP CITY

The analysis of Loop City via the Design Principles shows how many of the created institutions are directed at the establishment of the Ring 3 light rail trajectory. The set of institutions that target urban development and instigate some form of land use coordination among municipalities largely misses. This manifests in a tendency of the corridor as a whole to create an oversupply development plans for commercial (firms) functions and an undersupply of future land use capacity for housing. From the CPR-framework this is not strange, considering that Loop City is perceived by the municipalities as a model for economic growth by which they collectively increase their share of households and businesses in Greater Copenhagen. In absence of clear institutional arrangements for coordination the individual rational choice is to maximize the individual share in the economic potentials that the development of the Ring 3 light rail provides to the 11 municipalities collectively. In that assessment municipalities seem to prefer businesses over housing, possibly due to the short-term gains that these provide and the small initial investment that is required.

In addition to that municipalities all differently share in the potentials of the light rail (e.g. stations, adjacent areas). This is accounted for in the share of interest in the Ring 3 Letbane I/S company, but not related to coordination of land use. Moreover, not all municipalities were assigned with an equally feasible 'urban identity'. Most of the municipalities – for the moment – refrain from further developing their own unique profile, and instead divert their efforts to the generic urban development potential. The idealized maximization of the collective yield of Loop City – through functional differentiation – will under the current circumstances not take place.

Municipalities are put in the position by higher tier government to devise collective arrangements (e.g. monitoring, sanctioning and conflict-resolution), but currently fail to make use of this leeway. Due to the recent abolishment of the regional authority in planning, a tradition of regional planning supported by inter-municipal coordination does not exist. Despite the threatening misbalance and missed synergies in urban development of the corridor, there nevertheless exists a strong focus on allocation more intense land use at station locations. The nationally installed 'proximity to station principle' as well as the financial exposure of all municipalities in the Ring 3 Letbane I/S company, create a strong incentive to concentrate urban development at Ring 3 station locations.

5. CROSS-CASE COMPARISON

In this chapter the empirical insights of the three cases in chapter 4 are compared. This puts the findings into perspective and creates the validity that is required to assert to what extent the conceptualisation of TOD as CPR is justified (chapter 6). The comparison is structured similarly to the separate cases: a qualification of the implementation and the configuration of the institutional arrangements.

5.1 QUALIFYING THE IMPLEMENTATION

In the CPR framework the implementation of TOD is benchmarked as the conformity of municipal choices in the allocation of land use capacity for households and businesses with the inter-municipal agreements for coordination of TOD. For that purpose the (implicitly) agreed goals of coordination are contrasted with the preliminary¹³ outcomes of municipal land use choices. The results of this comparison across the three cases are presented in table 8.

5.1.1 GOALS

The overview shows how the goals of land use coordination in TOD can be traced back to the distribution of households and businesses, albeit in a slightly different way. The goal in both Dutch cases is formulated as a proportion of the estimated demand for urban development in the region, which is translated to an indicative target for homes and offices. In Loop City the ambition is expressed in a number of residents and jobs that is to be realized after the construction of the new light rail. Despite substantive differences, municipalities in all cases are required to enable and restrict certain land uses in facilitating TOD.

Table 8: Overview of the goals of TOD coordination in three cases

	STEDENBAAN	ZAANCORRIDOR	LOOP CITY
Coordination	Allocating a proportion of the estimated demand for urban development at station locations	Allocating a proportion of the estimated demand for urban development at station locations	Allocating a number of residents and jobs at station locations
Differentiation	Systematically via station profiles / typologies	(Ideas, not agreed) Systematically via station profiles / typologies and conceptual station identities	Conceptual by means of 10 'urban identities'

Differentiation among stations (chapter 2.1.3) plays a role in all three cases. In Stedenbaan and Loop City it is a direct part of the inter-municipal agreements. In the Zaancorridor differentiation is no part of the agreements, but clearly an idea that is encouraged and explored further by the province. In both Dutch cases variants on the node-place model (chapter 2.1.3) are used to systematically create differentiation between stations. This is different from Loop City that formulates differentiation on a conceptual level as unique urban identities in which no particular hierarchy shows. Similar ideas are also explored in the Zaancorridor to complement the station typologies.

¹³ The implementation of TOD is an ongoing process in all three cases. The assessment qualifies as an ex-ante (Zaancorridor and Loop City) or ex-durante evaluation (Stedenbaan).

Table 9: Overview of preliminary outcomes of TOD coordination in three cases

	STEDENBAAN	ZAANCORRIDOR	LOOP CITY
Coordination	Projected results barely meet minimum scenario; increasingly negative outlooks	Land use capacity at station locations is barely expanded or transformed to accommodate denser typologies	Threatening oversupply of business locations and a undersupply of housing at stations locations
Differentiation	No differentiation is established	No differentiation is established	No differentiation is established

5.1.2 PRELIMINARY OUTCOMES

The outcomes of TOD is an ongoing in all three cases (table 9). For Stedenbaan, which started almost 10 years ago, the results can be assessed best. Implementation is happening, but the prognosis for urban development at stations keeps diminishing. Based on the current outlooks, the goal of allocating a certain share of urban development at station locations is at risk. It shows that municipalities in the past years retained much land use capacity and development plans for other (greenfield) locations. In the Zaancorridor similar tendencies can be observed, with the important difference that implementation is still in an early phase, because of which outlooks can still change more easily. In Loop City implementation is a matter of the future, as the public transport has yet to be provided for the places where urban development is agreed upon. In their urban planning municipalities however already show strong focus on intensifying land use at the future station locations. Implementation there shows an imbalance in land use among stations; a threatening oversupply development plans for businesses and an undersupply for housing. This imbalance in Loop City illustrates how deliberate differentiation between stations (and among municipalities) is not being implemented, as most municipalities opt for the same generic urban development. Neither the more systematic 'typologies' – in Stedenbaan and Zaancorridor – nor the conceptual 'identities' – in Loop City and Zaancorridor – prove directly applicable for municipalities in their search for differentiation of land uses.

5.1.3 DISCREPANCY IN IMPLEMENTATION

The unique properties and different stadia of the cases render a direct comparison of a 'level of implementation' impossible. The overview however makes clear how there is a – potential – discrepancy between the collective development perspective (the shared goals) and the actual outcomes of coordination by municipalities in all three cases. In chapter 5.2 this general impression of faltering implementation is elaborated by comparing the institutional configurations of each of the three cases.

5.2 CONFIGURATION OF INSTITUTIONAL ARRANGEMENTS

In the CPR-framework (chapter 2.3) coordination can be understood as a series of institutional arrangements that makes municipalities use their authority over land use in support of TOD. The configuration of these institutional arrangements was systematically analysed for each of the three cases by means of the 8 Design Principles (chapter 4). The cross-case comparison of the institutional configurations helps assert how the – potential – collective outcomes indicated in chapter 5.1 can be traced back to the strategy selection process of municipalities, which is – in turn – based on the specific context (2.3.3). For that purpose the strength of each of the 8 Design Principles is qualified roughly as missing, present or functioning conform chapter 2.3.2. This qualification is indicated here as:

QUALIFICATION	SYMBOL
Missing institutions	-
Presence of institutions	+/-
Functioning institutions	+

5.2.1 WELL-DEFINED BOUNDARIES

Table 10: The delineation in terms of membership, location and content

STEDENBAAN (+/-)	ZAANCORRIDOR (+/-)	LOOP CITY (+)
Based on administrative structure of the South Wing	Based on the transportation corridor between Alkmaar and Amsterdam	Based on the new transportation corridor in Greater Copenhagen

The boundaries of the TOD strategy are differently structured in all three cases. The Stedenbaan uses the existing administrative structure in the South Wing as foundation for the coordination of TOD. This allows for an integration of TOD with other policy areas and involves all municipalities (at least those within the provincial borders) that affect the allocation of land use. The downside of such a comprehensive delineation is that it can quickly become too complex and extensive to clearly translate from the regional discussions to municipal choices; a process that currently shows in Stedenbaan. In contrast with a delineation based on administrative structures, the Zaancorridor and Loop City use the public transport corridor as basis for establishing boundaries. Fewer municipalities are involved this way and a more tangible connection is present with the corridor at which the TOD has to take place. The confinement to the municipalities directly at the corridor is relatively clear and simple, but may not encompass the spatial markets (*resource system*) that are known to extend beyond municipal jurisdictions. This shows particularly in the Zaancorridor. The housing markets nearby Amsterdam are inherently different from the peripheral regions, and moreover organized via different administrative structures to which no explicit connection is made. In that regard the delineation of Loop City is relatively more coherent. The Ringby municipalities make part of Greater Copenhagen and despite socio-economic differences roughly share in the spatial markets that apply to the entire metropolitan area. In addition to that the boundaries to the partnership are reinforced by the shared party-political ties among the municipalities.

5.2.2 PROPORTIONAL EQUIVALENCE BETWEEN BENEFITS AND COSTS

Table 11: The distribution of the costs and benefits between municipalities

STEDENBAAN (-)	ZAANCORRIDOR (-)	LOOP CITY (+/-)
No clear model for proportional cost-benefit sharing	No clear model for proportional cost-benefit sharing	Cost of the light rail are related proportional to the potential land use benefits

The individual and collective benefits of the TOD strategy are generally known and valued by municipalities. Among and within the three cases the emphasis in the appreciation differs. It varies from improvements in public transport and urban development potential, up to economic competitiveness, gains in sustainability and other related issues. Generally speaking Loop City makes the benefits of TOD more tangible (economic growth potentials of the corridor) than the Dutch cases (connectivity and international economic comparativeness).

More distinct differences show in the structure of the costs of TOD. In both Dutch cases the costs of TOD lie in the reshuffling of the spread of existing urban development potential. In other words to restrict (policies for) land use capacity at greenfield locations in favour of land use capacity at station locations. This is costly to municipalities for two interrelated reasons. First it requires municipalities to relinquish their past claims, investments and obligations in those greenfield locations. As many municipalities were (are) oriented to greenfield development the financial losses or missed potential profits are significant. Secondly it can put municipalities into a competitive disadvantageous position over attracting households and firms if others do not equally restrict greenfield development. The restriction of greenfield development is less of an issue (i.e. less costly) in the Danish case. Loop City is located amidst the existing urban area of Greater Copenhagen, where there are simply less opportunities for greenfield development. More focus has been put on TOD due to a tradition for it in urban-regional planning, especially where businesses or regional facilities are concerned.

Instead a large portion of the costs of Loop City lies in the establishment of the new light rail. Municipalities make investments (and are subject to financial risks) in anticipation of the economic returns of future urban development in the corridor.

In none of the three cases there is a clear model that proportionally shares all the costs and benefits of TOD between municipalities. In the Dutch cases the equalization mechanisms in coordination are not yet devised and likely hard to establish due to relatively high costs of land use restriction. Without guarantees on the collective benefits of TOD, the individual rational choice for municipalities is to minimize their inputs (take no losses in past land investments) and maximize their geographical competitiveness (retain land use capacity at various types of locations). In Loop City there is an implicit form of cost-benefit division present. For the contribution of each municipality to the new public transport infrastructure is approximately proportional to the urban development potential that each municipality gains from alignment to the light rail. This creates a strong incentive for municipalities to allocate urban development at station locations in order to retrieve the costs of the light rail. However, since there are no rules regarding the type and amount of urban development, the individual rational choice for municipalities is to maximize their share of business development in the collective benefits. This narrows down the competition to station locations, but doesn't take it away.

5.2.3 COLLECTIVE CHOICE ARRANGEMENTS

Table 12: The influence of municipalities on the process and content of coordination

STEDENBAAN (-)	ZAANCORRIDOR (+/-)	LOOP CITY (+/-)
Indirect influence Asymmetric representation	Direct influence	Direct influence

All three cases of TOD have a political platform where the implementation of TOD can be discussed and collective arrangements can be modified. What differs among the cases is the degree to which municipalities are able to use local experiential knowledge for the coordination. In the Stedenbaan the influence is mostly indirect since municipalities are being represented via their regions, save Rotterdam and The Hague who – apart from regional representation also – directly partake in modifications of the Stedenbaan. The asymmetrical representation is something that is felt among municipalities that are indirectly represented at the South Wing level and affects commitment to Stedenbaan. The representation is different in the Zaancorridor and Loop City where all municipalities are in the position to directly influence the coordination of TOD via their platforms. The issue in those cases is that municipalities are not truly engaged in creating or modifying these arrangements for land use. In the Zaancorridor this can be explained by the fragile commitment of municipalities, because of which the province initiated the formation of land use coordination. In Loop City municipalities the establishment of the public transport receives most attention, which makes inter-municipal coordination of urban development a relatively neglected issue for the moment.

5.2.4 MONITORING

Table 13: The availability of information about the demand for urban development and the actual allocation of land use capacity by municipalities

STEDENBAAN (+/-)	ZAANCORRIDOR (-)	LOOP CITY (-)
Recurring self-devised monitoring of regions	Incidental monitor	Incidental monitor

An assessment of the demand for urban development and an overview of municipal development plans have been provided in all three cases at some point. They served the purpose to formulate or refine the TOD concept or strategy. A similarity among these assessments is that they are approximate and prognosis is highly unpredictable. Structural monitoring mechanisms are only present in Stedenbaan. Since its start a yearly monitor was established that keeps track of the land use capacity and gives a prognosis of the spatial program (and NS 'business case') in 2020. The monitor is using the granularity of regions, which means that

the actions of individual municipalities are not (directly) traceable. No similar recurring forms of monitoring are specified yet in the Zaancorridor and Loop City.

5.2.5 GRADUATED SANCTIONING

Table 14: Sanctioning of non-compliant municipalities

STEDENBAAN (+/-)	ZAANCORRIDOR (-)	LOOP CITY (-)
Informal and indirect (political) sanctioning at the regional level	Not present	No present

None of the three cases contain a clear form of (graduated) sanctioning of municipalities that do not comply with goals of land use. In the Zaancorridor and Loop City this is not surprising, since monitoring systems are not developed in those cases, making enforcement practically impossible. For enforcing compliance with the goals of TOD first requires making the compliance of municipalities with these goals visible. Because regional level monitoring is used in Stedenbaan, there is no clear system to hold individual municipalities accountable. It appears to be a diffuse informal process that relies on political accountability of municipalities within regions. When this fails the province provides a 'safety net' that can be used to sanction individual municipalities. Its use is controversial and lacks precision. As such it is more aimed at forcing region to better account for the implementation of TOD by addressing their municipalities.

5.2.6 CONFLICT-RESOLUTION MECHANISMS

Table 15: The handling of disputes between municipalities

STEDENBAAN (+/-)	ZAANCORRIDOR (-)	LOOP CITY (-)
Informal process (in regions)	Informal process	Informal process

The administrative-political platforms allow for dispute resolution in all three cases. In the Zaancorridor and Loop City these platforms allow for direct inter-municipal discussion over the interpretation of rules related to the implementation of TOD. In the Stedenbaan dispute resolution is structured via the two-tier system of regional and South Wing platform. Municipalities cannot access these directly. No formal conflict-resolution mechanisms (clear and fixed procedures) are in place in any of the three cases. Like in the sanctioning process, the discussions rely on informal political processes that are highly relational in nature. In all three cases municipalities can escalate the conflict by falling back on formal procedures in spatial and administrative law.

5.2.7 MINIMAL RECOGNITION OF RIGHTS TO ORGANIZE

Table 16: The recognition of the autonomous position in the wider institutional context

STEDENBAAN (+)	ZAANCORRIDOR (-)	LOOP CITY (+/-)
A well-embedded 'brand'	Poorly embedded	Reasonably embedded

The degree to which the TOD strategies have an autonomous position in the wider institutional context greatly differs among the cases. The Zaancorridor receives least recognition of all cases. As of yet few of the local, regional (and even some provincial policies) relate to this provincial TOD-pilot. Stedenbaan on the other hand poses a well-known strategy and even 'brand' in the South Wing. It is integrated well in provincial, regional and local policies, but positioned as merely one of several – sometimes opposing – development strategies for urban development in the area. More unanimous support exists for Loop City despite the early stage of this strategy. It is the dominant development perspective for the Ringby municipalities and supported policy-wise and financially by the regional and central government as commitments in the Ring 3 Letbane I/S show.

5.2.8 NESTED ENTERPRISES

Table 17: Support by other related policies and processes in the wider society

STEDENBAAN (+)	ZAANCORRIDOR (-)	LOOP CITY (+/-)
Polycentric, but vulnerable to external changes and wavering internal support	Little support	Well supported, but vulnerable due to inability to regional planning

This broad aspect widely varies within and among cases. Loop City in a planning culture that favours TOD (e.g. proximity to station principle), but lacks the necessary tradition for inter-municipal coordination due to the abolishment of regional planning authority. Stedenbaan established a tradition for TOD in the administrative framework of the South Wing. The theoretical benefits of the polycentric management in the South Wing however do not come to fruition due to a lack of bottom up (municipal) support (chapter 5.2.3) and is moreover vulnerable to the current discussion about its future structure. Apart from the province Noord-Holland as driving force and the relation with the public transport (PHS) program, the Zaancorridor is only little supported by the wider institutional and societal context. A major difference between the Dutch and Danish cases is the control over the public transport improvements. In both Dutch cases these improvements are part of the coordination, but ultimately beyond the control of the municipalities (i.e. Dutch Railways (NS) can opt-out). In Copenhagen the municipalities are co-owners of the Ring 3 Letbane I/S and as such share authority over the improvements in public transport.

6. DISCUSSION

This research aims to explore the effects of inter-municipal competition on the implementation of TOD. Since this TOD literature provides little insight on competition, inspiration was drawn from institutional theories on CPR. These theories target collective-action problems that seem equivalent to that of TOD. In order to assert to what extent both disciplines can be combined to form a new analytical frame, the following central research question was formulated:

How can the CPR-framework help understand the role of inter-municipal competition in the implementation of TOD?

Based on the three cases (chapter 4) and the cross-case analysis (chapter 5) the central research question can be answered. This is done by providing a recap of the CPR-framework in chapter 6.1 that relates back to the conceptual model (chapter 2.3). In chapter 6.2 the validity of the CPR-framework is asserted by discussing the presence of CPR characteristics in TOD and the value of the Design Principles for understanding strengths and weaknesses in the inter-municipal coordination of TOD. These discussions form the basis for the actual conclusion in chapter 6.3.

6.1 RECAP OF THE CPR-FRAMEWORK

In chapter 2.3.1 it was argued how the lack of implementation in TOD could be understood as an instance of a CPR. This resource conceptualised as the land use and transport interactions in the urban region (*resource system*) that generate demand for urban development (*resource units*) through spatial markets. Municipalities can facilitate this demand by using their authority over land use to create land use capacity (assign development rights) to certain locations within their jurisdiction. This enables and restricts location-decisions of new households and businesses. Cumulatively these location-decisions shape the land use and transport interactions on the urban regional level (*resource system*). The urban development patterns that emerge over time can either facilitate TOD (e.g. denser, more diverse urban development nearby transit nodes) or counter TOD (e.g. car-based urban sprawl).

This chain of events embodies the land use and transport feedback cycle (chapter 2.1.2) with a focus on the role of municipal discretion over land use (chapter 2.1.5). In this perspective municipalities can use their authority over land use to jointly with other municipalities facilitate TOD (i.e. 'produce' the *resource system*) or engage into geographical competition (i.e. 'under-produce' the *resource system*). Here the two distinctive features of a CPR come into play (chapter 2.2.2). The first, high subtractability of use, can be understood as the limited 'stock' of demand for urban development in the urban region (*resource system*). When urban development locates somewhere (i.e. the *resource unit* is 'used'), this subtracts from the availability of others. The second, difficult exclusion of users, refers to the challenge of regulating the access to the (potential) urban development in the common spatial markets (*resource system*) in face of the municipal discretion in making use of their authority over local land use allocation.

Based on this conceptualisation of TOD as CPR it was hypothesized in chapter 2.3.1 that the combination of geographical competition over households and businesses and the fear of free-riding municipalities (those who do not restrict land use in accordance with TOD) creates an incentive for self-interested, rational municipalities to not (fully) comply with the coordination of TOD themselves either. The degree to which this individual rationality for non-compliance with the common interest will show depends on the institutional configuration of each case of TOD. These institutional arrangements for inter-municipal coordination of land use and transport were systematically analysed by means of the Design Principles for CPR (chapter 5.2)

6.2 VALIDITY OF THE CPR-FRAMEWORK

The conceptualisation of TOD as a CPR proves to be a valid analytical perspective in all three cases of TOD implementation. Despite the different contexts and phases (chapter 3) the cross-case analysis (chapter 5.2) shows that the hypothesized individual rationality of municipalities for not (fully) complying with the common interest of TOD can be traced in every single case. It explains the - potential - collectively irrational outcomes of inter-municipal coordination in the implementation of TOD (also see chapter 5.1).

6.2.2 CHARACTERISTICS OF A CPR

Geographical competition over a share of households and – in particular – businesses proves to be a strong incentive among most of the municipalities. In order to strengthen their relative competitiveness, municipalities attempt to create and sustain a sufficient supply of land use capacity. From the perspective of the TOD implementation to which most municipalities (implicitly) committed too, this supply of land uses is inferior. In the Dutch cases the large supply of greenfield locations is counterproductive to TOD as it impedes the development of the more expensive and complex station locations (chapter 4.1 & 4.2). In Copenhagen land use supply concentrates at station locations, but the overemphasis on commercial over residential development creates a potential misbalance in the urban development (chapter 4.3). In all three instances of TOD municipalities select a strategy based on an assessment of the costs and benefits of compliance to the coordination of TOD (chapter 5.2.2). In that assessment municipalities are aware of the relative disadvantage in geographical competitiveness that they may incur through compliance with the coordination of TOD when others do not (fully) comply. For any restrictions in land use equals to less variety in supply of locations, which may damage the ability to attract households and businesses compared to municipalities that do not equally restrict land use. Without having to share in the costs of restriction, these non-complying municipalities do share in the collective benefits of TOD (e.g. improved urban regional accessibility and competitiveness). These free-riders however also disproportionately increase their competitive position in the inter-municipal competition. They can – through the supply of a larger variety of locations – subtract a relatively larger share of households and businesses. These considerations highlight how elements of high-subtractability and difficult exclusion play a role in the implementation of TOD, like the conceptualisation presumed.

6.2.3 THE VALUE OF THE DESIGN PRINCIPLES

In chapter 2.3.2 it was argued how the Design Principles for CPR could be used to analyse the coordination of TOD. It presumes that the degree to which municipalities show geographical competition over urban development (high subtractability) and (fear of) free-riding behaviour (difficult exclusion) can be understood by the nature of the institutional configuration of the coordination. The Design Principles prove to be an analytical perspective for understanding what institutions are functioning, malfunctioning and missing in the regional TOD strategies. The overview in table 13 shows the how the institutional arrangements show some similarities and differences in the relative strength of the institutional configurations (see chapter 5.2 for the full discussion).

Table 18: An assessment of the institutional arrangements for inter-municipal coordination across three cases of TOD

CHAPTER	DESIGN PRINCIPLE (DP)	STEDENBAAN	ZAANCORRIDOR	LOOP CITY
5.2.1	Well-defined boundaries	+/-	+/-	+
5.2.2	Proportional equivalence between benefits and costs	-	-	+/-
5.2.3	Collective-choice arrangements	-	+/-	+/-
5.2.4	Monitoring	+/-	-	-
5.2.5	Graduated sanctions	+/-	-	-
5.2.6	Conflict-resolution mechanisms	+/-	-	-
5.2.7	Minimal recognition of rights to organize	+	-	+/-
5.2.8	Nested enterprises	+	-	+/-

QUALIFICATION	SYMBOL
Missing institutions	-
Presence of institutions	+/-
Functioning institutions	+

In the most general sense the overview makes clear how the inherent propensity for municipalities to deviate from implementation of TOD is insufficiently countered by (categories of) institutions that encourage commitment.

As longest-standing case, Stedenbaan has developed the most elaborate institutional arrangements. Its strength lies in its well established position in the wider institutional context (DP 7), comprehensive (polycentric) structure (DP 8) and the presence of a fully-fledged monitoring mechanism (DP4). These types of institutions are less developed in the other two cases. Whilst the comprehensive delineation of Stedenbaan has many theoretical benefits (DP 1), the lack of adequate representation of municipalities (DP 3) and the absence of an equalization mechanism between costs and benefits (DP 2) undermines the commitment to the otherwise quite established coordination in practice at the local level.

Almost the reverse is the case in Loop City. The monitoring, sanctioning and conflict-resolution mechanisms (DP 4, 5 & 6) are largely absent due to the fact that there is no culture for inter-municipal land use coordination in the Danish governance (DP 8). The starting position of Loop City is however fundamentally better. Compared to the Dutch cases, the boundaries to the TOD strategy are well-defined (DP 1): clear delineation in terms of membership (Ringby municipalities at the Ring 3 light rail) and geographical location (relatively more homogeneous suburban area in Greater Copenhagen) are present. Together with a mechanism that implicitly relates the costs of the light rail to the potential land use benefits (DP 2) and TOD-supportive planning principles (DP 8), municipalities have a stronger incentive for land use development at station locations from the outset. In absence of the additional institutions for coordination the CPR situation is narrowed down to these locations, but the issue of inter-municipal competition is not solved (chapter 6.2.2).

The institutional configuration of the Zaancorridor shows potential due to the collective choice arrangement (DP3), which allow for direct municipal influence on the creation of coordination. For the moment however the commitment is frail as many of the institutions for coordination have yet to be developed and related to the wider institutional context.

6.3 CONCLUSION

This research aims to explore how competition between municipalities affects the implementation of TOD. For that purpose the following central research question was formulated:

How can the CPR-framework help understand the role of inter-municipal competition in the implementation of TOD?

The CPR-framework forms an analytical perspective on the implementation of TOD that explicitly incorporates geographical competition among municipalities. It proves to be a valid perspective for understanding how implementation of TOD may fail even though municipalities endorse the common interest of inter-municipal coordination of land use and transport. In face of geographical competition municipalities can make the rational, self-interested decision not to (fully) commit to the coordination of land use that would bring about the collective benefits of TOD. This strategic behaviour of municipalities is triggered by a combination of high individual costs of losing (or missing out on) a share of households and businesses that could follow from restrictive land use policies and the fear that other municipalities may not comply with the land use restrictions. These potential free-riders may share in the collective benefits of TOD-based development patterns and simultaneously gain a relative advantage in the geographical competition through the larger variety of locations they can offer.

The Design Principles that were used in the analytical framework help understand how the inherent propensity for municipalities to deviate from implementation of TOD can logically exist. It more specifically indicates how (in)adequate or missing (categories of) institutions are jointly responsible for the (lack of) commitment among municipalities to the implementation of TOD. As such the CPR-framework proves to be an analytical tool for systematically assessing the strengths and weaknesses of institutional configurations of TOD whilst still accounting for the variances in context and phase.

7. REFLECTION

In this chapter a reflection on the process and the outcomes of this research is provided. In chapter 7.1 the relevance of the academic (theoretical) and societal (practical) relevance of the thesis is discussed. Transparency about the limitations of the CPR-framework is created in chapter 7.2. This is followed by a number of recommendations for future research and application in chapter 7.3.

7.1 RELEVANCE OF THE RESEARCH

7.1.1 ACADEMIC RELEVANCE

The CPR-framework can be of value in practical and theoretical discussions on TOD. It proved to be a sound explanation for the discrepancy between the common interests of coordination and the lack of implementation of TOD. The combination of theories from different disciplines helped to explicitly include geographical competition into the theorizing over TOD. It clarifies how the 'impeding effects' of competition come about (chapter 2.1.5). In particular it shows how the individual rationality of municipalities can differ depending on the institutional arrangements that are in place in a given context. By an analysis based on the Design Principles, the relative strength of these institutional arrangements can be systematically assessed and the implications for the TOD coordination can be estimated. In that regard the CPR-framework forms a new line of thinking about coordination of land use and transport among municipalities. The framework offers plenty of opportunities for further theoretical development (chapter 7.2).

7.1.2 SOCIETAL RELEVANCE

Although the chief purpose of the research was to make a theoretical contribution to TOD, there is a clear practical value in the CPR-framework. It warns against the optimism in the practise of TOD: the idea that an urban development strategy or vision that shows the benefits of TOD suffices to make municipalities coordinate land use (and transport). In its current – rudimentary – form, the CPR-framework does not provide a checklist or series of steps to improve coordination of TOD directly. Perhaps that is not even possible as the Design Principle by definition need to be kept general to flexibly deal with context-specific institutional settings (McGinnis, 2011). However the cases in this research show that the Design Principles can be used to pin-point particular strengths and weaknesses in the institutional arrangement for coordination between municipalities (chapter 5). For existing cases of coordinated TOD, the CPR-framework can function as a mirror. It can show for example how monitoring or sanctioning mechanisms are not developed (sufficiently) and may be responsible for potential commitment problems of municipalities. In case of a new instance of regionally coordinated TOD, it can be used to carefully determine 'boundaries' in terms of the project area and selection of municipalities. It provides clues for discovering how the individual benefits of TOD weight against the potential costs of coordination. All these issues are hardly directly practical, but can serve as an inspiration to fundamentally improve the chances for successful implementation of TOD. It is no success-formula for the institutional design of TOD, like there is no blue-print for physically establishing TOD. That however does not make the Design principles less valuable. Similar to how the 3D's (density, diversity, design) are valuable dimensions in the physical implementation of TOD, the Design Principles can likewise be of value in improving its institutional design.

The understanding that the CPR-framework creates about implementation of TOD can be used to improve the efficiency in multi-level governance. The individual rationality that was detected among municipalities can result in high social costs over the long-term. These are the missed opportunities of TOD in terms of sustainability and economic competitiveness (chapter 2.1.1). Examples that showed up in the case study include new greenfield development in the Netherlands that does not fit future demand, the costs of disappointing returns of the Ring 3 Light Rail in 2059 for Ringby municipalities or the cancelling the surplus of

development plans for businesses at along the Loop City. These outcomes can potentially damage welfare at various levels. Municipalities may over a long period of time regret the short-term decision they make and the externalization of costs that is connected with that (chapter 2.1.5).

7.1.3. RELEVANCE FOR WITTEVEEN+BOS

The CPR-framework can be used by Witteveen+Bos to broaden the understanding about the coordination of TOD. It can help to relate better to the issues that are felt by (local) authorities, private developers, railway companies and other clients with regard to the implementation of TOD. The knowledge about institutional processes can complement the 'technical' knowledge that is already embedded in this multifaceted engineering consultancy. This creates the opportunity for Witteveen+Bos to engage into integrative land use and transportation projects. Ultimately this can help create a position in new markets and offer a more well-rounded set of activities and services. Since the Netherlands is the most important market for Witteveen+Bos, the assessment of the Stedenbaan and Zaancorridor (Appendices V and VI) in particular can provide details and offer a background to assignments that may arise in the Dutch context of TOD.

7.2 LIMITATIONS OF THE RESEARCH

The choices that were made to come to the CPR-framework were accounted for at various points during the research. It is important here to highlight some of the limitations that the analytical framework has.

7.2.1 NARROW FOCUS ON MUNICIPALITIES AND LAND USE

The framework aimed to be a comprehensive model for understanding land use coordination between municipalities in TOD. This created the necessary focus for answering the research question on geographical competition as unexplored factor in TOD. At the same time it leaves other aspects largely out of the picture: the influence of transport systems and human socio-cultural and economic preferences (chapter 2.1.2) as well as the dynamics between other actors in TOD (chapter 2.1.4). It is important to keep acknowledging the influence of these factors that together are likely to have a much bigger effect on the course of TOD than municipal land use decisions alone. It would require an almost technocratic perspective to assume that the allocation of land use capacity equals increasing densities and diversity at station areas. The reality is that there is a logical, but much more diffuse and indirect link between the demand, allocation of land use, actual densification and diversification and success of TOD (chapter 2.1.2).

In the case study this limitation proved to be true. There are many other dynamics at work in the different cases of TOD (chapter 4). Some of these could be incorporated into the CPR-framework. For example the tradition among Dutch municipalities to engage into greenfield development, which creates lasting incentives for development at those locations. This was linked to the aspect 'costs' under Design Principle 2 (chapter 5.2.2). Many other influential processes were however did not fit equally well in the CPR-framework or may be missed altogether. The environmental safety constraint such as in Dordrecht¹⁴ is a major factor that could however not be integrated well into the institutional framework in this research.

7.2.2 COMPLEX AND ABSTRACT NATURE OF TOD

Related to the previous side note is the fact that TOD is a relatively complex and abstract 'resource' to conceptualise. Chapter 2.1 gives witness of the multi-layered physical and institutional character of TOD. Many of the institutional theories used for creating the framework have been established based on relatively simple, small-scale CPR situations, such as inshore fisheries, smaller grazing areas, groundwater basins, irrigation system and communal forests. The resources involved are very tangible and one-dimensional, in

¹⁴ Indicated by Van der Hout et al. (2015)

contrast to TOD. This in itself is no objection for applying institutional theories to TOD, for the IAD/SES and elements like the Design Principles are specifically designed to facilitate systematic analysis of the most diverse range of institutional configurations (McGinnis, 2011). These can be equally, if not more abstract than TOD: international trading arbitration and international banking regulation (Ostrom, 2012) or the performance of housing condominiums (Choe, 1992, in Ostrom, 2005) and comparison of different types of day-care centres (Bushouse, 1999, in Ostrom, 2005). This makes this institutional approach to TOD valid, but does warn against oversimplification of TOD in referring to the CPRs used to develop these theories.

7.2.3 MEASURING IMPLEMENTATION

The implementation of TOD proved to be a difficult concept to make measurable (chapter 2.3.2). Especially since this research involved cases in which the implementation could not be evaluated ex post as all three cases are still developing (chapter 5.1). Instead of an 'objective' quantitative (statistical) comparable assessment implementation was measured by comparing the future implementation (prognosis) to the 'subjective' ambitions that form the basis for inter-municipal coordination. This suffices as indicator for the outcomes of the coordination and as starting point for analysis of the institutional arrangements.

7.2.4 INDIVIDUAL USERS VERSUS CORPORATE ACTORS

It is important to note that municipalities (and many other actors in TOD) are corporate actors. The actor does not function as a single individual (like for example a herder or fisherman), but rather as a group of individuals contained in an organization. This is no objection in studying these actors, but it requires awareness that the acting of the individual may not always align with the organization that he represents (Ostrom, 2011). In case of a municipality there is obvious a large distinction between (party-) political representatives and the civil servants (see chapter 7.3)

7.2.5. OTHER BARRIERS TO TOD IMPLEMENTATION

From the outset of the research there was grounded reason to believe that geographical competition is a major barrier to the implementation of TOD (chapter 2.1.5). The empirical data support the validity of this assertion (chapter 6). However many other (institutional) barriers are known to be in place to the implementation of TOD (chapter 2.1.4). The CPR-framework does not provide a comprehensive explanation for all of those barriers per se (chapter 7.2.1).

7.3 RECOMMENDATIONS FOR FUTURE RESEARCH

7.3.1 EXPAND THE TESTING OF THE CPR-FRAMEWORK

The CPR-framework is – as argued before – rudimentary in its nature. The research design made sure that the validity of the conceptualisations was asserted in various contexts and at various stages of the process (chapter 3). Still this research was limited to three European cases of which two in the Netherlands. It is advisable to expand the testing of the CPR-framework to a larger set of cases of TOD to see whether the conceptualisation holds up and research how the Design Principles can be further operationalised in the process (chapter 2.3.2).

7.3.2 INVOLVE OTHER ACTORS

It is recommendable to incorporate a larger set of actors into future research (see table 5). A first step is to complete the understanding of the municipality as a corporate actor (chapter 7.2.3). It is advisable to involve local administrators into future research since their perspective on the coordination of TOD may differ from that of the public servants (the main source in this research). Politicians engage first-hand into the discussion and deliberations among authorities. Their information could shed more light on the informal institutions for sanctioning and conflict-resolutions, that were difficult to fathom (chapter 5.2.5 and 5.2.6). Their cost-benefit analysis could moreover be different from that of an official, due to political accountability (chapter 5.2.2)

7.3.3 MAKE USE OF COMPLEXITY THEORY

The CPR-framework could be regarded as an attempt to create a holistic perspective on the coordination of TOD. When the recommendations above are followed, more factors could be incorporated into this framework. It may however well be a (reductionist) illusion to attempt to fully map all the interactions in the overlapping (sub)systems that comprise TOD. For a more holistic perspective on TOD complexity theory may prove an alternative approach.

7.3.4 RELATE THE CPR-FRAMEWORK TO EXISTING THEORIES

The insights that are derived through the CPR-framework can complement much of the systematic institutional approaches to TOD implementation that exist and vice versa. In chapter 2.1.4 examples of such studies are presented (e.g. Thomas and Bertolini, 2014 and Tan et al., 2014). The CPR-framework can furthermore encourage further usage of institutional theories to elucidate TOD.

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