

# **Innovation District Development in Dutch practice**

an exploration on the role of the built environment with recommendations on role-taking  
by local public authorities in innovation district development: the Case of the Merwe-  
Vierhavens & RDM – as part of the CityPorts project.

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Colophon

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## PERSONAL NOTE

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I started studying at the faculty of Architecture with the ambition of becoming an architect. During the last 4 years my interest in the built environment shifted focus from designing towards planning and management. It brought me closer to practice and showed me that you can be creative in so many more ways. My journey in Delft has continued in Rotterdam and brought me somehow to where I am now. The thesis you are about to read will bring me to the end of this journey as a student.

This report presents the findings on my graduation research in the domain of urban area development within the graduation lab of Sustainable Private Sector-led Urban Development. This research has taken place at the department of Management in the Built Environment at the faculty of Architecture at the TU Delft situated in the Netherlands.

With this report I hope to enrich our academic field of urban development management with a grasp of knowledge and findings on a topic that stole my interest during my internship at the Rotterdam Port authority N.V. – namely, *Innovation District development*. I worked in close collaboration with the municipality of Rotterdam, under the wings of Stadshavens Rotterdam on several projects in the Merwe-Vierhavens. An area marked by its former industrial functions, still present port activities, iconic architectural heritage, and by its creative and entrepreneurial pioneers spread throughout the area.

This area reflects a contemporary urban development project which gained renewed attention with the launch of the Rotterdam Innovation District in November 2015. Ever since Stadshavens is facing the development of the Rotterdam Innovation District which makes Port authority N.V. and the municipality of Rotterdam rethink and redefine their CityPorts alliance; demanding a renewed and specified implementation strategy; and asking for spatial conditions and interventions meeting the innovation district propositions.

To build knowledge on the roles local public authorities can deploy in innovation district planning and development and the spatial conditions and interventions they should enhance in the context of this specific critical case and in general, this research will explore innovation district development strategies that may be of use in Dutch urban practice.

Before reading I would like to thank everyone who has contributed to this research so far. Especially, all my interviewees for sharing their knowledge and ideas, Tom Daamen and Alexandra den Heijer for their guidance and Rik Dalmeijer, Maike Akkers, and Isabelle Vries for the opportunity to carry out this research under the wings of the Rotterdam Port authority N.V. and Stadshavens Rotterdam.

Marissa van der Veer  
Rotterdam, 2017

## DEAR READER

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This graduation research can be of interest to local public authorities that are thinking of planning for an innovation district or facing difficulties in bringing their innovation district initiative into development. Besides that this study aims to inspire urban planners, urban designers, and urban policymakers to plan for innovative and inspiring urban environments as this research explores the physicality of innovation and spatial conditions stimulating the processes leading to it.

Accordingly, this research explores the roles local public authorities can deploy in innovation district planning and development and the spatial conditions they should enhance to stimulate innovation through the built environment. Given the fact that cities are focussing investment and promotion on new locations where the knowledge economy might concentrate, to create areas that raise their innovation profile and accelerate urban economic renewal. While academics and practitioners question to what extent these projects can be successfully initiated and activated from top-down, knowing that local public authorities are no longer in the lead when it comes to large scale urban (re-)developments projects.

Therefore this graduation thesis explores the following question:

***How can local public authorities plan for and subsequently develop innovation districts that deliver on the objective of stimulating innovation through the built environment?***

Accordingly this study builds knowledge on how an effective planning approach may help initiate and activate innovation district development projects in combination with an exploration on the ways the built environment can raise the innovation profile of an urban area through urban form and spatial conditions.

To execute this graduation project and present an understanding on innovation district development in Dutch urban practice, an in-depth case analysis on the Rotterdam Innovation District is conducted parallel to a literature study on innovation in relation to the built environment. In this way practical knowledge is build and theory is tested. These findings are translated into a synthesis linking theory to practice in which conclusions and recommendations are given on Innovation District development in Dutch practice.



## SUMMARY

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*The object of study* - This research explores the roles local public authorities can deploy in innovation district planning and development and the spatial conditions and interventions they should enhance to stimulate innovation through the built environment. This research topic has derived from a fascination obtained during my internship at the Rotterdam Port Authority N.V. on the phenomenon 'innovation district' in relation to the urban redevelopment project of the Merwe-Vierhavens. This specific case reflects a contemporary urban redevelopment project where economic development objectives – aiming to raise the innovation profile of a distinct urban area, meet with ambitions in favour of accelerating urban renewal.

With this research I hope to build an understanding on the ways local public authorities can contribute to innovation district developments while adding value to a project in which innovation is actually stimulated. Because, to agglomerate knowledge-intensive activities on a specific location, cities are promoting and investing in new locations where these activities might concentrate, to raise the innovation profile of the area and accelerate urban economic renewal. Academics and practitioners question to what extent urban planners can appoint areas where innovation-rich activities might cluster; to what extent they contribute to what is already happening around the region and the city; and what strategies and organization these projects need to become more than a rebranding effort. This trend, promoting innovation districts as urban policy to foster economic growth, also becomes apparent in Dutch urban practice. Which drives this research to explore how innovation districts came into being, to what extent innovation is actually stimulated in these districts, and how they could be organized to enable and stimulate innovation and the processes leading to it. By focussing on the physicality of this phenomenon, the role of the built environment to stimulate innovation is explored.

As local public authorities are no longer in the lead when it comes to large scale urban redevelopments, they are forced to rethink their role in urban development projects and have to come up with new ways of collaboration to organize projects like innovation districts. Therefore the case selected is not only reflecting an innovation district development, but also a large scale urban redevelopment project in which both public as private actors are involved to bring the project into realization, namely the Rotterdam Innovation District.

The changing role of local public authorities in urban area development and the lack of scientific understanding on the concept of innovation district development in the field of urban development management, makes this object of study in need for both theoretical and practical insights. To provide that deeper understanding on innovation district development, both in process (how to develop) as in project outcome (what to develop), several components of existing theories, in combination with an in-depth case study to reflect on these theories, is used to answer the main research question.

Given the fact that innovation districts have emerged in several European and American cities as urban policy to foster economic growth, the concept became a popular tool to assess to what extent a distinct urban area accommodates knowledge-intensive and innovation-rich activities and if, besides the presence of companies, knowledge institutions, and residents, collaborations or interactions occur in favour of knowledge creation and subsequently, produce innovative output. This assessment also evaluates the urban area in terms of the availability and attractivity of the place. In this way the concept is used to not only relabel a certain area but also to allocate development opportunities and challenges derived from what is already present.

This is making innovation district developments embedded in local planning processes and highly influenced by the socio-economic and institutional characteristics of the place in which they are developed. Therefore, an exploratory research on the planning and development processes driving the Rotterdam Innovation District is chosen to answer the main research question of this project: 'How can local public authorities plan for and subsequently develop innovation districts that deliver on the objective of stimulating innovation through the built environment?'

This question is twofold:

1. What roles performed by local public authorities in innovation district planning, help develop an innovation district that stimulates (the processes leading to) innovation?
2. What spatial conditions and physical interventions help develop an innovation district that stimulates (the processes leading to) innovation?

*Methodology* - This research aims to answer these two research questions which are formulated to structure this exploration and specify the objective of study. Subsequently, this research is conducted by following four research steps – 1) an exploration and introduction of the research topic to narrow down the object of study, 2) theory building on the relation between innovation and the built environment and on innovation district planning and development, 3) a case analysis on the Rotterdam Innovation District to test findings from theory, and 4) a synthesis in which the main research question is answered and conclusions and recommendations are formulated while ending with a reflection on the product and the process of this research.

In all steps literature is reviewed and semi-structured interviews are carried out. Both used to provide knowledge and evaluate findings. Accordingly, theoretical and empirical findings are translated into conclusions and recommendations of practical nature, directed to the project team responsible for redeveloping the Rotterdam Innovation District as in general to add knowledge to the field of urban development management.

*Key findings* - In theory innovation districts are promoted for the ways they intent to facilitate knowledge spillovers; attract human capital; and facilitate idea generation, knowledge creation, application and accordingly the commercialization into inventions and innovations. These districts envision a high quality of life. Integrating work, living, and leisure through a diverse urban setting close to or within the vibrant daily urban systems of the city. Besides, in these environments collaborations and interactions between knowledge institutions, public authorities, the private sector and civic society are enhanced to overcome organisational or sectorial limits, stimulated through the multiple possibilities to meet and allowing crossovers to happen – in favour of open innovation. In practice however, urban development projects get labelled as innovation district without meeting this definition. Not all physical prerequisites to facilitate and stimulate open innovation seem in place and much needs to be improved. Nevertheless, it must be acknowledged that there is not one clear blueprint for an 'optimal' integration of innovation and space.

To provide an understanding on how spatial conditions and physical interventions can be improved to stimulate innovation at the urban district level the role of the built environment is conceptualized. But first, to overcome the risk of polarizing innovative have and have-nots, a definition on innovation is built. Stressing the fact that the definition on innovation is perceived in different ways, both in theory as by the interviewees questioned throughout this research.



Some would address innovation mainly as economic output of inventions and improved or new products, while others emphasize innovation as the process of knowledge creation, diffusion and application. In the context of the Rotterdam Innovation District propositions innovation is mainly communicated as a commercial concept in which the ability to improve the innovation profile of a distinct urban area, relies on the presence of organisations and individuals that can successfully exploit knowledge in commercial terms through innovative capacity and economic output.

However, as the processes leading to innovation are equally important and seem to rely on attracting and retaining high-skilled people but also on the ability to support the collaborative processes that may spur innovation, development strategies should incorporate not only spatial conditions stimulating innovation directly by accommodating innovators and knowledge-intensive activities. These strategies should also incorporate spatial conditions that enhance the processes leading to innovation stimulating idea generation, knowledge creation, diffusion, application and commercialization. In this respect the built environment can be deployed in innovation district developments more strategic as:

- A facilitator accommodating knowledge-intensive and innovation-rich activities through spatial concentration, flexibility and adaptability of urban form and the availability of place.
- An enabler of knowledge spillovers through proximity within a supportive environment allowing and stimulating open innovation through accessibility, connectivity, and community sense.
- An influencer of the density of social interactions leading to face-to-face contact and accordingly knowledge diffusion through an urban setting defined by its diversity, density and level of urbanity and vibrancy.
- A catalyst to attract human capital and create critical mass for further developments through a high quality of life shaped by the attractiveness of place, identity, authenticity, and district branding.

In line with these findings the built environment should at least reflect a diverse urban setting comprising a sense of community, well connected to the city, with a strong inspiring identity, open and mixed in use from building to area level to stimulate innovation at the urban district level.

A returning notion in theory is the collaborative nature of innovation and the importance of organizing these processes collectively as well. Assuming that the capacity to innovate depends on triple (industry-knowledge institutions-government) and quadruple helix (industry-knowledge institutions-government-civic society) interactions. This however, becomes apparent mainly in innovation cluster built around knowledge institutions focussing on the processes of knowledge creation and application rather than in economic clusters driven by the commercialization of knowledge. Accordingly, it can be questioned to what extent collaborative planning provides a more effective development approach in relation to the more laissez-faire approach in which the assumption is made that industry-university collaborations will foster innovation. Nevertheless, it can be stated that when top-down initiated innovation district developments, completely rely on the private sector in realising the innovation district ambitions, it becomes challenging to safeguard public interests and deploy the built environment to stimulate innovation more strategic. Especially when critical mass is yet lacking. Because, the spatial conditions that can spur innovation defined previously, ask for (pre-)investments in spatial quality, public space, and tactical urbanism in combination with the provision of public amenities.

To mitigate the risk of planning for an innovation district that will get neglected by both the envisioned end-users and by investors and developers, local public authorities should build strategies on:

- the availability, flexibility and adaptability of space to accommodate and facilitate knowledge-intensive and innovation-rich activities;
- supporting image and district identity to attract visitors and the envisioned end-users (e.g. companies, knowledge institutions and residents).

- on program (e.g. type of neighbourhood supporting and public facilities) to enable amenities that increase the diversity of people and enhances the density of social interactions.
- on urban lay-out (e.g. density and diversity), and public space (e.g. attractiveness, accessibility, and connectivity) to create vibrancy and community sense.
- on physical nodes (e.g. meeting points, shared and flexible workspaces) to enable knowledge spillovers that take place through the advantages of proximity.

In addition, despite the variation in organisation structures that occur in innovation-rich developments, local public authorities have clear roles to deploy as public entity, as well as initiator or driver of innovation district developments. They are able to not only shape and regulate the decision environment of urban developments, but also have a facilitating role to enhance and safeguard a pleasant working and living environment. These more traditional roles of shaping, regulating and facilitating urban development projects through development propositions, zoning plans and sharing information and expertise, have to be complemented with an envisioning and entrepreneurial attitude to plan for and subsequently develop an innovation district.

Because, from this exploratory research can be concluded, that in terms of effective roles to be deployed by local public authorities, they are obliged with a design task demanding an envisioning role when initiating the innovation district propositions. These propositions have to comprise tangible development plans to create public support, built commitment of stakeholders, and mitigate the risk of neglect by the envisioned and present end-users, when defining the project scope.

Accordingly, to bring the project into realisation local public authorities are facing a development task which demands an entrepreneurial role to activate the project. However, traditional local public authorities may not have the expertise to develop an innovation-rich environment or lack capital both in financial means to invest as in real estate and land to activate. To make sure momentum is not lost after initiating the innovation district and to allow a gradual redevelopment to spread risks and investments, a pro-active incremental development approach can be an effective approach to bring the innovation district into realization. In order to deploy this approach local public authorities have to:

- 1) allow (small scale) private-led developments;
- 2) leave room for bottom-up initiatives;
- 3) open up to partner in entrepreneurial public-private partnerships;
- 4) and deploy publicly owned real estate and land when available, to set an example and catalyse further developments.

To safeguard public interest in favour of an environment that spurs innovation, smart public policies and a flexible institutional framework are of essence. In this view, local public authorities can think about the coordination of public land uses stimulating face-to-face contact and building rights incentives when projects contribute to the attractiveness of place or when innovation-rich activities and public amenities are realized. Besides that, planning processes can be speeded up and flexible legislations provided towards favourable activities. In this way local public authorities can, besides deploying a more entrepreneurial role, take a facilitating role reflecting a refinement of the management task local public authorities are accountable for. Subsequently, local public authorities can become enablers and connectors to accommodate new activities and nurture the already present initiatives within the innovation district community. This may demand a shift in expertise, work load or even demand new type of business and program managers (e.g. community, innovation). On the other hand, it can help unburdening the companies, knowledge institutions, and entrepreneurs of importance to the realisation of the innovation district and may attract new activities that benefit the overall development.

In line with these findings local public authorities can take: a visionary role when initiating the innovation district propositions comprising tangible development plans. Which are followed by a proactive incremental development approach that allows small scale private-led developments and entrepreneurial public-private partnerships to activate the district and catalyse developments. While they safeguard public interest concerning the quality of life and redistribution of collective benefits through strategic use of both soft as hard management measures.

Nevertheless, when planning for an innovation district, local public authorities have to be realistic. A solution can be sought in the findings presented in this research. However, when exploring effective roles to be deployed by local public authorities in innovation district developments (especially when the concept is used to accelerate the redevelopment of an unproductive urban area) it must be acknowledged that these project are highly complex-dependent and demand tailor-made development strategies. Because these projects can have 1) a large and complex project scope; 2) a long term project time span; 3) the involvement of multiple stakeholders; 4) and interlocked and context-dependent planning challenges. These challenges are related to the effort needed to change the identity of the district. Because, these areas appointed as innovation district may include activities that do not match the innovation district vision and hamper future developments. Besides, these challenges can entail difficulties concerning a shift in expertise, competences, and further role-taking these projects demand from its management and organisation. And thirdly, these projects can be influenced by local politics or decisive stakeholders that pressure the project planning or make the allocation of venture capital difficult. While the financial implications for accelerating urban renewal are unavoidable.

Each innovation district development deals with challenges regarding the resources they can deploy, the planning tools they intent to use to steer the project, the avenues for growth envisioned and the present market demand, in relation to the level of public support and commitment created for the project in combination with the availability of space. As there are no clear blueprints for an 'optimal' urban form, there is not one solution for building an innovation district development strategy to overcome the risk of planning for an innovation district only in name.

However, the guidelines presented in this exploration can be used to evaluate the ability to stimulate innovation through the built environment and define a more effective planning and development approach to realize an innovation-rich environment.

## READERS GUIDE

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This report is defined into four parts:

### *Part 1 Research introduction*

Part 1 comprises two chapters. In this first chapter an introduction on the research topic is given by elaborating on the background, motivation and relevance of this research project. The second chapter will present the research design by explaining the methodology chosen. Followed by an explanation on the methods used for data collection to answer the research questions introduced in chapter one.

### *Part 2 Theoretical part*

Part 2 entails the theoretical part of this research based on desk research and exploratory interviews to acquire knowledge on several aspects related to the research topic presented in part one and leading to an analysis framework to conduct the research proposed in the research introduction. These chapters form the basis for the empirical case study analysis constructed to answer the main research question central in this graduation project.

### *Part 3 Case analysis*

Part 3 provides the case description and empirical findings derived from the empirical part of this study in which the Rotterdam Innovation District is analysed.

### *Part 4 Conclusions and recommendations*

Part 4 provides a synthesis of theoretical findings and practical knowledge build through the empirical case analysis. These will be followed by conclusions that aim to answer the main research question and builds recommendations for local public authorities on innovation district development strategies. In addition, this part will, based on the findings from theory, planning examples and case study research, result in a synthesis and accordingly an extension on existing theory. To conclude this research, a personal reflection on the process and final project can be found in the final chapter.

*you don't write because you want to say something  
you write because you have something to say*

F. Scott Fitzgerald

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# **PART 1**

## **RESEARCH INTRODUCTION**

# CHAPTER 1

## BACKGROUND: studying Innovation Districts

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### INTRODUCTION

#### 1.1.1 A new urban model named ‘innovation districts’

Planned  
area-based  
initiatives

Innovation is becoming a very popular concept and is seen as a solution for many economic, spatial and social matters. Accordingly, cities are focussing investment and promotion on new locations where innovative activities may cluster and subsequently where the knowledge economy might concentrate, to agglomerate knowledge-intensive activities in a designated area and to create areas that raise their innovation profile (Van Winden, 2013; Clark, 2016). These planned area-based initiatives include the development of science and technology parks; innovation hubs and knowledge hotspots; but also university campuses and innovation districts (Van Winden, 2013; Katz & Wagner, 2014; Curvelo Magdaniel, 2016).

This last one, named innovation districts, emerged in urban planning as a way to strengthen the innovative capacity of a city while responding to a changing socio-economic context (Clark, 2010; Katz & Wagner, 2014; Morisson, 2015). The rise of this new urban model seems strongly driven by a changing socio-economic context. Because, most of the competitive advantage of countries and organizations relies on their ability of attracting and retaining talented people (Curvelo Magdaniel, 2016). Making decisive location factors dependent on the living and working conditions preferred by the highly-educated worker (Florida, 2010).

The work ethic behind the knowledge-intensive economy values passion, freedom, flexibility and recognition. Work has to be fun, meaningful and for oneself (Himanen, 2010). This, in combination with a deep-changing pattern in lifestyle and consumption, lead to a growing trend to favour urban living. Urban living is re-associated with status, sophistication, open-mindedness, and the undeniable hip-factor (Morisson, 2015). Accordingly, location preferences of individuals, companies, and institutions change (Katz & Wagner, 2014). Companies seem more attracted to cities as business location and become more location bounded, despite globalisation which provide companies the opportunity to become more footloose (Van De Klundert, 2008).

***‘Innovation lies at the heart of political debate in developed countries, to the extent that sustained competitiveness can only arise through the development of knowledge-intensive activities.’***

(Morisson, 2014)

Cities that are implementing innovation districts aim to attract companies and individuals not only through fiscal and economic incentives but by providing what innovative companies and young professionals want. Companies relocate to a certain city, for instance, to have access to talented ‘creative’ professionals; for institutional support through flexible legislation and supportive policies; enabling and facilitating governments and public institutions; the quality of life; or an overall improved innovative capacity (Morisson, 2014).

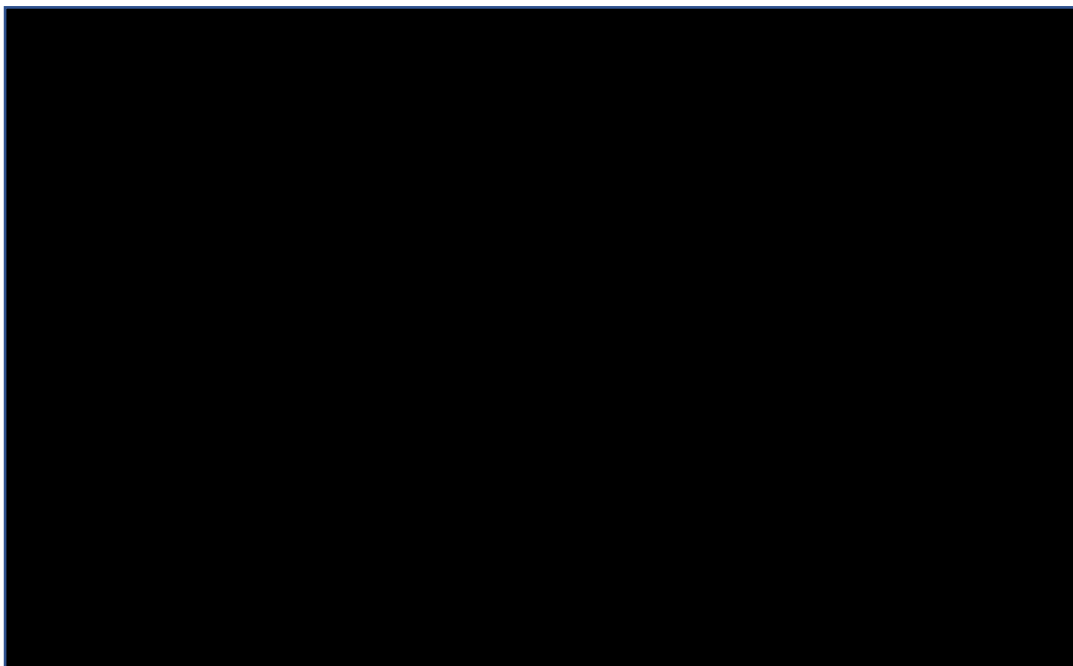
This economic change, towards a more knowledge-intensive economy, is happening because economic developments are subject to new productive conditions that are emerging from globalization and advances in ICT. These developments result in more knowledge-intensive activities of a highly localized nature and have already enhanced the innovative capacity of several cities (Castells, 1989; Sassen, 1994).

In respect to this, cities are facing a growing global competition and are becoming key players in a new economic order in which competition is based on knowledge creation, diffusion and application – referred to as innovative capacity. Cities are growing in importance as spatial and relational proximity<sup>1</sup> is enhanced in more urbanized environments, facilitating the complex processes of knowledge creation, combination and diffusion (Storper, 2004). Therefore, cities are getting reappreciated, growing in attractiveness, and challenged to keep up the competition, which ‘poses significant challenges for urban economic renewal’ (Carvalho & van Winden, 2017).

Innovative  
capacity

### 1.1.2 Problem field: Innovation Districts only in name

Innovation districts have proven to be effective solutions for cities to modernize their economies and pivot from traditional industrial-based production to technology-driven services (Glaeser & Kerr, 2009). In response, cities, regions and nations are planning innovation districts as a variation of best practices like the Boston Seaport project and 22@Barcelona. As a result, there are already over 80 ‘official’ innovation districts developments promoted worldwide (Talkington, 2014).



*Figure 1.1. Bottom-up emerged Innovation Districts.*

Some leading examples, categorized as innovation districts, emerged from bottom-up leadership or tell stories on companies and knowledge institutions that clustered more organically within the city – like Cambridge (Massachusetts), Silicon Alley (New York), Silicon Sentier NUMA (Paris), city centre of Amsterdam, and the I.D.E.A. district (San Diego).

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<sup>1</sup> **relational proximity**: is defined as the similarities of areas, in this context cities, in terms of shared behavioural codes, common culture, sense of belonging and cooperation capabilities shaping the capacity of a specific area to absorb knowledge spillovers and reinforcing the effects generated by geographical closeness – the ‘atmosphere effects’ or spatial proximity (Kourit, Nijkamp, & Stough, 2011).

These developments were achieved by more bottom-up spontaneous market forces with minimal formal planning (Katz & Wagner, 2014). On the other hand, the innovation districts of Barcelona (22@Barcelona) and Boston (Boston Seaport), can be seen as successful proven, top-down initiated public-private urban developments. Best practice examples like these resulted in a growing interest of cities all over the world to learn from these places and develop their own innovation district strategy to improve their local and regional innovation ecosystems<sup>2</sup> (Morisson, 2015).

*‘Over the last ten years innovation districts became a popular concept and a wide range of distinctive typologies and several levels of formal planning became disclosed.’*

(Katz & Wagner, 2014)

Ever since the successes of Barcelona and Boston became apparent, the concept of innovation districts has been applied to many European and American cities, promoted as urban policy fostering economic growth. However, these areas do not always meet up to their innovation district propositions nor do they deliver on the objective of enhancing the innovative capacity of their city or region.

According Massey (1992) and Maio (2015) too many knowledge-based developments are unable to deliver up to its promises and turned into ‘high-tech fantasies’ and pure real estate businesses (Carvalho & van Winden, 2017). In case of innovation districts, most often the concept was only used as a rebranding strategy for a rundown or unproductive neighbourhood (Morisson, 2015).

As Clark (2016) stresses, ‘amid all the current buzz around innovation districts, there is a need to understand the difference between aspirations and reality. Successful innovation districts are driven by larger trends than site availability, and are products of dynamic innovation ecosystems. Districts are not the drivers of such ecosystems. Even though they can be catalysts for such ecosystems to expand and deepen, a city does not become an innovation hub simply by promoting the establishment of an innovation district.’

Nevertheless an innovation district can be seen as a compelling concept to local authorities to implement it, or at least to debate the possibility of implementing it, in their respective cities (Morisson, 2014). Because, from the perspective of cities and regions these areas are seen as locations that can bring forth new economic growth paths; attract investment, talent and knowledge workers; improve a city’s image; and physically regenerate old city areas (Carvalho & van Winden, 2017).

### 1.1.3 Problem analysis: allocating the perfect place

Research points out that the knowledge-based economy operates through city and region innovation ecosystems and is emerging through mainly market forces instead of public policy and planning (Clark, Moonen, & Peek, 2016). Looking at existing innovation-rich areas, they all benefit from agglomeration advantages at the regional scale, like urban facilities, infrastructure and connectivity, matching employment possibilities, economic diversity, knowledge sharing and productivity (Lekkerkerker & Raspe, november 2016). These advantages could become key to economic growth when cities enhance its polycentric and metropolitan geographical lay-out. As mentioned by Meijers (2015) focusing on networks of smaller cities can make a region more competitive and balance the positive and negative effects of agglomeration forces in which cities can profit and complement one another.

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<sup>2</sup> **innovation ecosystem:** these systems model the dynamics of the complex relationships that are formed between actors or entities that enable innovation (Jackson, 2015).

In line with these findings (Clark, 2016) states that the part of Holland that comprises the metropolitan region of Rotterdam and Den Hague, Utrecht, and Amsterdam (occasionally including Eindhoven) provides several ingredients like economic scale, transport connectivity, knowledge economy, and R&D possibilities, which make it a highly connected global region but also a more flexible region on the long-term, due to its polycentric urban lay-out, in comparison to the monocentric regions of London and Paris. Therefore this region should be emerging as a serious global competitor in terms of economic output. However this has not been the innovation story upfront so far (Clark, 2016).

Looking beyond this high potential region, innovation clusters, campuses, valleys, deltas and hubs are popping up throughout the country telling its own innovation story promoted on a mainly local and regional scale, aiming for successes like Silicon Valley and initiated as showcases by aldermen to keep up the regional competition and to be taken into account when it comes to National and European funding (Andersen, 2016). According Ebbendink this national competition is partly caused by policies like the 'Topsectorenbeleid' in which nine sectors were defined as important to compete globally as 'Nederland B.V.'.

This resulted in a competition between regions to prove themselves within these specific sectors and fragmented economic developments. This shifting focus can be seen as a fixation on branding and image-building in which 'we try to copy-paste international best practices while ignoring actual lessons from extensive academic research' (Andersen, 2016). Clustering became an end in itself instead of focussing on actual economic growth.

Thus, focussing on individual districts within a city might be a catalytic way to spur innovation but only when this development is placed in the wider context of what is already happening around the region to define how a city or district can participate specifically and actively in the value chains of innovative sectors and companies that are already part of the regional framework. Besides that it must be acknowledged that there is not only one specific location suitable to spur innovation. There might be other places where innovation-rich areas emerge over time which are in general, not designated by urban planners in advance (Clark, Moonen, & Peek, 2016).

#### 1.1.4 Research context: a changing Dutch urban development practice

It may be questioned how this research topics fits the graduation lab of Sustainable Private Sector-led Urban Development projects in the master of Management in the Built Environment, at first sight. However, cities must continuously adapt to these new socio-economic demands and needs posed by the knowledge-based economy. Cities are in constant transformation asking for urban interventions that generally do not occur automatically (Verlaet & Wigmans, 2011). Urban management is needed to set a framework for urban developments in which planned urban interventions are coordinated and integrated through public as well as private actions, also in the case of innovation district development projects.

According to Heurkens (2012) cities in Europe and North America are facing a period of demand-driven urban developments in the light of a marginal economic growth, 'creating a 'new reality' that poses new requirements for the roles of public and private actors in urban development projects'. Two parallel urban practices become visible in this context. One that is based on top-down public-private urban projects and one that focuses on local bottom-up multidisciplinary urban 'collectives' (Robles-Duran, 2011).

In the Netherlands, the academic and professional domains related to urban development management have become spheres of structural reflection. Because, the recession has revealed that established ways of thinking and acting in urban development practice should be questioned. As a result, local authorities and private actors are adapting to new ways of collaboration in managing urban development projects which also poses new roles and responsibilities in innovation district development in Dutch urban practice.

Besides, 'Dutch urban development practice is characterized by a growing sense of ineffectiveness and inefficiency. It seems that established organizational, legal and financial arrangements used for urban projects no longer match shifting public-private relations and interactions' (Heurkens, 2012). In addition, while local authorities are exploring new ways of collaboration, management, and financing urban development projects 'the majority of partnerships in the Netherlands seem to cope with a weak inter-organizational capacity that is not capable of achieving added value, even if this value can be verified on paper' (Teisman, 2008).

As Innovation Districts are catching the attention of many municipal officials and the concept is often only used to rebrand a certain urban area, 'local authorities are in need for customized development strategies' to follow up the branding initiative of certain projects (Katz & Wagner, 2014). Because, when promoting an innovation district by allocating opportunities and building an innovation strategy a catalysing development is expected.

***'This new urban agenda regarded as 'Innovation districts' is calling for 'new urban development schemes embracing the city as the place for innovation.'***

(Curvelo Magdaniel, 2016)

As these districts differ in distinct economic strengths; size, urban form and density; avenues for growth; the extent of partnerships; and their level of geographic and institutional formality, initiators and developers have to be realistic (Katz & Wagner, 2014). These projects are in need for carefully planned interventions and specific roles and actions by public authorities, private actors and knowledge institutions (Morisson, 2014; Clark, 2016).

A strong collective effort seems essential to organize collective actions and manage resources to stimulate innovation at the area level (Lekkerkerker & Raspe, november 2016). The capacity to innovate accordingly depends on the collective effort of three or four organisational spheres namely knowledge institutions, the private sector, public authorities, and civic society – also known as the Triple and Quadruple Helix (Etzkowitz, 2008). However, existing knowledge on the relationships and interactions within these organisational spheres to organize collective actions and manage resources to stimulate innovation at the area level is limited (Curvelo Magdaniel, 2016). Besides, it must be acknowledged that not all cities are either well-endowed or ready to host innovation districts (Clark, Moonen, & Peek, 2016).

Triple Helix  
interactions

### 1.1.5 The problem definition: in need for new urban development schemes

There is an increasing socio-economic demand for the development of innovation districts aiming to raise the innovative profile of distinct areas within the city. Due to best practices the concept of innovation districts has been applied to many European and American cities, top-down initiated and promoted as urban policy fostering economic growth. Assuming that the planning system knows which location will become more innovation-rich than others. Unfortunately cities are either not all well-endowed nor do they all deliver on the objective of stimulating innovation at the urban district level.

As districts do not evolve and succeed just because city governments or landowners wish to have them. They require carefully planned interventions at different points in their development (Clark, Moonen, & Peek, 2016). In addition these projects ask for specific roles and actions by public authorities, private actors and knowledge institutions (Morisson, 2014; Clark, 2016). Unfortunately, existing knowledge on their relationships, resource management, and the organisation of collective actions and interactions is limited (Curvelo Magdaniel, 2016). It seems that these projects demand a strong collective effort. However, in Dutch urban development practice 'partners can have difficulties in joint decision-making and therefore tend to strictly separate responsibilities by contract' (Klijn & Teisman, 2003).

Accordingly, raising the innovation profile of distinct urban areas, in particularly through innovation districts, has been a topic mainly investigated in agglomeration economies on the 'externalities recognised to play a major role in the process of knowledge creation and diffusion' and in the field of economic geography on the role of proximity in stimulating innovation (Curvelo Magdaniel, 2016). However, the capacity of these distinct urban areas to support innovation ecosystems and stimulate innovation ask for specific interventions and organisation on which a scientific understanding is yet limited.



# 1.2 EXPLORING THE ROTTERDAM INNOVATION DISTRICT

## 1.2.1 Personal motivation

This research topic – Innovation District development in Dutch urban practice, has derived from a fascination obtained during my internship at the Rotterdam Port Authority N.V. on the phenomenon ‘innovation district’ in relation to the urban redevelopment project of the Merwe-Vierhavens. This specific case reflects an contemporary urban development project where economic propositions, aiming to raise the innovation profile of a distinct urban area, meet with ambitions in favour of urban renewal.

With this research I hope to build an understanding on development dynamics underlying the innovation district initiative which determines the planning and development approach (to be) taken; and accordingly shapes the way local public authorities may contribute to innovation district developments while guarding public interest and achieving adding value to the process and the product of an innovation-rich environment.

## 1.2.2 Research goals

As many cities try to replicate top-down initiated best practice innovation districts (e.g. Barcelona, Boston) this graduation thesis presents the exploration on: the roles local public authorities can deploy in innovation district planning and development and the spatial conditions and interventions they should enhance to stimulate innovation through the built environment.

In the context of this research, innovation districts are acknowledged as economic developments important to raise the innovation profile of cities and regions. However, to bridge the gap of knowledge on the *how* and *what* in innovation district developments this research analyses innovation districts as urban development projects. Accordingly, to provide an understanding on effective *planning approaches* in relation to the *project outcome* and make the topic more researchable this exploration focuses especially on the urban district level.

**planning approach;** *the roles deployed by local public authorities in combination with the allocation of resources and strategic use of planning tools*

**project outcome;** *in terms of spatial conditions, location decisions, and physical interventions needed to develop an innovation district that stimulates innovation*

Most ‘knowledge-based locations are influenced by the socio-economic and institutional characteristics of the place in which they are planned’ and are ‘embedded in planning processes that tend to have significant resources as land, capital, legal power and political legitimacy’ (Carvalho & van Winden, 2017).

This research therefore also examines the *development dynamics* leading to innovation district propositions. Because, understanding the context in which innovation district developments take place,

may help recognise patterns, explain the presence, and help to build knowledge on effective planning approaches to activate innovation districts.

Besides, new ways of collaboration in managing urban development projects has resulted in 'several types of public-private partnerships, but also multifaceted power relations' (Van Winden W. D., 2013). In addition, 'the majority of partnerships in the Netherlands seem not capable of achieving added value (Teisman, 2008). Therefore this research intends to provide an understanding on *public-private partnerships* and thereto related *power relations* within the context of innovation district development by exploring the '*public perspective*' on innovation district developments.

'Public'  
perspective

***'In a context of rising societal challenges, policy and planning systems often lack the resources (information, skills, finance) to fully organise large development projects alone.'***

(Carvalho, van den Berg, Galal, & Teunisse, 2016)

Accordingly, as 'we are facing a period of demand-driven urban developments in the light of a marginal economic growth' (Heurkens, 2012) an understanding on innovation district development from the '*innovator perspective*' is studied to bridge the gap between location preferences preferred by the actual innovators and the ambitions set in innovation districts propositions. Because, when 'assuming that the planning system knows which location will become the innovation district can result in ignorance of this location by the actual innovators' (Clark, 2016).

'Innovator'  
perspective

In conclusion, this research focusses on the planning and development of innovation district at the urban district level as 'the built environments'<sup>3</sup> in which the physical dimension of these projects forms an important resource to stimulate innovation. Assuming that innovation entails a spatial dimension enabling knowledge creation and diffusion and subsequently knowledge application and commercialization. Leading to the ambition of providing an understanding on the spatial conditions that may stimulate innovation through the built environment in the context of innovation district developments.

### 1.2.3 Question statements

As mentioned above this research examines the development of innovation districts to gain insight into the roles local public authorities can deploy in innovation district planning and the spatial interventions they can make to stimulate innovation at the urban district level. Aiming to advice cities in building a customized development strategy so that innovation districts can become more than just branding initiatives or will become neglected by the actual innovators. This research is therefore twofold and comprises of a research on the planning approach (how to develop) and on the project outcome (what to develop).

#### **Main research question:**

***How can local public authorities plan for and subsequently develop innovation districts that deliver on the objective of stimulating innovation through the built environment?***

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<sup>3</sup> **Built environment:** The built environment consists of built forms to shelter, define and protect activities and can be seen as an enabler of activities performed by society, organisations and individuals. This research distinguishes two scale levels namely the urban area level ranging from city to district level and the building level ranging from building block to infill, its interiors design.

To answer this main question, several fields of research are explored and multiple guiding sub-questions were developed to provide understanding and knowledge in order to conduct a case analysis and in the end answer the main research question which can be divided into two:

- What roles performed by local public authorities in innovation district planning, help develop an innovation district that stimulates (the processes leading to) innovation?
- What spatial conditions and physical interventions help develop an innovation district that stimulates (the processes leading to) innovation?

### **Building a theoretical framework:**

Cities, regions and nations are planning innovation districts as a variation of best practices as solution for many economic, spatial and social matters. As a result, there are already over 80 'official' innovation districts developments promoted worldwide (Talkington, 2014). To gain insight into the characteristics of these distinct innovation district developments and conceptualize the concept of innovation districts the first sub-questions is:

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**Q1:**

- What are the distinct (spatial) characteristics of innovation districts?

---

In spite of all the research out there the relation between the built environment and innovation has received little explicit attention in academic research (Curvelo Magdaniel, 2016). However, several concepts from theory help to explore the ways in which the built environment stimulates innovation. Therefore the following sub-question is asked:

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**Q2:**

- How does the built environment stimulates innovation?

---

Besides, as top-down initiated innovation district developments face the risk of being neglected by the actual innovations (Clark, 2016) an understanding on location behaviour of companies in the context of innovation district development, is explained by building knowledge on changing location preferences:

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**Q3:**

- How can we explain localisation behaviour in the context of the rising innovation economy?

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Accordingly, as many European and American cities have tried to replicate top-down initiated best practice innovation districts, (Katz & Wagner, 2014; Morisson, 2015) the roles deployed by local public authorities in these top-down initiated innovation districts is explored issuing the following sub-question:

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**Q4:**

- What planning approaches are deployed in innovation district development projects?

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### Theory testing; structuring the case analysis:

To build an understanding on innovation district development in Dutch urban practice insight into the development dynamics by means of the spatial, institutional, and social-economic characteristics are explored in the case of the Rotterdam Innovation District by answering:

- 
- |            |   |
|------------|---|
| <b>Q5:</b> | <ul style="list-style-type: none"><li>• What development dynamics underlie the innovation district proposition?</li></ul> |
|------------|---|
- 

Accordingly local planning processes and the deployed development strategy are explored by answering:

- 
- |            |  |
|------------|--|
| <b>Q6:</b> | <ul style="list-style-type: none"><li>• Which planning approach is applied in the urban development project and what roles are deployed by the local public authority in the development of the innovation district project?</li></ul> |
| <b>Q7:</b> | <ul style="list-style-type: none"><li>• Which planning approach and what roles should be taken by the local public authority in the development of the innovation district to activate the project?</li></ul>                          |
- 

The final sub-question helps to provide an understanding on the spatial interventions that are proposed by the local public authority, implemented by both public as private actors, and desired by the actual innovators by answering:

- 
- |            |   |
|------------|---|
| <b>Q8:</b> | <ul style="list-style-type: none"><li>• What spatial interventions are initiated by local public authorities to stimulate innovation, what spatial conditions are already in place and what conditions and interventions are desired by the actual innovators present in the innovation district on the urban district level?</li></ul> |
|------------|---|
- 

### Synthesis, conclusions & recommendations:

By combining the findings from the theoretical exploration with the patterns observed through the case analysis, a synthesis on the roles the built environment and urban area development can play in innovation district development projects is provided by answering the following questions:

- 
- |             |  |
|-------------|--|
| <b>Q9:</b>  | <ul style="list-style-type: none"><li>• What can be concluded on the spatial conditions that stimulate innovation focusing on the urban district level in innovation district developments?</li></ul>                                  |
| <b>Q10:</b> | <ul style="list-style-type: none"><li>• What can be learned on the roles local public authorities can take to effectively plan and develop for an innovation district able to spur innovation through the built environment?</li></ul> |
-

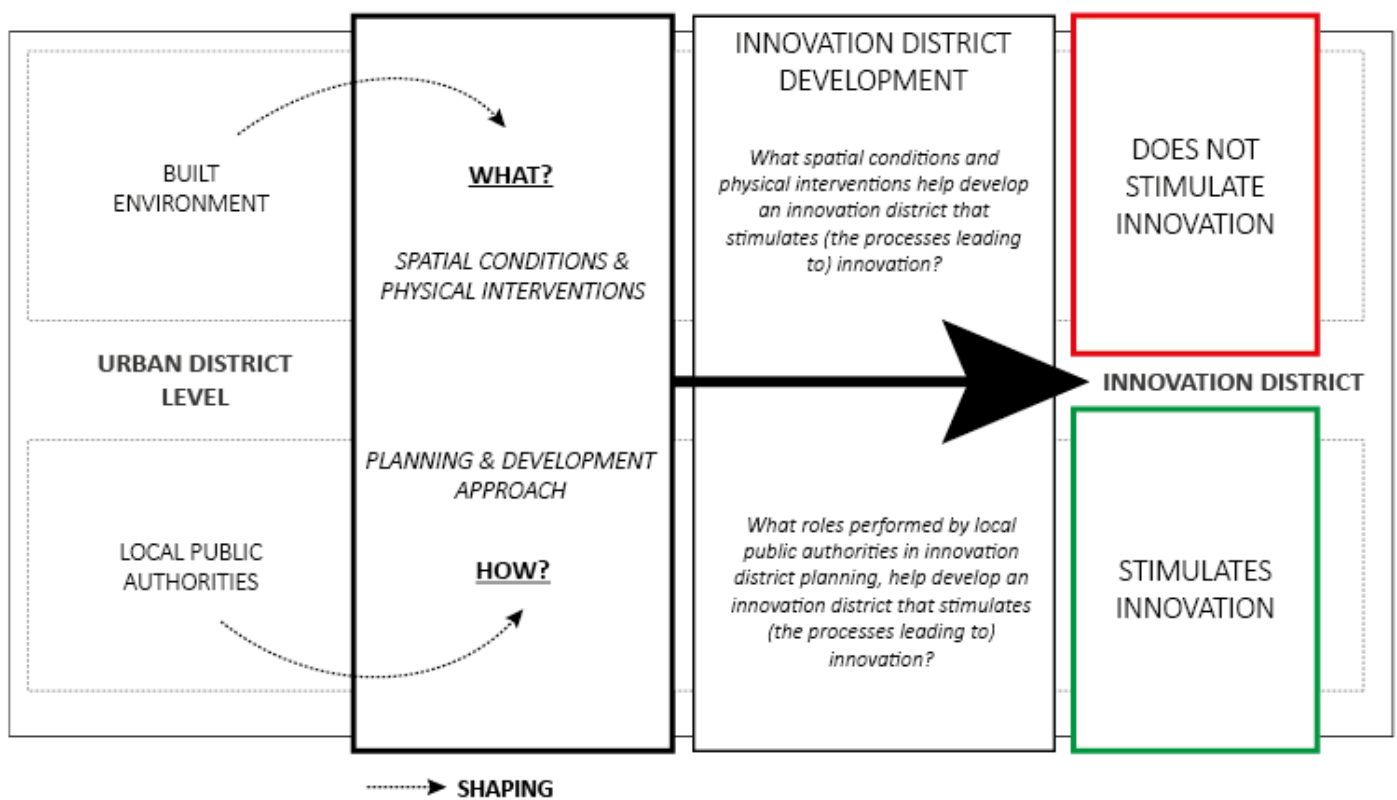
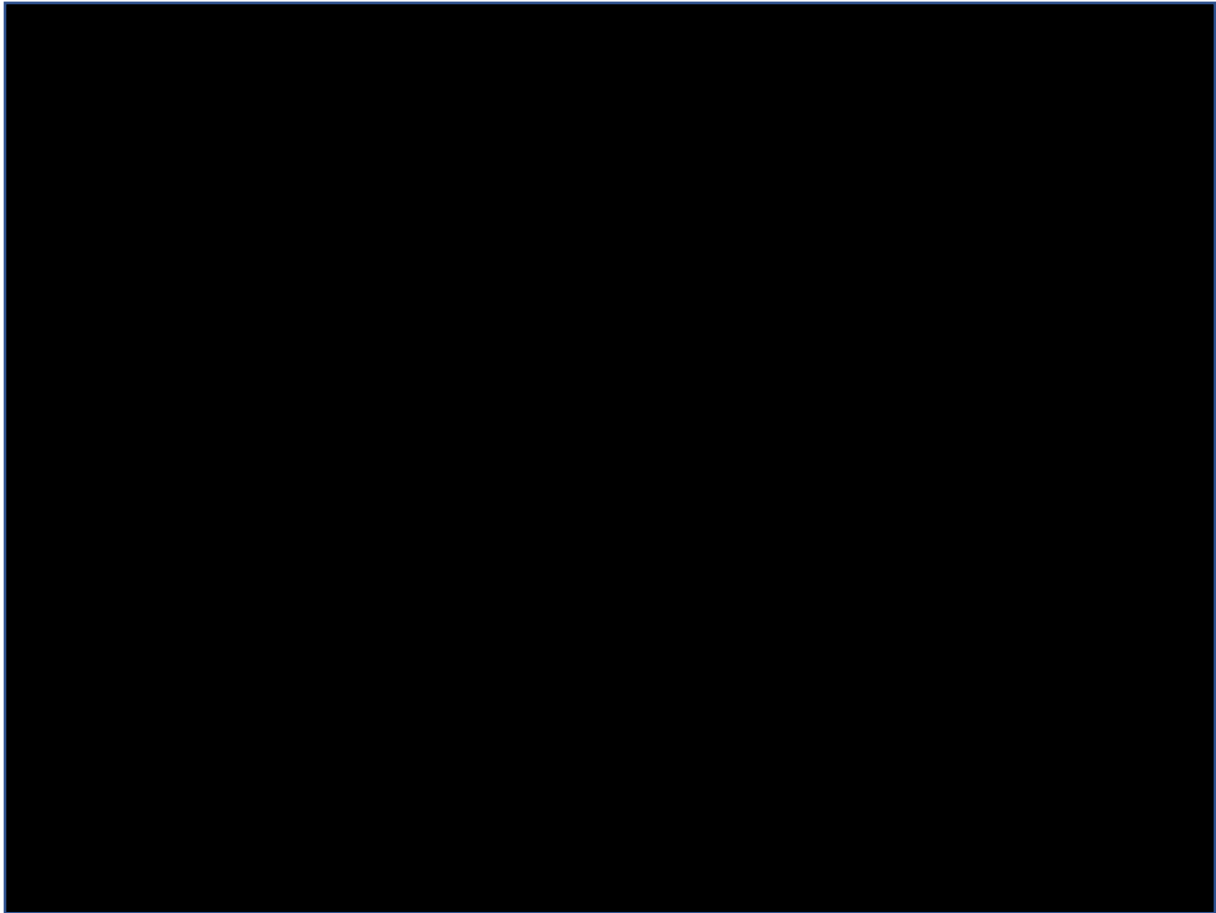


Figure 1.2. Conceptual model: problem definition.



*Photo 1.1. The Merwe-Vierhavens (M4H).*

#### 1.2.4 Case introduction

To answer the main research question of this project a case analysis is conducted. The case to be examined in this thesis is the urban (re-)development project of the Merwe-Vierhavens. The Merwe-Vierhavens as part of the CityPorts project is located in Rotterdam. Rotterdam, known as the second biggest city in the Netherlands situated in Rhine-Meuse-Scheldt river delta is home to Europe's largest port. Rotterdam is like many other cities facing several social, economic, and environmental challenges when it comes to energy transition, creating new job opportunities, safeguarding the economic positioning of the port, and adapting to the rising knowledge-intensive economy. Accordingly, innovation programs and the transition towards the Next Economy<sup>4</sup> are becoming more important for the city of Rotterdam according Maarten Struijvenberg, alderman Employment and Economy: as 'change is inevitable and innovation increasingly important'. Therefore Rotterdam is seeking for new ways to create a climate in which innovation can flourish (EVR, 2016).

---

<sup>4</sup> **Roadmap Next Economy:** to improve accessibility and strengthen the economic business climate the metropolitan region Rotterdam-Den Hague partnered with knowledge institutions and companies and collaborated with Jeremy Rifkin, an American economic and social theorist, to construct a principles-based framework for action and investments.

## Merwe- Vierhavens

The Merwe-Vierhavens, referred to as M4H, is one of the older port areas situated at the north side of the Meuse. Once known as one of the largest fruit ports in the world. Since 2004 this area, as part of the CityPorts project, is gaining attention for revitalisation. This area comprises the Merwehaven and the Vierhavens including the Keilehaven, Lekhaven and the IJsselhaven counting for 140 hectares. M4H entails an industrial site in transformation. The Merwe-Vierhavens, the Lekhaven and the IJsselhaven are still actively used by port-related activities. Gradually the more traditional port activities are expected to transform into new business activities or to shift to deeper waters. This 'transition zone', where city and port meet, is characterized by industrial structures, simplistic industrial halls, occasionally interspersed with historical warehouses, and large scale truck-based infrastructures. In addition, vacant office buildings and industrial warehouses are being refurbished and accommodate creative pioneers and entrepreneurs.

This area was envisioned as the next large-scale urban waterfront redevelopment project but due to the crisis in 2008 the municipality lacked resources to make substantial investments upfront and there was little market demand for residential real estate developments as the area was still dominated by industrial functions. By 2014 the project team M4H adopted an incremental urban area development approach in which the market is invited in jointly redeveloping this area and which provides a flexible development framework that can easily respond to market initiatives.



Figure 1.3. Merwe-Vierhavens. (Stadshavens Rotterdam, Januari 2009)

In 2015 the Merwe-Vierhavens gained renewed attention as the Rotterdam Innovation District was launched, initiated by Stadshavens Rotterdam. The Merwe-Vierhavens and RDM were appointed as specific locations suitable to spur innovation and became branded as important components of the innovation ecosystem of Rotterdam. According to the former programme director Stadshavens Rotterdam these areas entail many ingredients that spur innovation and provide the right ingredients to develop an innovation district. The official announcement in combination with a publication on the Rotterdam Innovation District was complemented with a position paper stimulating the municipality of Rotterdam and the Rotterdam Port authority N.V. to make use of the momentum created.

These propositions on developing the Rotterdam Innovation District pose new roles, strategies and spatial interventions. According to former area manager of the Merwe-Vierhavens project team several challenges have to be dealt with as realising commitment of city and port; organizing and specifying the programme of implementation; and facilitating and contributing to the actual innovation agenda.

***Stadshavens Rotterdam: The alliance between the Port of Rotterdam authority N.V. and the municipality of Rotterdam appointed to manage the (re-) development of the city-port areas of Rotterdam – the CityPorts project.***

In relation to this case, we have already learned that besides providing a follow-up to these Innovation District propositions, Stadshavens is entrusted to define the right project scope; find common ground within the Stadshavens alliance on port and city development objectives; and redefine common long-term development objectives in line with the Innovation District propositions while being able to react on current market-demand.

In addition, Stadshavens Rotterdam is lacking mandate and funds to actively develop the Merwe-Vierhavens and occasionally gets affected by local politics or overruled by negotiations exceeding the CityPorts project scope. Despite the different business cultures and goals – because in the end different objectives for city and port are represented – Stadshavens Rotterdam is exploring new collaboration models in which smart use can be made of the landownership at the decisiveness of the Rotterdam Port authority N.V. in combination with the municipality as representation of the civic society to realise a strong commitment.

In this context the Rotterdam Innovation District, as initiated by Stadshavens, is seen as urban area development project part of the Rotterdam CityPorts project. Some would refer to this project as an example of ‘urban regeneration’, ‘integrated area development’ or ‘waterfront revitalisation’, regardless the specific description in essence, it is about an urban development project dealing with a long time frame for at least the coming twenty years; with a specific geographical scope along the waterfront of the Meuse where city and port activities meet; involving multiple stakeholders with differing development interests; in which the project has evolved over time and continues altering, serving changing social-economic demands and renewed development objectives. In the light of this research; the development of the Rotterdam Innovation District.

*Abbreviations*

M4H	Merwe-Vierhavens
RDM	Rotterdamse Droogdock Maatschappij

*Translations*

Stadshavens	CityPorts (project)
Havenbedrijf Rotterdam N.V.	Rotterdam Port authority (N.V.)



### 1.2.5 Definitions

This section contains important terms that are frequently used in this report.

**Knowledge economy:** In this research the knowledge economy is seen as a system perspective used by governments to frame their perspectives for developing science, technology and innovation policies (Curvelo Magdaniel, 2016).

**Innovative capacity:** The ability to create, diffuse, applicate knowledge and commercialize innovations.

**Innovation:** In theory innovation is seen as the application and commercialization of technology and knowledge in order to develop new or improved ideas, products, services, technologies, or processes that have the potential to create new market demand or be socially, economic, or scientifically transformative.

**Innovation ecosystems:** These systems model the dynamics of the complex relationships that are formed between actors or entities that enable innovation (Jackson).

**Open innovation:** According (Chesbrough, Vanhaverbeke, & West, 2008) open innovation is a paradigm that assumes that organisations should no longer only built on internal ideas but should allow external ideas and ways to market as well to accelerate internal innovation.

**Innovation districts:** In this research innovation districts are seen as urban living and working environments embedded in the city in which the commercialization of innovation is stimulated and open innovation is promoted, aiming to react on changing socio-economic demands.

**Built environment:** The built environment consists of built forms to shelter, define and protect activities and can be seen as an enabler of activities performed by society, organisations and individuals. This research distinguishes two scale levels namely the urban area level ranging from city to district level and the building level ranging from building block to infill, its interiors design.

**Urban management:** Urban management involves an active role of (urban) stakeholders in mobilizing, managing, and coordinating resources to support the objectives of urban (area) development and ensure the vitality of cities. Due to rapid urbanization half of the world's population lives in urban areas leading to a growing concentration of people in cities. Cities must continuously adapt to new social, economic and spatial demands and needs in which urban management can set a framework for urban development and adopt an integrated and durable approach to issues of function, space and society (Verlaet & Wigmans, 2011).

**Urban (area) development projects:** Urban development projects can be seen as planned urban interventions including several processes to form and shape the city. The effort to co-ordinate and integrate public as well as private actions through an integrated approach are needed to create a more competitive, resilient, smart and sustainable city. Accordingly it refers to a framework of concrete material interventions inside a geographically distinct urban area (based on: Daamen, 2010).

**Urban area development:** An urban area development is seen as a way of working in which government bodies, private parties, and other actors involved reach an integration of planning activities and spatial investment, eventually resulting in the implementation of spatial projects (based on: Daamen, 2010).

*Just make it*



# CHAPTER 2

## METHODOLOGY

### 2.1 RESEARCH DESIGN: A SINGLE CASE STUDY

exploratory  
research

This graduation project can be categorized as an exploratory research of planning and development processes driving the Rotterdam Innovation District. This research topic has derived from a fascination obtained during my internship at the Rotterdam Port Authority on the phenomenon ‘innovation district’ in relation to the redevelopment project of the Merwe-Vierhavens. This specific case reflects an example of economic aspirations aiming to raise the innovation profile of a distinct urban area that meets a physical urban area redevelopment project. To provide an understanding on this encounter this thesis intends to build an explanatory framework that creates insight into innovation district development in Dutch urban planning and development practice. To do so, the thesis will use several components of existing theories in combination with a case study to reflect on these theories. This is done through a single case study research design, using both structured and an unstructured interview methods (Kumar, 2011).

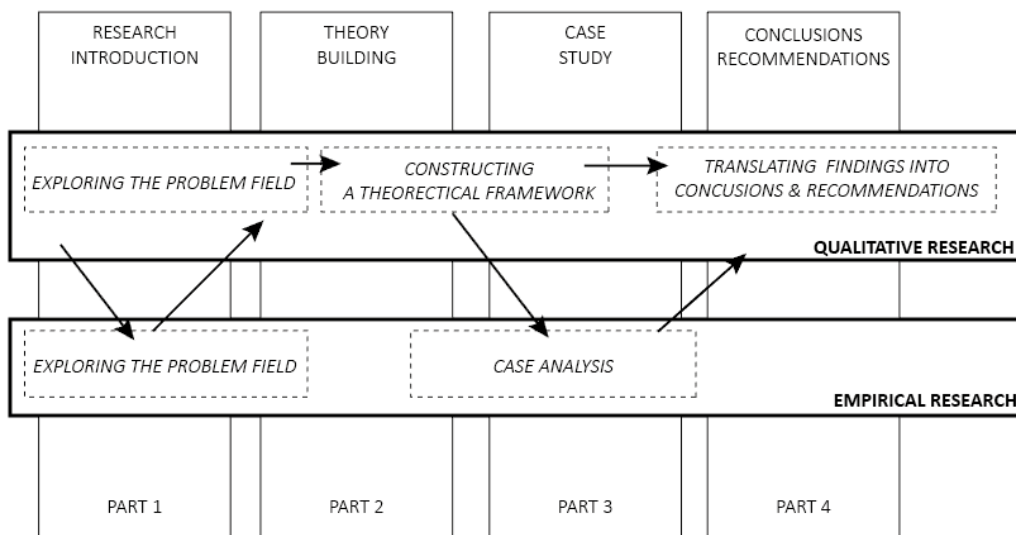


Figure 2.1 conceptual model: research steps.

Analysing former academic work and literature will connect existing knowledge on innovation districts, urban management, and the CityPorts project. Theory and practice, are used in a way that research findings can be verified and confirmed. Providing a more comprehensive and grounded answer on the research question. Accordingly, both theoretical and empirical findings can complement each other, as one method can be used to fill in the gaps of the other one and make relevant links, promoting mutual understanding (Johnson, Onwuegbuzie, & Turner, 2007).

A literature review will be conducted to create a theoretical framework as starting point, in order to carry out the empirical part of this research and later on in the process draw conclusions and provide recommendations. Empirical research contains an in-depth case study of the relations drawn out of the literature concerning the research topic: innovation district development in the context of the Rotterdam CityPorts project (figure 2.1).

*'If it is valid for this case, it is valid for all (or many) cases.'*

(Flyvbjerg, 2006)

According to Yin (2014), case studies are used out of the desire to understand complex social phenomena as neighbourhood change and economy of regions and to answer research questions of a more explanatory or exploratory nature around “how” and “why”. Case studies also try to illuminate a decision or a set of decisions: why they were taken, how they were implemented and with what results. In addition, they intend primarily to contribute to policy and decision-making rather than to science (Schramm, 1971 ). As this research is focussed on providing insights and recommendations to local public authorities on innovation district development, namely the Rotterdam CityPorts project, an in-depth, qualitatively driven research project seems suitable (figure 2.2).

Case study  
design

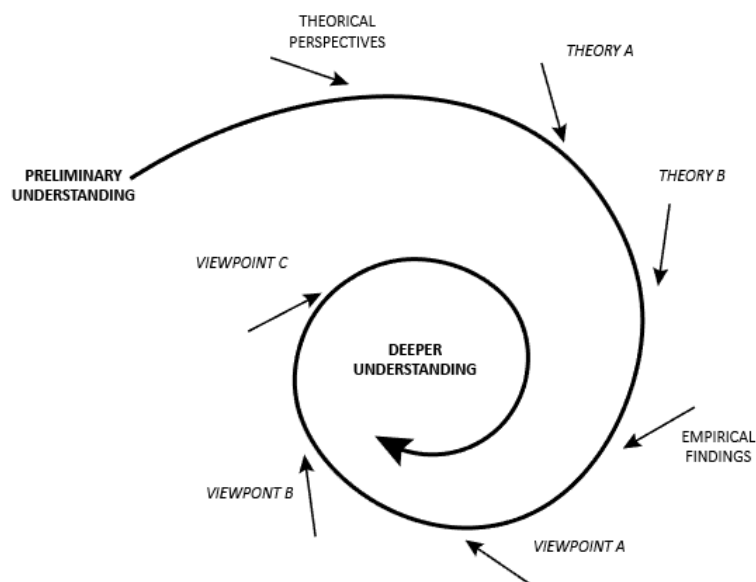


Figure 2.2 conceptual model: research aim. Based on: Pentti, R. 2007

In addition, by choosing an in-depth study to bring an understanding of innovation district development through a detailed analysis of a limited number of events, conditions and their relationships, the field of research is narrowed down into fewer easily researchable examples (Lynn & Lynn, 2015). Besides, a single in-depth case study design is chosen, to produce new forms of understanding and practical knowledge on innovation district development, both in process as spatial product. Obtaining a single in-depth case analysis is both driven by practical as situational motives. Practical, as I had access to documents and those involved in the project to gather information and was working from the CityPorts Programme Office located in the project area. Besides, as stressed in my problem analysis, Dutch urban development practice is dealing with new public-private partnerships and multifaceted power relations in which local public authorities are exploring new ways of collaboration, management, and achieving added value in urban development projects. The case on the Merwe-Vierhavens includes these objects for study making a logical base for selecting this specific case and conduct a single, in-depth case study.

## 2.2 DATA COLLECTION: METHODS USED

In this research, data is collected through literature review, semi- and unstructured interviews and direct observations from practice in combination with a review of empirical documents like development strategies, spatial plans, as well as internal propositions related to the Rotterdam Innovation District project. The first part of this research focuses on literature review using, besides (recommended) literature related to this research topic, the internet to compare facts and figures through multiple web sources. In addition, consultations with involved practitioners; helping to define an accurate problem statement; set a theoretical framework; provide an explanation on planning examples; and explore the case selected for an empirical in-depth analysis.

*The essence of the case study approach relies on a variety of sources to provide meaningful observations.*

Derived from (Morisson, 2014) based on (Schramm, 1971 )

During the empirical research, data and knowledge from literature review was connected with findings from semi- and unstructured interviews. Together they form the base to formulate conclusions and recommendations on innovation district development in terms of effective planning approaches to be deployed by local public authorities and project outcome in terms of spatial interventions that are able to spur innovation at the urban district level (figure 2.3).

Desk analysis

The literature review can be divided into three parts. First, a literature study is conducted through the exploration of the problem field and research field in order to explore the concept of innovation districts in relation to the case of the CityPorts project in Rotterdam. Secondly, it helped developing knowledge on the relation between the built environment and innovation. Besides that, to link and position literature used in this research it was used to the construct of a theoretical framework and thirdly to come to a final synthesis and combine qualitative findings and field research and formulate recommendations.

Fact-finding mission

To get an idea about the scope of the case to be analysed, the first part of my internship at the Rotterdam Port authority was used to collect relevant and current data. First data was collected on the course of events at the CityPorts projects related to the Merwe-Vierhavens in the broader context. Next to that, a document analysis was carried out about the vision and strategy for (re)developing this specific area over the last 15 years, followed by exploratory informal discussion to get an idea about how people within the organisation and outside the organisation think about the Rotterdam Innovation District propositions. After that, I used my internship position to obtain several interviews.

Bias

To overcome personal biases and interpretations the data for analysing the case study came from a broad collection of sources, ranging from planning documents and urban studies to direct observations and scientific journals and from interviews with individuals and professional experts involved in the development of the Rotterdam Innovation District to the end-users situated in the district. These 'multiple perceptions are used to clarify meaning and verify the repeatability of an observation' (Stake, 2005).

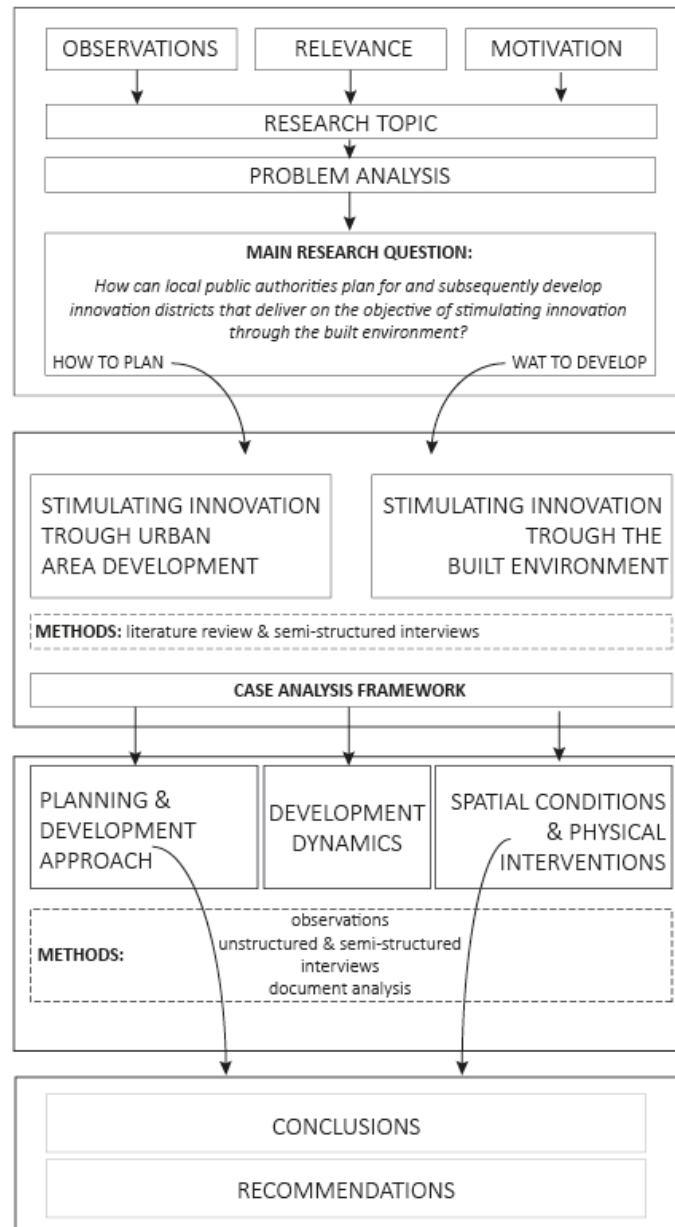


Figure 2.3 conceptual model: research approach.



# **PART 2**

## **THEORETICAL PART**



# CHAPTER 3

## *The rise of Innovation Districts*

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*This chapter provides insight into the concept of innovation districts in relation to the built environment. It particularly explores the question what the spatial and organisational characteristics of this new urban model are.*

### 3.1 INTRODUCTION

Innovation is seen as a solution for many economic, spatial and social matters and therefore cities, regions and nations are planning innovation districts as a variation of best practices like the Boston Seaport project and 22@Barcelona. As a result, there are already over 80 ‘official’ innovation districts developments promoted worldwide (Talkington, 2014). This chapter focusses on the spatial characteristics of these distinct innovation district developments in order to answer the following question: *What are the distinct (spatial) characteristics of innovation districts?*

Theoretical  
foundation

Defining the relation between the concept of innovation districts and the built environment, focussing on the urban district level, brings many challenges due to the fact that innovation districts are mainly analysed in studies on agglomeration economies and economic geography. Stressing the importance of innovation on the regional and city scale levels. Besides that, innovation districts became a popular concept in spatial planning. Resulting in the emerge of a wide variety of distinctive innovation districts that deal with the complexity of facilitating and stimulating innovation and in which many different urban theories ranging from Marshall’s ideas on the industrial district (Marshall, 1920) to Chesbrough’s theory on the improvement of internal and external innovation (Chesbrough & Crowther, 2006) are combined. In addition, the concept of innovation districts includes the ideas of Florida on the role of the creative class (Florida R. , 2002); Jacobs’ urban theories on mixed-use within the city (Jacobs, 1969); Porter’s cluster theory on economic competitiveness (Porter, 2000); and Leydesdorff and Etzkowitz’s triple helix and quadruple helix model on the dynamics of innovation (Etzkowitz, 2008).

*‘Innovation districts are the by-product of theories in innovation and a convergence of social and technological forces as a response to new productive conditions emerging from globalisation and advances in ICT.’*

(Morisson, 2015)

Empirical  
foundation

Accordingly, academic research on innovation districts carried out by Katz & Wagner (2014) and Morrison (2015) are both driven by research on knowledge-intensive milieus (Link & Scott, 2006; van Winden, 2011); a changing society, economy and city (Jacobs, 1969; Florida, 2002; Hall, 2004; Castells, 2011; Simmie, 2013); city development and urban competitiveness (Clark, 2010; Glaeser, 2011; Porter, 2011) and the geography of innovation (Audretsch, 1998; Leydesdorff & Etzkowitz, 2003; Chesbrough, 2006).

Besides that, recent empirical studies conducted by the Urban Land Institute and the Dutch Environmental Assessment Agency (PBL) in collaboration with Ruimtevolk on innovative environments and best practices in Dutch and international context, provide lessons for cities that want to develop innovative environments like innovation districts (Clark, Moonen, & Peek, 2016; Lekkerkerker & Raspe, 2016).

Due to this great versatility of applicable theories on innovation in relation to place, in the context of innovation district development, and recent academic research on innovation districts and innovative environments in general, this chapter will first briefly explain the context in which these developments take place (section 3.2) and then define the concept of innovation districts to be used in this research (section 3.3), before elaborating on the spatial (section 3.4) and organisational characteristics found in theory on innovation district developments (section 3.5).

## 3.2 CONTEXT: TOWARDS AN INNOVATION ECONOMY

*A nation's competitiveness depends on the capacity of its industry to innovate.'*

(Porter, 1990)

Most developed countries are seeking to increase the competitiveness of their economies by promoting innovation (Hart, 2000). Innovation economics emphasise entrepreneurship and innovation – innovative capacity – as driving forces of productivity and economic growth. Cities have to stimulate economic growth by increasing their productivity. Productivity can be improved by working harder or by working smarter. Economic growth in this context is represented by R&D output and patents instead of the neoclassical thoughts on economic growth by capital and labour accumulation. The knowledge-intensive economy refers to the increased economic significance of knowledge production, distribution, and use (Van Winden W. D., 2013). In this new economy, it is not physical labour, but human creative capabilities that generate value (Florida, 1993).

Innovative  
capacity

This paradigm-shift was initiated by technological innovations and subject to new productive conditions that are emerging from globalization and advances in ICT. These innovations have, over time, strengthened the economic power of a number of global cities (Castells, 1989). But they also changed socio-economic urban structures significantly in which the whole organization of production adjusted and the boundaries between innovation and production were removed (Florida, 1993).

*'Successful cities are the ones that are adapting best to this paradigm-shift'*

(Morisson, 2014)

When redefining the role of the city, caused by economic and political forces, it is important to understand the changing role of cities in national economies due to several structural alterations. In the beginning of the 21st century, the rise of the global economy and the revolutionary nature of ICT caused innovation to flow back to urban areas (Morisson, 2014). Meanwhile economic gravity moved from industrial cities such as Detroit or the Ruhr, to innovative and entrepreneurial cities and regions such as Silicon Valley and Route 128 (Stimson, 2006).

*‘Patents and innovations are disproportionately produced in large cities’*

(Carlino, 2001)

These cities represent places where interactions between different types of knowledge and competencies are happening on a large scale and new ideas are being commercialized based on interactive processes between different actors that can lead to problem solving, progress and economic growth (Bathelt, 2004). To facilitate and stimulate innovation this is getting cities in general reappreciated and growing in importance. Unfortunately, not all cities profit from this transition. Most of the competitive advantage of countries and organizations rely on their innovative capacity (economic base) and therefore on their ability to attract and retain talented people (human capital). Besides, due to the highly localized nature of knowledge-intensive activities, cities are forced to adopt strategies in favour of innovation in order to remain competitive (Curvelo Magdaniel, 2016).

### 3.3 DEFINING THE CONEPT OF INNOVATION DISTRICTS

Innovation districts have proven to be effective solutions for cities to facilitate knowledge diffusion through open innovation as a strategy to modernize their economies and pivot from traditional industrial-based production to technology-driven services (Ross, 2014). Developments like the Boston Innovation District made innovation districts a popular concept due to its mainly economic success (table 4.1) and therefore many cities have tried to ‘copy-paste’ or at least remake these successful environments (Morisson, 2015).

	<b>+5000</b>
<i>Job creation</i>	30% technology sector
	21% creative industries
	<b>+200</b>
<i>New companies</i>	10% education & non-profit sectors
	40% incubators, co-workers & shared space
<i>Start-ups</i>	<b>+1200</b>
<i>Rent increase</i>	<b>+43%</b>

Table 3.1. Boston’s Innovation District economic success. Based on (Ross, 2014)

Innovation districts intend to facilitate open innovation in such a way that economic production flows back into cities (Morisson, 2014). These urban areas are different compared to innovative milieus like science parks and technology campuses which are inspired by the geographic model of places like Silicon Valley which are mainly car based, spatially isolated, dominated by green field developments, and turned inwards in terms of knowledge creation and diffusion (figure 4.1). Between the seventies and nineties national and local authorities developed these technology parks outside the city aiming to create scientific clusters in which the excitement of the city was recreated without the chaos and inefficiencies of the city. Innovation districts, on the other hand, intend to facilitate open innovation within the city by focussing on the quality of life; integrating work, living, and leisure; and stimulating collaborations between knowledge institutions, public authorities, the private sector and civic society to overcome organisational or sectorial limits and stimulate crossovers (Katz & Wagner, 2014).

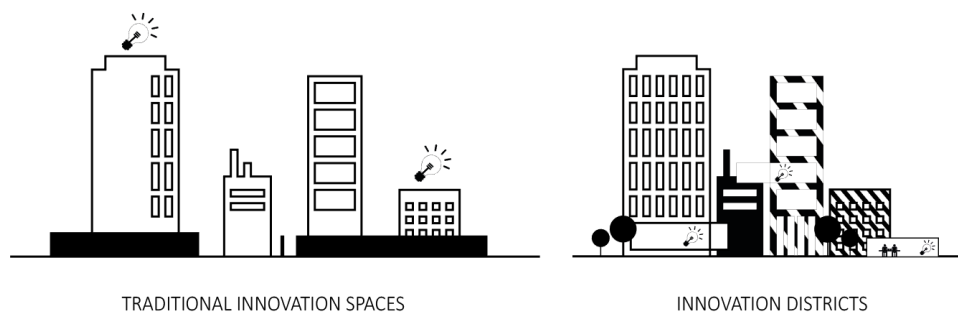
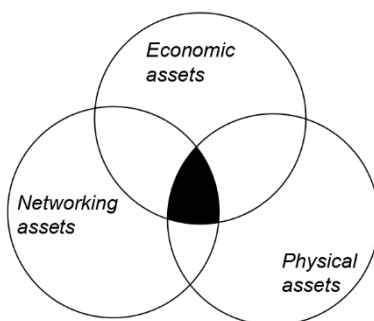


Figure 3.1. Conceptual model: Innovation Districts.

In this context, innovation is more and more about borrowing and combining ideas via a collaborative approach in which organisations enhance external ideas and ways to market – *open innovation*<sup>5</sup>. In this way internal innovation can accelerate and markets for external use of innovation be expanded. (Chesbrough, Vanhaverbeke, & West, 2008). What distinguishes innovation districts also from the traditional innovation environments is that these districts try to respond to a new economic paradigm in which economy is shifting from mass-production to mass-specialization and is moving towards a more knowledge-intensive economy instead of a labour-intensive one (Katz & Wagner, 2014; Morisson, 2015; Hanna, 2016).



In order to respond to these socio-economic changes, innovation districts have to constantly reinvent themselves to become more than a common district. Based on the theories constructed by Katz & Wagner (2014) and Morisson (2015) innovation districts aim to spur innovation through urbanity and proximity (*physical dimension*); collaborations, interactions, and connections (*networks*); and through a supportive environment in which idea generation, knowledge spill-overs, and the commercialization of knowledge is stimulated (*supportive economic environment*).

Figure 3.2. Innovation district assets. Based on Katz & Wagner (2014)

<sup>5</sup> **open innovation:** a collaborative approach in which organisations enhance external ideas to accelerate internal innovation and expand ways to market external use of innovation (Chesbrough, Vanhaverbeke, & West, 2008).

Economic  
assets

As the commercialization of new ideas relies partly on collaborations between individuals, companies, universities, and institutions, the presence of knowledge-intensive companies, entrepreneurs, and start-ups is essential. Entrepreneurs are essential as they revolutionize the patterns of productions needed for economic development. Universities, on the other hand, have a central function in fostering innovation when holding sufficient industry linkages. They are seen as stimulators of technological spill-overs, research productivity, patenting, licensing and entrepreneurship, while producing spinoffs (Siegel, 2003). Research institutions and universities have been central in fostering innovation, driving growth in cities and are becoming more important, both in terms of economic output and employment numbers (Hanna, 2016). Besides, universities are becoming more deeply embedded in innovation systems and are seeking to actively foster interactions and spill-overs; to link research with application and commercialization; and taking on roles of catalysing and animating economic and social development (Siegel, 2003). To create a successful innovation district universities and research institutions should be involved in the planning of innovation districts and at best be present in the district itself (Morisson, 2015). Unfortunately many districts do not originally include universities, especially in the typology of re-imagined urban areas (Katz & Wagner, 2014).



*Figure 3.3. Drivers of regional innovative capacity.*

The role of  
Universities

Looking at MIT in Boston and Stanford University in San Francisco both universities played a critical role in the development of the two regions in terms of their innovative capacity. Because these universities had a strong linkages with private companies; the government provided suitable policies to foster innovation; and due the presence of these well-established, top-ranked research universities and complementary assets for commercialization these regions were able to produce successful innovative milieus (Saxenian, 1994).

Successful innovation districts also rely on (social) network building and openness (Katz & Wagner, 2014). Social networks have been crucial to the growth of Silicon Valley and other innovative milieus (Castilla, 2000). These networks promote face-to-face interactions and reinforce cognitive proximity<sup>6</sup>. In this context, weak and strong networks are equally important (Morisson, 2015). Weak networks acquire knowledge and new ideas while strong networks facilitate the commercialization of these new ideas and knowledge followed by the conversion into innovations. Weak ties can be built through networking assets focussing on building new, often cross-sector, relationships including 'networking breakfasts where experts and star innovators offer new insights in their fields followed by open time to network; innovation centres; hack-a-thons across industry clusters such as life sciences and tech; tech-jam start-up classes; and even the choreographed open spaces between highly programmed buildings generating "collision points" between smart people' (Katz & Wagner, 2014).

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<sup>6</sup> **Cognitive proximity**: indicates the extent to which (two) organizations share the same knowledge base while social proximity indicates the extent to which the members of organizations have friendly relationships (Boschma, 2005).

Accordingly, urbanity and density matters when it comes to living but also to working. According Katz & Wagner (2014) a growing share of metropolitan residents are choosing to work and live in places that are walkable, bike-able, and connected by transit and technology and research by Florida (2014) on mapping venture capital activities shows that 'high tech development, start-up activity, and venture investment have recently begun to shift to urban centres and also to close-in, mixed-use, transit-oriented, walkable suburbs (Florida R. , 2014).

*'The evolution of a knowledge and technology driven economy is altering the value and function of density and proximity.'*

(Katz & Wagner, 2014)

These ingredients – *urbanity and advantages through proximity, networks, and a supportive economic environment* – can be easily found in any city; however to which extend they deliver an actual successful innovation district depends on how all these aspects interact; to which extent they are present and their level of refinement. As a result, inefficiencies resulting from a lack of coordination undermine the process of innovation (Morisson, 2015). Therefore some prerequisites are needed to be present in order for innovation districts to accelerate the process of innovation (Katz and Wagner, 2014; Morisson, 2015). These prerequisites are defined as the presence of an independent collaborative organization to develop the district; secured independent funding to kick-start the development; critical mass of human capital to foster knowledge-intensive activities; complete and well-integrate economic, physical and networking assets; and an environment open to change, enhancing new ways of thinking.

## 3.4 DISTINCT CHARACTERISTICS

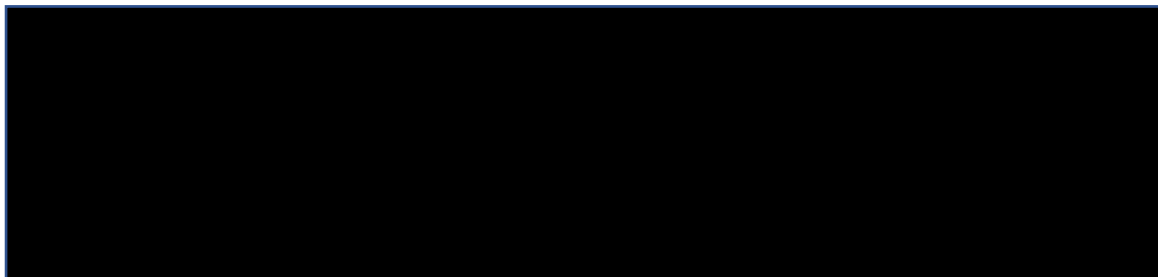


Photo 3.1. Innovation District typologies.

Given the vast distinctions in regional economies, drivers, goals and access to knowledge, innovation districts differ markedly in form and function. Nevertheless, three main typologies are defined in theory concerning the urban lay-out of innovation districts. Namely 1) The anchor-plus model is embedded in the urban fabric of the city centred around major anchor institutions, related firms, entrepreneurs, and spin-off companies and driven by local and regional economic developments; (example left: Medical Centre in Houston Texas); 2) the re-imaged urban areas and ex-industrial urban areas that are mainly embedded in the peripheral areas of the city sometimes near historic waterfronts and industrial districts where urban (re)development projects meet economic aspirations and are in need for urban renewal and rebranding (example middle: South Waterfront Boston); and 3) innovation districts mainly located outside the city encompassing former isolated science and technology parks that got urbanized, accordingly reconnected with the city. (example right: Research Triangle Park North Carolina).

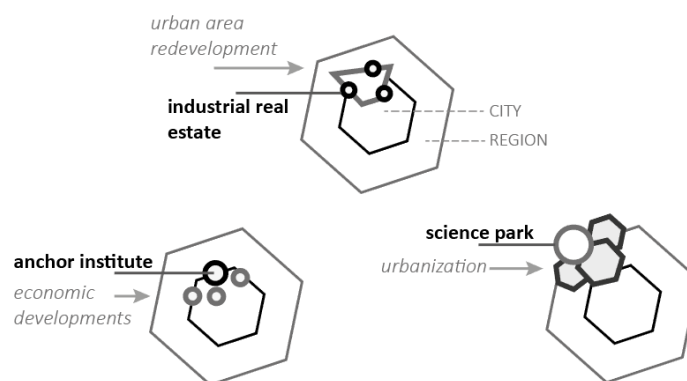


Figure 3.4 Innovation District typologies based on Katz & Wagner (2014).

Innovation district developments count multiple goals (table 3.2). From a spatial perspective they are being implemented to spark urban regeneration in cities as diverse as Barcelona (2000), Boston (2010), Medellin (2013), Montreal (2013), Detroit (2014), and Rotterdam (2015). But the concept of innovation districts is also used from an economic perspective to speed up the transition towards a knowledge-based economy; stimulate sustainable economic growth; strengthening cities' competitiveness; or rebrand a city internationally. Furthermore the concept is also promoted to attract, nurture or retain human capital, creative entrepreneurs and innovative companies; and strengthen locational advantages through the output of innovative and knowledge-intensive products and services to become or remain an innovation hub (Clark, 2010; Katz & Wagner, 2014; Morisson, 2015).

Development  
objectives

Performance criteria		Innovation District development objectives
<b>Competitiveness</b>	<i>Profitability</i>	stimulate revenue growth
		stimulate job creation
	<i>Productivity</i>	stimulate the commercialization of ideas
		increase innovative and knowledge-intensive output
	<i>Distinctiveness</i>	speed up the transition towards a knowledge-intensive economy
		strengthening cities' competitiveness
		rebranding a city internationally
<b>Sustainable development</b>		attracting, nurturing and retaining human capital, creative entrepreneurs and innovative companies
		spark urban regeneration
		more efficient use of the urban environment

Table 3.2. Performance criteria.

In the case of the 22@Barcelona project four main goals were incorporated in the operational plans namely 1) foster the development of new activities through urban regulations; 2) create diversity; 3) encourage density; 4) and generate a good quality of life. For the Boston Seaport project which included four different districts – Fort Point, Fan Pier, the Seaport World Trade Centre, and the Boston Maritime Industrial Park spread out over 405 hectares, twice the size of the 22@Barcelona scope, the main ambition was to transform these areas into an urban environment that fosters entrepreneurship, collaboration, and innovation (Sharma, 2012).



Figure 3.5. Innovation District developments driven its municipal departments.

Drives

The mayor's office and the municipal departments are the primary instigators in deciding to create an innovation district when we look at Barcelona, Boston, Medellin and Singapore (Morisson, 2015). These districts are driven by strong visions of mayors like Tom Menino (Boston) and Joan Clos (Barcelona) to realise something new and unconventional. Thomas Menino initiated the development of the Boston innovation district to pursue his agenda centred on shared innovation. Aiming to transform an underused part of the city by improving the quality of life and providing diverse housing options; promoting entrepreneurship to attract and retain young graduates and students in the city; and maintaining the competitiveness of Boston by anticipating on the changing location preferences of knowledge workers favouring cities and urban features above suburban science parks.

***'Investors, landowners, developers and policies can all play a catalytic role in enabling an innovation district to achieve scale and critical mass.'***

(Clark, Moonen, & Peek, 2016)

When designing the Boston Innovation District several stakeholders got involved. Besides the mayor, the mayor's office and the City of Boston, the Redevelopment authority (BRA) and several real estate developers participated (Morisson, 2015). Real Estate actors like major landowners, real estate developers and investors are, on the other hand, driven by profit and feasible business cases so when the benefits exceed the costs, commitment on unconventional thinking and an active participation in developing these districts can be achieved. So when real estate developers, entrepreneurs or private firms form the driving force in innovation district development priorities can shift towards profits, returns of investment, or attracting and retaining the best employees. Other drivers like corporations and innovative entrepreneurs want to attract and retain the best employees and impulse innovation. Another import driver is the involvement of knowledge institutions as addressed in chapter 3. Universities play a pivotal role in the success of innovation districts because they provide fuel for innovations with future entrepreneurs, talented graduates, entrepreneurial professors, and seed capital for start-ups (Morisson, 2014).



DRIVER	WHO	WHERE
<i>Mayors and local governments</i>	Mayor Tom Menino & Joan Clos City governments	Boston // Barcelona Stockholm // Medellín Singapore
<i>Major real estate developers and major land owners</i>	Vulcan Real Estate Brooklyn Navy Yard	Seattle New York
<i>Philanthropic investors</i>	New Economy Initiative Kresge Foundation Danforth Foundation	Detroit Detroit St. Louis
<i>Managers of research campuses</i>	Triangle Park Foundation Texas Medical Centre	Houston
<i>Anchor companies</i>	Quicken Loans Comcast Amazon	Detroit Philadelphia Seattle
<i>Advanced research institutions</i>	Carnegie Mellon Drexel University MIT	Pittsburgh Philadelphia Cambridge
<i>Advanced medical campuses</i>	Henry Ford Health System University of Pittsburgh MC	Detroit Pittsburgh
<i>Incubators, accelerators, economic cultivators</i>	Barcelona Activa Cambridge Innovation Centre BioGenerator	Barcelona Cambridge St. Louis
<i>Social networking programmers</i>	Venture Café Foundation High tech Campus	Boston & Cambridge Eindhoven

Table 3.3. Drivers of Innovation Districts. Based on (Katz & Wagner, 2014)

We can therefore say that the development of innovation districts can be driven by politics or spatial and economic opportunities and count various development objectives and drivers. There are examples of innovation districts planned as top-down urban strategies to achieve goals imposed by municipal bodies. Sometimes these innovation district ambitions derived from the examples of successful urban innovative milieus like Silicon Alley in New York, Cambridge in Massachusetts, and in Paris' Silicon Sentier in which spontaneous growth was achieved with minimal formal planning (Morisson, 2015). On the other hand there are also examples of innovation district initiatives led by major corporate investments in which the private sector actively took the lead in initiating the innovation district development.

The rise of the more private sector-led developments can be explained, in the context of urban planning in Western countries, through the shifting power between the public sector and the private sector, and changing societal values, between collectivism and individualism, influencing the relationship between the public and private sector in managing the built environment. Since the 1970s urban management mainly focussed on exploring new ways to impulse urban development and to push employment growth in which cities could become more competitive places and products of economically rational choices to increase urban wealth (Savini, 2013).

In summary, innovation districts can be seen as top-down initiated urban strategies through government planning; private sector-led developments through corporate leadership; or came into being due to incremental developments based on spontaneous and bottom-up market forces. Within these types of leadership public and private actors like local public authorities, real estate developers and major land owners, but also companies and innovative entrepreneurs or universities are representing the drivers of innovation district developments.

# 3.5 CONCLUSION: THE CONCEPT OF INNOVATION DISTRICTS

In the context of this research innovation districts are acknowledged as economic developments that can spur innovation through 1) networking assets, 2) economic assets, and 3) physical assets raising the innovation profile of a distinct urban area when being *present and well-refined*. Despite the diversity in urban form, certain spatial characteristics of innovation districts are found in multiple typologies. Promoting *attractiveness, urbanity, and proximity* in which the built environment becomes an important resource to not only *facilitate face-to-face contact* enabling the processes leading to innovation but also to stimulate innovation through a *diverse urban setting* which allows knowledge spillovers and to attract talented creative individuals and companies through a *high quality of life*.

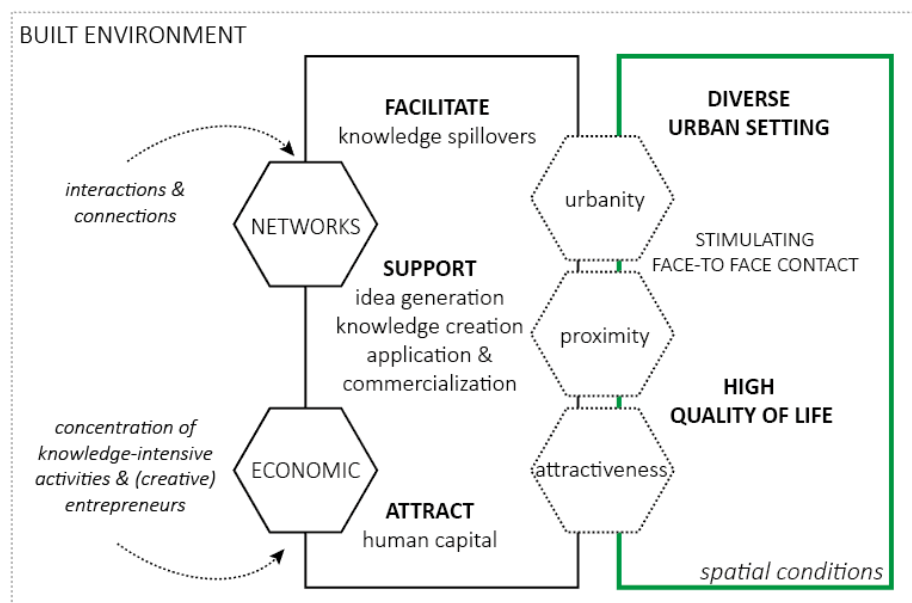


Figure 3.6 Conceptual visualization: Innovation Districts.

As this chapter provides an understanding on the concept of innovation districts and narrowed down the focus of this research, the following chapter will explore more in depth how innovation districts, and similar innovation-rich environments, can stimulate face-to-face contact, create a diverse urban setting, and enhance the quality of life in order to facilitate and stimulate (the processes leading to ) innovation through the built environment.

# CHAPTER 4

## *Changing geography of innovation*

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*This chapter provides insight into the concept of innovation in relation to the built environment. It particularly explores the question how the built environment stimulates innovation.*

### 4.1 INTRODUCTION

Defining the spatiality of the relation between the built environment and innovation on the urban district level is challenging because this relation is mainly analysed in the field of economic geography (on where innovation takes place) and in agglomeration economies (on the role of innovation in the economic development of cities and regions).

In spite of all the research out there the relation between the built environment and innovation has received little explicit attention in academic research (Curvelo Magdaniel, 2016). However, several concepts from theory can be used to explore the ways in which the built environment stimulates innovation. Accordingly they provide an understanding on the 'why' and 'how' innovation districts stimulate face-to-face contact, provide a diverse urban setting, and intent to enhance the quality of life.

First, agglomeration economies have attempted to explain the emergence of innovation clusters in the context of the rising knowledge-intensive economy (1). Secondly, research in urban management contributes to new ways of thinking related to the added value of the built environment in relation to stimulating innovation as a strategic goal (2). And third, inquiries in economic geography provide an understanding on the role of proximity in relation to the processes leading to innovation (3).

Linking these findings to innovation district development and exploring their interrelations reveals important ways in which the built environment stimulates innovation at an urban district level, which is the geographical scope that is central in this thesis. By linking insights from the mentioned fields of study, this chapter will thus answer the following question: *How does the built environment stimulate innovation?*

## 4.2 BACKGROUND:

# INNOVATION CLUSTERS

*The relationship between innovation and space is based on a theoretical assumption that knowledge-intensive activities create spillovers in favour of a companies' innovativeness transferred through tacit knowledge depending on distance or proximity and the process of social interactions.*

based on: (Beaudry, 2009)

Existing research suggests that 'knowledge spill-overs tend to be geographically bounded within the region in which new economic knowledge is created' (Audretsch & Feldman, 1996; Feldman & Audretsch, 1996). In this view, spatial concentration seems to be very relevant in the early stages of innovation when the creation of non-codified knowledge is at the heart of the learning process (Curvelo Magdaniel, 2016). Accordingly, cities seem to provide the right ingredients in which the processes leading to learning and innovation are facilitated. Therefore, companies get more attracted to cities as business location and become more location bounded (Van De Klundert, 2008). These companies find added value of place in the positive effects of colocation with related companies and its access to human capital.

Thus, innovation processes can be enhanced by its location which is shaped by spatial conditions. These conditions define distinct spatial arrangements that may bring forth innovation-rich environments. Different innovation environments, hereinafter referred to as: innovation clusters, emerged over time and have led to the knowledge-intensive environments of today. As cities increasingly initiate the development of science parks, technology campuses, hubs, creative hotspots and innovation districts (Van Winden, W, 2010; Katz & Wagner, 2014) it is important to define these different types of spatial arrangements in relation to innovation that have evolved over time. Within these spatial arrangements companies interact in terms of access, labour supply, venture capital arrangements, access to common (tacit) knowledge, or producer-supplier relations. The innovative capacity of these areas depends on its level of interaction in terms of linkages, local embedment and communication flows. For instance, some innovation clusters are highly integrated in production terms; others are not; some undertake joint marketing and some do not (Hart, 2000).

The *cohesive cluster* derived from research undertaken by Weber (1909) and Marshall (1925) was based on the fact that companies clustered mainly to reduce costs in transport due to the low value-to bulk ratio because of heavy manufacturing goods. Later on, when products became more sophisticated these companies were in need for access to qualified labour. As the economy back then was mainly labour-intensive, these clusters were mostly sector-specific in which companies worked together to optimize the production process and engaged in *collaborative incremental innovative processes* to improve logistics and reduce risks and costs. With the rise of the global economy and advances in ICT economic gravity shifted to *new industrial districts* like Silicon Valley. These areas can be categorized as knowledge-intensive environments with a focus on research and development to create new products mainly through *radical innovations*. These districts entail organisations in which high-speed transport and data exchange are more important than traditional factors as costs reduction in transport or labour (Hart, 2000). The mix of small and large companies; long-standing relations between large corporations and their smaller suppliers; and their joint-effort on projects, creates a relatively stable supply chain which allows companies to deal with the threats posed to them.

During the nineties regional science, largely based on research by GREMI, emphasised the importance of social capital in promoting innovation - *Innovative Milieus*. These clusters are seen as networks based on trust bonds created due to established relations between firms and individuals through previous collaborations. Due to these bonds companies in this type of cluster are willing to *jointly pursue common goals on innovative projects* that may involve risks. Like the cohesive clusters, these milieus are largely based on small and medium sized firms within urban areas that rely heavily on the skills and knowledge of a common workforce (Hart, 2000).



Figure 4.1. Innovation Cluster diversity.

In addition, there are also clusters that are lacking a certain substantial linkage like previously mentioned innovation clusters, but still spur innovation. These are called *proximity clusters* that have no local production network although companies within the cluster are located in relatively close spatial relationships. They are not so much embedded in an area or weakly attached to it; and show extremely limited internal linkages lacking continuing and systematic interactions. These innovation clusters are based on micro-global trading and are more influenced by 'demand-pull' rather than 'technology-push'. In this case, due to the mix of small firms and micro-firms, the importance of *the individual innovator* has begun to re-assert itself in the innovative process within these clusters (Hart, 2000).

Within these different spatial concentrations different innovation processes becomes apparent, ranging from collaborative incremental innovative processes and jointly pursued common goals, to the importance of the individual innovator and radical innovations. In line with Marshalls' theory, the cluster theory of Michael Porter states that a concentration of related companies can exist on a local, regional, national, continental, or even international scale level. In general, companies locate in proximity of each other due to mutual gains and efficiency. Porter's theory adds to that the importance of co-location for renewal and innovation based on collaboration and competition. Besides that, a difference occurs between clusters and networks. First, clusters are mainly about companies and institutions that are physically close to each other and might cooperate, while networks are mainly about companies connected through collaboration rather than geographical proximity. External networks, accidental encounters, tacit knowledge exchange through face-to-face contact can generate new ideas that find diffusion through interactions within the network. However, advances in technology and communication make these knowledge networks less location-based (Boschma R. , 2005).

## 4.3 UNDERSTANDING LOCALISATION BEHAVIOUR IN RELATION TO PLACE

As the rise of innovation districts seems strongly driven by a changing socio-economic context and we are ‘facing a period of demand-driven urban developments in the light of a marginal economic growth’ (Heurkens, 2012) understanding changing location preferences of the actual innovators helps building an understanding on localisation behaviour of companies and individuals in the context of innovation district development. Understanding the relation between *local* – in which the most important innovations and decision-making processes take place, and *global* – the field of competition due to globalisation, is essential to explain how companies choose and value their location in relation to the growing importance of innovation. Accordingly, answering the question: *How can we explain localisation behaviour in the context of the rising innovation economy?*

To help building theory on decisive location factors relevant for top-down initiated innovation district developments that face the risk of being neglected by the actual innovations (Clark, 2016). Because, as most of the competitive advantage of countries and organizations relies on their ability of attracting and retaining talented people, decisive location factors depend on the living and working conditions preferred by the highly-educated worker (Florida, 2010; Curvelo Magdaniel, 2016). According Alfred Marshall (1890) advantages through localisation are about companies from the same or similar sectors that cluster to profit from economies of scale. When these clusters reach a critical mass, they can profit from a specialized labour market, qualified suppliers and the sector specific knowledge spill-overs. In addition, based on the theories of Jane Jacobs (1969) the variety of sectors, companies and people close to one another enhances economic growth and innovation. Due to knowledge spill-overs between different sectors new ideas and new combinations of ideas can arise which lead to innovation. When cities grow in sector and activity diversity, the foundation for innovation and economic growth will increase.

When analysing (neo) classical location theories, the benefits through agglomeration economies are mentioned as agglomerations advantage through localisation when companies operate in the same sector and are in favour of proximity of qualified employees and through urbanisation when companies exchange knowledge and services between different sectors (Atzema, 2012). In this context localisation behaviour is mainly based on cost reduction and revenue optimization taking consumer and competitor behaviour into account (Meijer, 2015). Important location factors defined in these theories are transportation costs, labour costs, and market size.

Location theories

Besides ‘hard’ location factors, like costs and market size, many other factors play a part in determining a business location. According (Atzema, 2012) a lot of companies are lacking accurate information and never make (location) decisions fully rational which lead to suboptimal locations. As irrational considerations and internal factors like age and company size matter in location decisions the behavioural theory on localisation behaviour tries to provide an understanding of the ways companies make decisions rather than focussing on the actual location factors. Path dependency, for instance, is used to explain how decisions are influenced by decisions from the past. Knowledge on the location, its reputation, and stereotypical images determine the subjective perception of the location. Accordingly, the localisation decision is also influenced by the identity of the location, its direct area, and its region (Meijer, 2015).

In the Netherlands a lot of companies are unaware of the location variations that do matter in terms of local differences when choosing the optimal business location (Meijer, 2015). According (Atzema, 2012) especially small companies choose for a familiar environment and re-locate when needed within the district or region. Companies attach great value to ‘soft’ location factors like the quality of place.

‘soft’ location factors by Jansen (2009)					
Building	Direct area	Socio-economic	Living environment	Institutional support	Personal
prestige	pleasant living environment	work ethic population	beauty of scenery	accessibility	Personal motivation
representativeness	liveliness	International perspective	visual attractiveness	quality of information	
recognizable structure	attractiveness of place	reputation of the region	buildings		

*Table 4.1 11 ‘soft’ location factors by Jansen, 2009*

Besides that the importance of certain location factors depends on the geographical scope – local, regional, national, or international – in which a factor is considered. According (Jansen, 2009) it is more likely that when a company seeks a location within the Netherlands it will select the region first, looking at specific regional advantages, before focussing on the building specifications. However in practice the sequence of these steps can defer remarkably and advantages on the building or local scale can compensate for weaknesses on the greater geographical scale.

Localisation behaviour can also be viewed from the social and institutional context of localisation decisions. These decisions are influenced by formal institutions in terms of policies and legislations but also by informal institutions in terms of standards and common practice (Meijer, 2015). Besides that the ongoing interactions and negotiations with consumers, companies, competitors and organisations effects the localisation decision as well (Pellenbarg, 2002).

Accordingly, in order to survive companies have to adapt to economic, societal, and technical changes emphasized in evolutionary location theories. As the when and where of innovation processes that occur during business activities is not fixed, companies choose their location conform the ‘window of locational opportunity’ (Boschma, 1997) in which interactions and collaborations between different actors is important. Because, proximity of partners, suppliers, consumers and knowledge institutions provides cluster and network advantages in which companies can learn from one another (Meijer, 2015). Unfortunately this approach is mainly focussed on the evolution of new sectors within regions rather than the process of localisation decisions by existing companies.

Nevertheless, the location theories elaborated on above provide an understanding on distinct location preferences related to decisive location factors to be taken into account when explaining the added value of place and location preferences by the actual innovators in the context of innovation district development (Appendix A).

## 4.4 DEFINING THE CONCEPT OF INNOVATION

Before elaborating further on the relation between innovation and the built environment, we need a definition of the term innovation. The term innovation has many definitions in academic literature, starting with Schumpeter in the late 1920s. He stated that innovation is reflected in novelties: new outputs ranging from new goods, new methods of production, to a new market or a new organizational structure. Nowadays, innovation is seen as a more complex and interactive process, constantly subject to change. In the context of this research, innovation is more than a creative process and includes application by the commercialisation of creativity. In this thesis, the processes leading to innovation are perceived to include internally conceived and externally adopted ideas. This leads to the definition by (Crossan&Apaydin, 2009) 'Innovation is: production or adoption, assimilation, and exploitation of a value-added novelty in economic and social spheres; renewal and enlargement of products, services, and markets; development of new methods of production; and establishment of new management systems. It is both a process and an outcome.'

Dimensions of  
innovation

**Simplified;** *'innovation is about the commercially successful exploitation of new technologies, ideas or methods through the introduction of new products or processes, or through the improvement of existing ones. It is a result of an interactive learning process that involves often several actors from inside and outside organisations'*

(EC, 1994)

A comprehensive understanding on the concept of innovation is needed because innovation is important both as an activity in its own, and as a spur to economic development and competitiveness in general. Besides that, innovation is not an isolated event but depends on its context in terms of the processes leading to innovation as well. According to (Hart, 2000) the following dimensions of innovation are important to take into account.

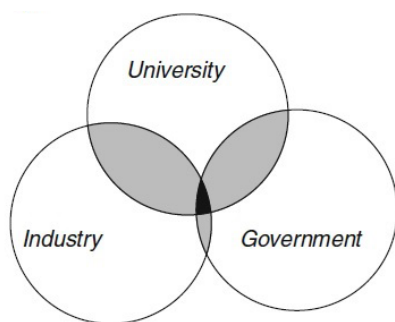
- Innovation is a commercial concept not simply a technological, or even an intellectual property one. However novel an innovation is, companies must be able to successfully exploit their innovation in commercial terms.
- There are degrees of innovation. The innovative process can involve the creation of complete new products or services or, more commonly, simply the improvement of existing products and services. Innovation can thus be radical or incremental in character.
- Innovation, regardless its degree, normally arises due to collaboration in which individuals working in groups have learned from each other how new or improved goods and services can be created and commercially exploited.
- The basic unit of an innovative process is not necessarily an individual, or even an individual company working in isolation, it is a network of individuals, or firms, working together to produce the innovation.



- Innovation processes entail an implicit dimension, namely spatial location. Location seems important, as certain areas are more innovation-rich than others. Just as there are different degrees in innovation there are also different types and degrees in spatial arrangements differing in type of linkages.

Organizing  
innovation  
through  
collaboration

Initially innovation was seen as an individualistic activity carried out by individual innovators and inventors. Currently, with the growing advances in communication and technology the process of innovation has become more complex and is seen more as a collaborative activity. Spatial aspects become more important in the process of innovation due to this collaboration approach – ranging from production arrangements in small and medium-sized companies at the local scale, to trading activities of multinational corporations at the global scale (Hart, 2000).



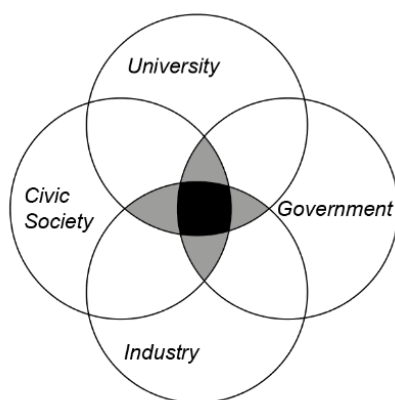
In line with this collaborative approach innovation increasingly involves the interaction between knowledge institutions, companies and public authorities. Referred to as the university-industry-government relationship – the concept of the Triple Helix (Etzkowitz, 2008). The Triple Helix states that the potential for innovation and economic development resides in the capacity of these three spheres to generate new institutions and social formats for knowledge creation, diffusion and application (Curvelo Magdaniel, 2016).

Figure 4.2. Triple Helix (Etzkowitz, 2008)

*‘A successful innovative environment requires organisation in which companies, knowledge institutions, and government work closely and moves along with time.’*

(Lekkerkerker & Raspe, november 2016)

To coordinate the process of innovation and stimulate triple helix collaborations distinct organisations are created ranging from regional economic boards like in Amsterdam, Twente, and Groningen, to development companies like Brainport Development Eindhoven. Within these organisations civic society is not equally supported yet. According Carayannis and Campbell (2009) democracy plays an important part in creating the right conditions that spur innovation.



Therefore citizen participation; the involvement of social entrepreneurs; and bottom-up civic initiatives have the potential to spur new knowledge and innovation and create new opportunities for market, knowledge, and network spill-overs in which social issues are being addressed as well. In this context, we do not speak of triple helix collaborations but of a quadruple helix. In these collaborations top-down, mid-level-out and bottom-up approaches between public authorities, knowledge institutions, companies and civic society become apparent (Lekkerkerker & Raspe, november 2016).

Figure 4.3. Quadruple Helix. (Etzkowitz, 2008)

Triple helix and quadruple helix strategies are promoted outlining the partnerships, relations, and organisations needed to facilitate and stimulate innovation as innovation shifts towards a more complex and collaborative process. These models however have no precise physical dimension but are determined by its distinct geographic features (Etzkowitz & Klofsten, 2005).

The growing complexity in the process of innovation; the expanding number of stakeholders involved ranging from triple to quadruple helix interactions and relations; and the rise of distinct geographical typologies in innovation strategies ask for suitable measures to indicate innovation. R&D data is considered as a limited indicator because it focuses mainly on the measurement of an innovation input and many other supporting activities fall outside the narrow definition of R&D used to measure innovation (Curvelo Magdaniel, 2016). Patent data, on the other hand, is a consistent indicator because it gathers detailed information about new technologies as a public record of inventive activity. Although it has some weaknesses as it mainly indicates inventions instead of innovations (Smith, 2005).

Measuring innovation as process and product

Output indicators measuring innovation as product, like patents, stress innovation as a product by the innovator while input indicators, like R&D investments, measure the conditions leading to innovation. In the context of this research the physical conditions of these indicators are interesting as they indicate the processes leading to innovative output through the built environment. Curvelo Magdaniel (2016) defined several input and output indicators measuring innovation as a process and product that help to quantify the concept of innovation. Her input indicators—the *quality of life*, the *quality of accessibility*, *connectivity*, and *mobility*, and the *capacity of research infrastructure*<sup>7</sup>—entail a spatial dimension.

Nonetheless, innovation is not simply a technological or intellectual property as the capacity of research infrastructure, which mainly indicates knowledge creation and diffusion, may imply. In the context of this research, knowledge application becomes equally important. Meaning that innovation is seen as a commercial concept in which the ability to improve innovation in a distinct urban area relies on the presence of organisations and individuals that can successfully exploit innovations in commercial terms for present purposes.

Defining the concept of innovation

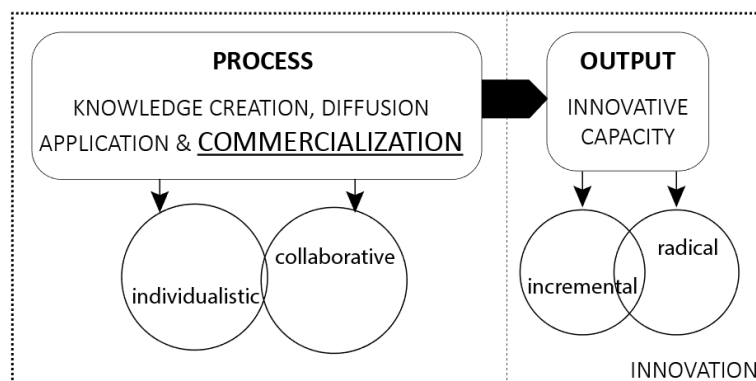


Figure 4.4. Conceptual visualisation: innovation.

Accordingly there are degrees in innovation ranging from radical new inventions to incremental product and process optimizations explored by a network of firms working together or conceived of by an individual innovator. Due to the growing advances in communication and technology the processes leading to innovation have become more complex and are seen more as a collaborative activity influenced by spatial conditions that determine the geographical scope of distinct innovation models ranging from triple helix to quadruple helix interactions ( Figure 4.3).

<sup>7</sup> **Research infrastructure:** the program, amenities, and facilities (e.g. research centres, incubators, universities, testing fields/labs) providing a supportive environment that facilitate (the processes leading to) innovation.

## 4.5 STIMULATING INNOVATION THROUGH THE BUILT ENVIRONMENT

Economic  
geography

In the context of this research, ‘stimulating innovation through the built environment’ is mainly explained by research on where and why innovative activities take place – from the research field of economic geography. Within this field of research, the perspective on innovation eco-systems<sup>8</sup> addresses the importance of networks and collaboration, linking innovation to many other interesting elements equally important in innovation cluster developments as its physical dimension itself. Nevertheless, this chapter tries to isolate the physicality of the processes leading to innovation to outline the relation between innovation and space.

*The innovation processes explained previously can be enhanced by its spatial dimension which is shaped by its location and spatial conditions. These conditions define distinct spatial arrangements that may bring forth innovation-rich environments.*

Geographical  
proximity

Existing research suggests that ‘knowledge spillovers tend to be geographically bounded within the region in which new economic knowledge is created’ (Audretsch & Feldman, 1996; Feldman & Audretsch, 1996). In this view, spatial concentration seems to be very relevant in the early stages of innovation when the creation of non-codified knowledge is at the heart of the learning process (Curvelo Magdaniel, 2016). As innovation is stimulated by social interactions as face-to-face contact, repetitive face-to-face contact is essential in order to stimulate innovation and transfer knowledge (Bathelt, 2004). In the process of knowledge creation and diffusion, multiple dimensions of proximity make interpersonal interactions and collaboration possible. Geographical proximity, in this context, facilitates the flows of tacit knowledge by means of face-to-face interactions and collaborations among knowledge-intensive networks (Audretsch & Feldman, 1996; Boschma, 2005; Curvelo Magdaniel, 2016).

Cities seem to provide the right ingredients in which these dimensions of proximity are present and in which the processes leading to learning and innovation are facilitated. In response to this, companies seem more attracted to cities as business location and become more location bounded, despite globalisation processes that provide companies the opportunity to become more footloose (Van De Klundert, 2008). These companies find added value of place in the positive effects of colocation with related companies and its access to human capital.

Innovation as  
organisational  
performance

The process of innovation requests organisations to engage in activities involving risks and uncertainties while organisations traditionally seek certainty in their operating environments for profit and planning purposes (Cyert, 1963). To overcome uncertainties, share risks, and increase efficiency, innovation can be promoted in agglomeration economies or in spatial concentrations. But innovation can also be viewed as an organisational goal from the perspective of individuals, companies and organisations stressing innovation as a source of competitive advantage.

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<sup>8</sup> **Innovation ecosystems:** In economic geography the relationship between innovation and the built environment is discussed through the importance of knowledge spillovers explaining the concentration of innovative activities in particular places – referred to as innovation eco-systems.

*‘To stimulate innovation as a strategic goal the built environment forms an important resource as innovation entails a spatial dimension enabling knowledge creation and diffusion.’*

(Curvelo Magdaniel, 2016)

In the field of urban management, the built environment is seen as a resource that can be managed to stimulate innovation. Assuming that ‘decisions and interventions in the built environment can facilitate conditions required for innovation in the context of the knowledge-intensive economy’ (Curvelo Magdaniel, 2016). The allocation of resources, for developing the built environment with the expectation to benefit from it; stimulating innovation as a strategic goal; and accommodating activities operationalizing that goal define the view from this urban management perspective explored in this chapter.

In this context, there are different ways in which the built environment can stimulate innovation; add value<sup>9</sup>; and fulfil organisational goals by means of location decisions and urban interventions related to interior design, facilities, and location or by the provision of - and access to amenities.

As the processes leading to innovation rely on attracting and retaining high-skilled people needed for knowledge creation and its application but also on the ability to adapt to changes ‘flexibility’, ‘image’, and ‘user’ satisfaction become increasingly important aspects of organisational performance as well as ‘innovation’ (Curvelo Magdaniel, 2016). Accordingly innovation can be stimulated through *shared amenities*, *flexible facilities*, and *physical connections* as a result of location decisions and physical interventions (Curvelo Magdaniel, 2016; Lekkerkerker & Raspe, 2016):

- location decisions on the urban area level facilitating the long-term concentration of innovative organisations;
- physical interventions on the building level facilitating the climate for innovation through design and building qualities (e.g. modularity, standardisation and openness);
- location decisions and interventions on the urban district level supporting image and accessibility by emphasizing the district identity, scale and connectivity features;
- and, location decisions and interventions on the urban district level enabling the access to amenities to increase the diversity of people and density of social interactions.

Based on these findings the built environment can stimulate innovation by 1) facilitating knowledge-intensive and innovation-rich activities through spatial concentration; 2) enabling knowledge spillovers through proximity within a supportive environment; 3) attracting human capital through a supporting image and accessibility by emphasizing the district identity, scale and connectivity features.

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<sup>9</sup> **Added value:** In this context added value of real estate can be seen as a course of action on real estate that attempt to fulfil an organisational target. Aspects of organisational performance reviewed in literature are besides innovation, costs; real estate value; risk control; flexibility; productivity; user’ satisfaction; image; culture; and sustainability, (Den Heijer, 2011).

# 4.6 SPATIAL CONDITIONS

## ACTIVATING INNOVATION DISTRICTS

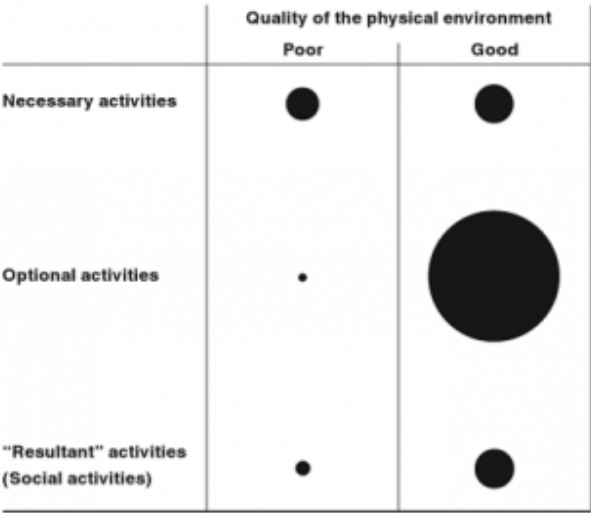
The previous chapter shows that stimulating innovation through strategic courses of actions guide location decisions and physical interventions. In relation to innovation districts, these decisions and interventions result in innovation-rich environments in which face-to-face contact is stimulated and human capital gets attracted. What these location decisions and physical interventions are and why they are important will be discussed here.

Diverse urban  
setting

Innovation districts should reflect the city 'as social entity in which the district is as diverse as possible, walkable, interesting, and fosters social life' (Jacobs, 1961). They must be dense, compact (short street blocks), balanced (in historical and modern architecture) and mixed in use while providing a high quality of life (Katz & Wagner, 2014; Morisson, 2015). These aspects are important because they all reflect the spatial environment in which innovation and the processes leading to it are facilitated by activities that are necessary, optional, or social – in favour of knowledge creation and diffusion. When these environments do not match with the perception of a good environment, less interactions are likely to occur (figure 4.6) because 'in a good environment, a completely different, broad spectrum of human activities is possible' (Gehl, 2006).

In addition, *diversity* and *proximity* within urban areas is important for the local economy because it enhances cross-fertilisation and makes interactions easier, cheaper, and more effective (Lekkerkerker & Raspe, november 2016). However, these local dynamics are not enough. Due to globalisation knowledge exchange between local and international networks has become easier but also more essential to keep up the competition.

Figure 4.5 Relationship between quality of environment and human outdoor activities (Gehl, 2006).



These local dynamics and international connectivity, both physically and through networks, are enhanced by *co-location* that stimulate face-to-face contact. Referring to the mechanisms that support social interactions and facilitates the exchange of personal and complex knowledge as a result of education and competencies. Besides co-location can also reduce overhead costs through the availability of space below rate, low risk work spaces and technical spaces where expensive technologies are shared.

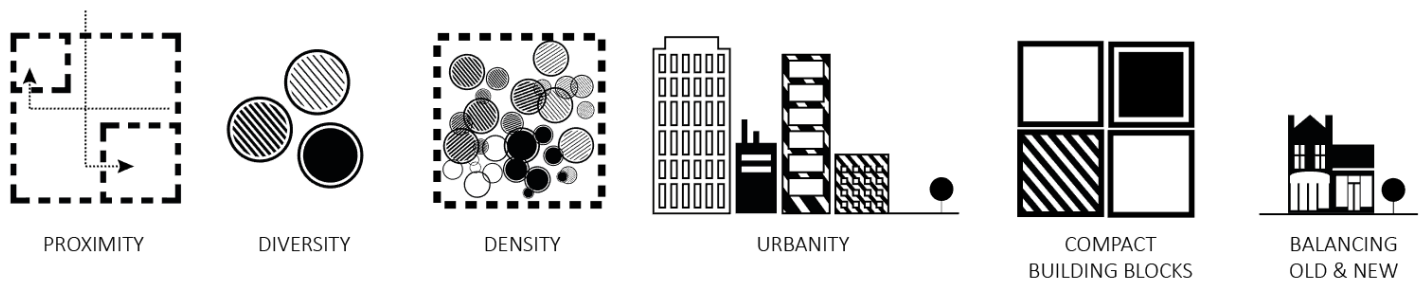


Figure 4.6. Conceptual visualization: diverse urban setting.

According Venables and Storper (2003), the mechanisms that support social interactions can be reached through formal or informal; intended or accidental; and planned or coincidental interactions. Informal spaces like coffee shops, bars, parks and restaurants brought more ideas than conventional seminars in the case of Silicon Valley between 1970-1980 (Castells, 2011). To enhance these interactions a diverse urban setting helps nurturing the innovation system. Which needs a healthy blend of small, medium-sized and large firms in favour of ambitious entrepreneurship (Katz & Wagner, 2014; Morisson, 2015).

In the context of this research, entrepreneurs can be seen as leaders in the commercialisation of new ideas driven by public authorities, investors, and knowledge institutions which provide the right conditions in terms of essential physical infrastructure, supportive legislation, and a stimulating local culture. Besides, in order to attract and retain not only entrepreneurs but also the creative class, which is seen as a driving force behind innovation, an innovation district must provide inspiring (cultural) facilities like museum, street art, restaurants, bars and pop-up events. Because, *vibrancy* in general is needed to attract young, creative human capital and facilitate the exchange of knowledge.

Vibrancy

***'If a city's streets looks interesting, the city looks interesting; if they look dull, the city looks dull'***

(Jacobs, 1961)

So, to stimulates innovative thinking and knowledge spill-overs innovation districts have to be vibrant. Besides, to create diversity a constant flow of people is needed to provide a sense of safety which enhances a vibrant social and cultural scene. Due to sufficient diversity at a street-level, residents can also build a sense of community and trust among each other (Morisson, 2015). Accordingly, *authenticity* by preserving historical buildings and iconic structures can enhance a unique identity in favour of the *attractivity* of a place. In addition, city residents are actively invited due to a diversity through mixed-use planning and attractivity by qualitative public spaces in combination with vibrant streets and public amenities.

As entrepreneurial creatives favour *urbanity*, innovation clusters like innovation districts, are mainly located close to or within cities (figure 4.7). Popular cities in The Netherlands, like Amsterdam, Utrecht, and Rotterdam, encompass a vibrant daily urban system with a wide range of agglomeration advantages, in which companies can easily share (connectivity and accessibility), match (wide and highly specialized labour market) and learn (human capital, and distribution of information and knowledge through face-to-face contact).

Vibrant daily urban systems



Figure 4.7. Vibrant daily urban systems.

Attractivity

Attractivity and diversity of place are essential to attract and retain talent (Lekkerkerker & Raspe, november 2016). However *attractivity* and diversity preferences can vary per sector. Innovation processes in the creative sector – *divergent ‘out-of-the-box’ thinking* – are different than more science and technology driven innovation processes – convergent ‘solution-targeting’ thinking – and therefore entail different people-based and place-based preferences that stimulate the right type of proximity.

For example, Betas prefer quiet and green landscapes while creatives, on the other hand, alfas and gammas often have a larger social network; live closer to work suggesting that work and private life are more mixed; in favour of amenity-rich environments that provide multiple options for interaction (Spencer, 2015). According Katz & Wagner (2014) this cultural trend is not only about providing an environment that stimulate face-to-face contact. It is about the growing importance of the quality of life and its working environments. Nowadays places are more about the experience in itself than its practical usefulness.

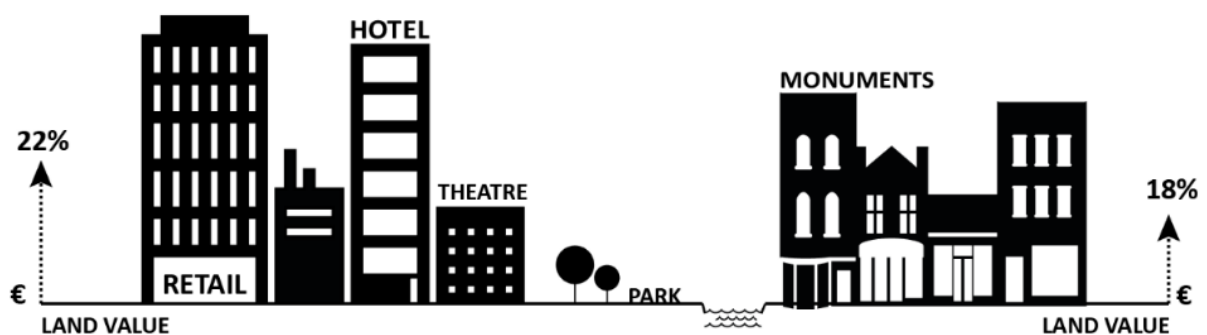


Figure 4.8. Conceptual visualization: quality of life.

Quality of life

This trend becomes apparent in increasing land value due to cultural and leisure facilities in which 22% is driven by hospitality amenities, performance arts, and luxury retail while another 18% is driven by the presence of national monuments, proximity of parks, nature, sea or historic canals (CPB, 2015). In this context, restaurants, coffee shops, and bars ‘reflect not only contemporary urban consumption patterns but also a distinctive ‘geography of amenity,’ which complements the intensive social interactions of the new economy (Hutton, 2008).

Besides hospitality facilities, neighbourhood-building amenities are also important as they provide important services to residents and workers. This includes medical offices, grocery stores, restaurants, coffee bars, small hotels, and local retail – such as bookstores, clothing stores, and sports shops. These amenities are important because they can ‘activate district streets and public spaces, inviting a mix of people to shop, browse, and mingle’ (Katz & Wagner, 2014). In addition, as city residents especially millennials, prefer communities with street life, innovation districts should also promote safe, comfortable, and interesting walk and bike routes (Speck, 2013). Because for instance, *walkability* and *bike-ability* can provide the potential for unexpected encounters. Besides that, *connectivity* should also provide fast and comfortable connections by public transport and car with access to frequent air or other international connections.

Physical connections like these enable people to meet but can also increase the opportunity to keep people informed. Besides, enabling access to increase diversity and density of social interactions entails ‘an important social component because knowledge sharing and idea generation are strongly tied to social interactions and trust developed among innovators through frequent interaction (i.e. socially proximity). Accordingly, the more amenities, the more mix of uses and then, the more chances for interactions that can generate ideas and knowledge spillovers. Furthermore, providing sufficient and varied amenities increases the attractiveness of a location for individuals and organisations next to other quality of living indicators’ (Curvelo Magdaniel, 2016).

Connectivity



Photo 4.1. City Branding I amsterdam. (Verhart, 2013)

Due to the changing role of cities in economic development and the growing competition between cities nationally and internationally, attractiveness has become a benchmark for success (Lekkerkerker & Raspe, november 2016). In response, branding has become a tool to influence the dynamics of economic processes by ‘drawing attention and promote and profile yourself – as nation, region, district or company – to attract companies, residents and visitors’ (Paul, 2004). But branding can also be used for social causes like local awareness, pride, self-esteem, and commitment to enhance collaboration and community building (Warnaby, 2015).

City branding

Spatially this type of place branding & city marketing is enhanced by signature architecture and public space; public showcases & living labs; physical signing campaigns like IAmsterdam and I♥NY; and placemaking through cultural or sport events. *Placemaking* and *district branding* include the strategic use of urban design elements ranging from building facades to street design, public spaces and landscaping; and not only promote but also display quality of life matching district activities.



Place branding can be enhanced by linkages with other strong brands like MIT as part of the university consortium behind Advanced Metropolitan Solutions (AMS) and Cambridge Innocation Centre (CIC) of by events like TEDx of Start-up Delta initially to expand and combine networks. Besides, opportunities for branding also lie in intertwining physical branding strategies with its digital ones and creating a unique branding by incorporating the local culture, qualities and stakeholders (Andersson, 2015).

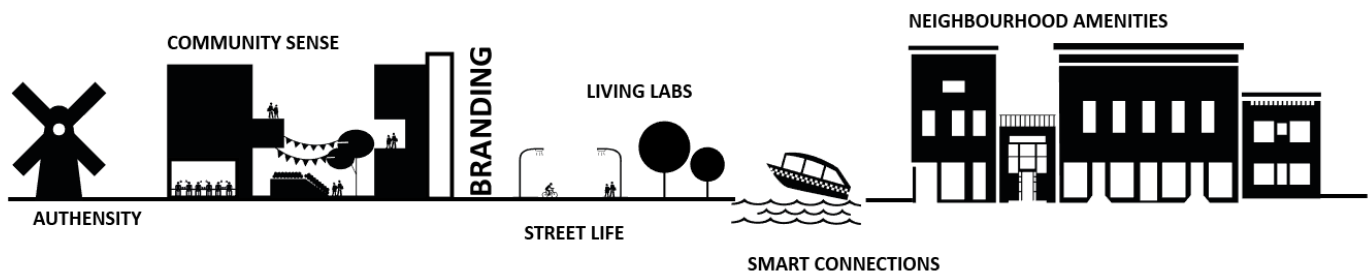


Figure 4.9. Conceptual visualization: quality of life.

Similar to open innovation between firms, innovation districts are experiencing the breakdown of traditional boundaries, making the process of innovation more porous between the public and private realms (Katz & Wagner, 2014).

*The changing geography of innovation – from closed to open processes and influenced by the density of social interactions – alters the design of office spaces, reshapes the relationship between buildings, and now occurs at the urban district scale.*

The activities between these public and private realms are enhanced through spatial interventions, stimulating innovation through the built environment by means of (Curvelo Magdaniel, 2016; Lekkerkerker & Raspe, 2016):

- interventions on a building level concerning architecture and interior design (modern transparent buildings, and flexible lay-outs);
- unique landscaping, attractive pedestrian friendly routes, and attractive places in public space on the urban district scale;
- through strategic planning by defining and concentrating supporting facilities, hospitality amenities, and centralized parking facilities;
- and through physical nodes by means of attractive meeting points, platforms for formal and informal interactions, and shared and flexible workspaces.

Facebook and Google, for example, have embraced “hackable buildings,” with open floor plans that can be easily reconfigured to create dense, collaborative spaces for new teams and projects (Katz & Wagner, 2014). Accordingly, formal spaces for collaboration, like co-working places, libraries, shared laboratories, and fab labs, can foster collaboration between knowledge-intensive companies. Besides, streets can enhance stimulating knowledge spill-overs by transforming them into living labs to flexibly test new innovations. Like in Boston, Barcelona, Eindhoven, Helsinki, and Seoul, where streetscapes and public spaces are testing grounds for new innovations in street lighting, waste collection, traffic management solutions, and new digital technologies.

Supportive  
environment

Living labs are what 22@Barcelona calls ‘open innovation at the city-scale’ (Katz & Wagner, 2014). These activities also stimulate *face-to-face contact* through street life; help building a community sense; and attracts visitors. Besides that the availability of spaces for collaboration can accelerate the processes leading to innovations.

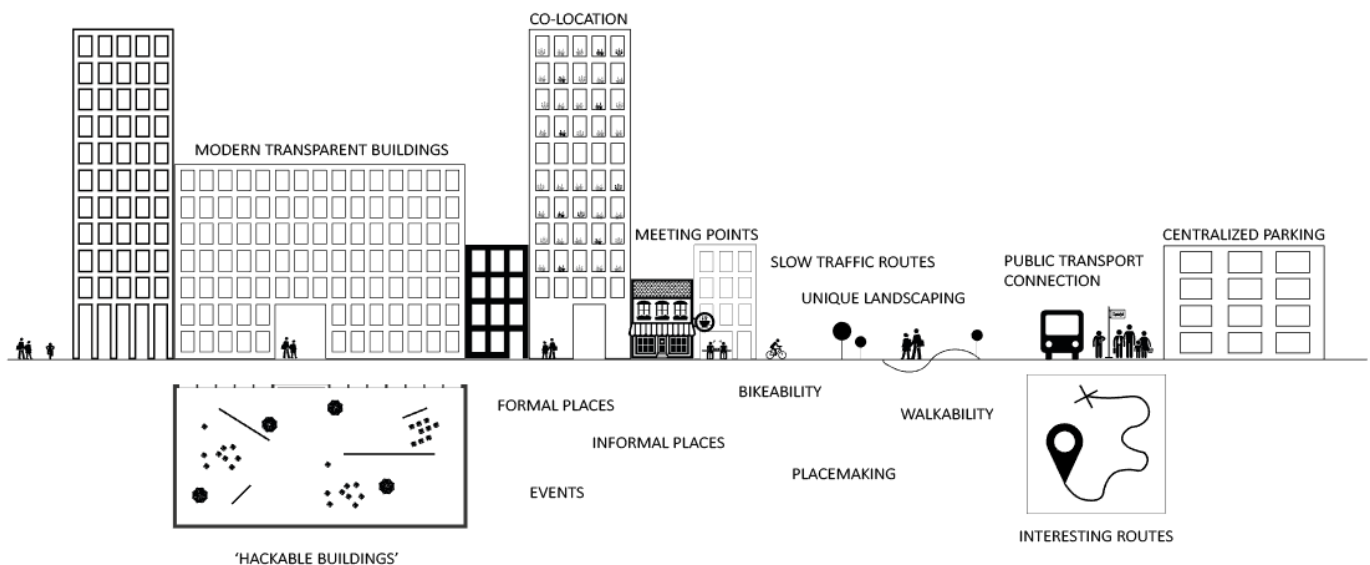


Figure 4.10. Conceptual visualization: supportive environment that stimulates face-to-face contact.

In relation the spatial conditions that stimulate face-to-face contact within the direct surroundings in which knowledge-intensive activities take place, *proximity* becomes an important catalyst in stimulating knowledge spillovers and can be seen as a distributor of tacit knowledge and an intensifier of face-to-face contact. This makes tacit knowledge besides context-dependent also location-dependent, explaining the clustering of knowledge-intensive activities in specific locations. Accordingly, *connectivity* and *geographical proximity* facilitate face-to-face contact in which tacit knowledge is exchanged, essential to the process of innovation.

## 4.7 CONCLUSION: STRATEGIC USE OF THE BUILT ENVIRONMENT

Areas allocated as innovation districts in the model of re-imaged urban areas, ex-industrial, and urbanized science and technology parks represent urban (re)development projects in which planning and managing common affairs have become complex. In addition, stimulating innovation is about stimulating innovation as an activity to spur economic development and competitiveness on the urban area level than as an activity on its own at an organisational level. Moreover, these projects involve multiple public and private actors. Therefore, it must be acknowledged that to provide an understanding on the relationship between innovation and the urban district level, the perception and valuation of innovation by multiple stakeholders is important to determine before being able to define the actual contribution of location decisions and spatial interventions in stimulating innovation.

Nevertheless this exploration on the changing geography of innovation showed that the added value of the built environment in stimulating innovation can be understood as the combined effect of interdependent strategies that have the potential to stimulate innovation directly (through innovative output as shown in the diversity of innovation clusters); 1) or indirectly (through innovative input in which the built environment contributes to the processes of knowledge creation, diffusion, application, and commercialization) 2).

- 1) the built environment as facilitator of knowledge-intensive and innovation-rich activities through spatial concentration & knowledge spillovers through proximity;
- 2) the built environment as enabler of the processes of knowledge creation, diffusion, application, and commercialization.

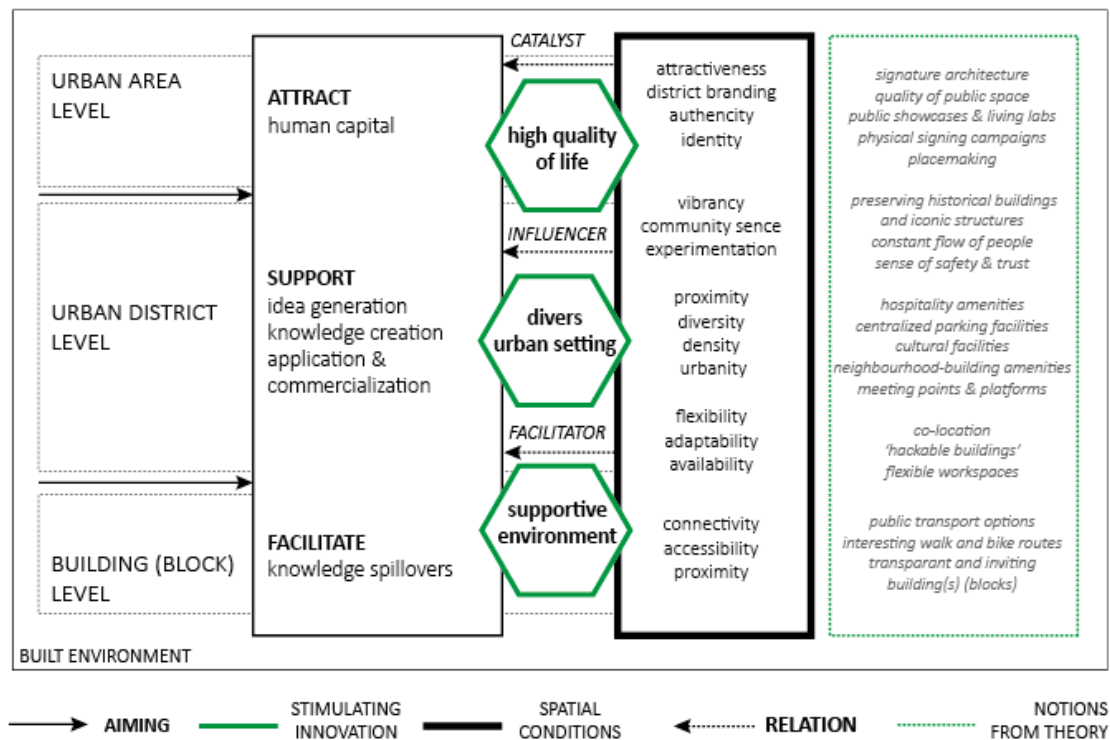


Figure 4.11. Conceptual model: innovation & the built environment

When focussing on the built environment as enabler, strategies that influence the processes leading to innovation (e.g. flexibility, identity and diversity) should be explored as well. To conceptualize the ways the built environment can enable innovation several notions are frequently used in theory referring to the importance of the quality of life 1), the potential of a diverse urban setting 2) and the essence of a supportive environment 3). In this respect stimulating innovation can be viewed as strategic courses of actions guiding location decisions of knowledge-intensive and innovation-rich activities in combination with location decisions on effective spatial conditions and physical interventions.

Physical interventions that can spur innovation on the urban district level are very context-specific in order to facilitate idea generation, attract human capital or enhance knowledge spillovers. Nevertheless these notions from theory (based on multiple planning examples) provide an understanding on physical conditions helpful to stimulate innovation through the built environment (figure 4.11).



# CHAPTER 5

## *Innovation District development*

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*This chapter provides insight into innovation district development. It particularly explores the question what roles are deployed by local public authorities in innovation district planning and development.*

The concept of innovation districts has been applied to many European and American cities, initiated and promoted as urban policy fostering economic growth. As many cities try to replicate top-down initiated best practices this chapter explores the roles deployed by local public authorities in innovation district planning. To answer the question: *What planning approaches are deployed in innovation district development projects?*

Accordingly this chapter explores the development and organisation of innovation districts discussed in theory and effective planning approaches based on theory deriving from the field of urban management and urban studies on building the innovation economy.

## 5.1 CONTEXT: URBAN DEVELOPMENT PRACTICE

Urban  
management

As cities must continuously adapt to new socio-economic demands and needs, urban management is needed to set a framework for urban development and to adopt an integrated and durable approach to issues of function, space and society. Urban development in the context of this research can be seen as planned spatial interventions including several processes to form and shape the innovation district within the city.

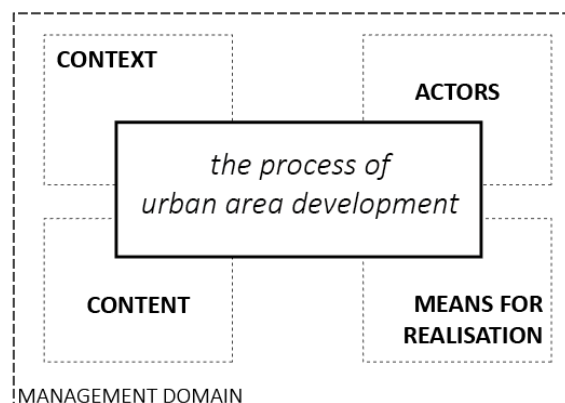
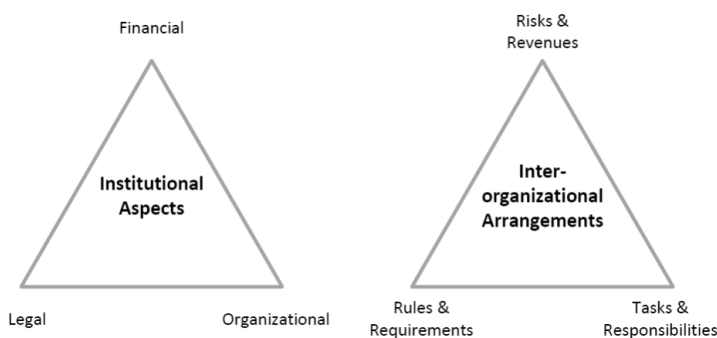


Figure 5.1. Conceptual visualization: urban area development. Based on Van t' Verlaet, 2008

The context of an area very much determines the planning approach necessary for urban area development. Without a clear understanding of context, urban area development projects lead to a less than optimum result or are even doomed to fail ('t Verlaat & Wigmans, 2011). Influential aspects demanding special attention are economic developments, social developments, policy and judicial context, and the level of participation by the involved actors. Besides, urban area development projects are increasingly about the redevelopment of existing urban areas, like the re-imaged urban area model in innovation district development. In a redevelopment project it is important that spatial quality, market quality and the allocation of means is optimised and the involved parties, both public and private actors, collaborate effectively; are in attendance of organisational expertise; and have a clear communication strategy to generate support for the project ('t Verlaat & Wigmans, 2011).

*The recession has revealed that established ways of thinking and acting in urban development practice are being questioned.*

As addressed in the introduction of this thesis, roles deployed by public and private parties and their relationships in spatial planning have changed, enlarging the scope of urban development projects and making it possible to compensate public land development costs with land transaction revenues made by private actors. Besides, 'within these projects a joint public-private effort is made to link spatial policies more close to project implementation' (Daamen, 2010).



To understand collaborative relationships, insight into partnership characteristics is essential (figure 5.5). Institutional aspects help to get a grip on the cooperation structure and processes while inter-organizational arrangements help understand the attribution of different project necessities to public and private actors within projects.

Figure 5.2. Organizational aspects of partnerships. Heurkens (2012)

Within urban development projects, in the context of top-down initiated innovation districts, added value for the project is to be expected from the involved actors. This can be found in efficiency, effectiveness and innovation in the form of financial means and market knowledge. But it can also be found in more flexibility to react on changing political, environmental, and societal circumstances (Klijn & Twist, 2007). Teisman (2008) addresses several reasons why added value in these partnerships is so hard to reach. First, more efficiency and effectiveness is not always reached because of the differences in objectives and interests. The public sector is viewing urban development projects in terms of safeguarding public interests as safety, health and democracy while the private sector is mainly interested in obtaining a decent profit safeguarding for the continuation of the firm.

Besides that common objectives have to be found within the inter-organizational entity. The lack of a clear role description often results in a discussion which actor is actually accountable for what issues (Heurkens, 2012). When actors within partnerships act on the 'edge' of public and private domain it turns out to be very difficult to divide responsibilities as the borders between what is public and private become blurred. Resulting in challenging negotiation processes to reach agreements on sharing risks and revenues and ways to safeguarding actor-specific interests.

What makes it even more difficult is that a simple rule applies; the one that pays also likes to decide. Spatial policies, plans and projects are the result of these negotiation process in which local authorities are no longer obviously 'in the lead'. Private actors, community groups and other public bodies have all become participants in an on-going quest for improving the way land is being used and developed (Heurkens, 2012). Besides that, partnerships can be hindered by misconceptions causing bias towards one another on the roles and motives of parties and resulting in distrust. Because of hidden agendas used by one or both actors distrust can occur; and sometimes a lack of transparency can create a very contra-productive situation (Heurkens, 2012).

***As both public and private actors have a financial stake, and basic public and private objectives often are hard to match, negotiation and decision-making processes are seldom efficient and effective.***

Accordingly, urban development projects can be conceptualized as a political problem comprising a combination of financial and economic priorities of investors; the redistributive ambitions of local authorities; and the electoral implication that growth has on socio-economic change. These aspects create a specific combination of planning challenges which ultimately determine whether, how, and what type of planning model is needed (Savini, 2013).

These planning challenges can be explained as follows (figure 5.3). Urban development projects in former industrial areas imply the involvement of significant initial investments because financial costs of land re-use for soil sanitation, real estate development, and return on investments can be expected (property development). In addition, these areas form a key opportunity for local municipalities to regenerate their economic wealth aiming for development earnings to be redistributed to communities in the form of public services, infrastructures, or fiscal advantages as collective benefits. Besides that these projects have a serious impact on the social, cultural, and environmental dynamics that, in return, affect the composition of local communities. A rent gap could, for instance, attract new investors seeking opportunities for alternative economies that attract new social profiles with different living styles and demands. This can cause tension between the imperative to protect local communities from gentrification or displacement and the need to attract new forms of living and production (Savini, 2013).

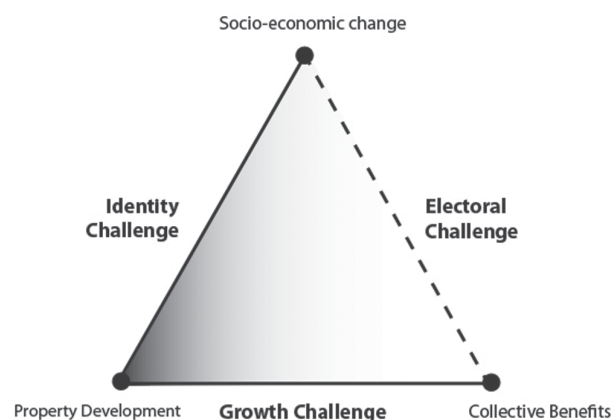


Figure 5.3. Interlocked planning challenges. Savini, (2013)

Thus, land (re)development can have major social costs, especially in (former) industrial areas. Therefore activating innovation districts through land development in former industrial challenges brings urban change and also socio-economic change posing political risks in the shift from production to consumption, from work to living, or even from factories to entertainment amenities (T. N. Clark et al. 2002).

The public sector cannot always easily react on these changing circumstances as the city council is supposed to operate according to electoral mandates and act based on consensus consolidation. Accordingly as urban change brings forth socio-economic change it can be difficult for local polities to protect the interests of its constituents. Urban development projects are characterized by a long term project time span and therefore often face several political elections. This can cause political priorities to change and often results in the adaptation of functional spatial programs. Better known as the problem of political discontinuity (Heurkens, 2012).

***It can be stated that (changing) local politics have a major impact on a development and can be avoided by looking at organizational models in which politics are more clearly separated from daily urban development project organizations (De Zeeuw, 2007).***

Accordingly, local authorities need to find a balance between the need of private investors to generate profit from the development and their contribution to collective benefits as public amenities. For example, by means of urban governance meaning the 'capacity to organize collective action towards specific goals' (Hillier, 2002). This term came into use in the nineties referring to public-private-civic relations that deal with a management task of political, economic, social and administrative nature. As a 'sum of the many ways individuals and institutions, public and private, plan and manage the common affairs of the city' and have become critical for sustainable urbanization (Habitat, 2009). In the context of partnerships engaged in urban development project Banachowicz & Danielewicz (2004) explain what the principle roles of these groups towards urban assignments are; 'while it is the role of the government to create a conducive political and legal urban environment, the private sector creates wealth through generation of employment and revenue. The civic society, compromising of various interests groups facilitates political and social interaction and dialogue within the urban environment.' To reach good urban governance Habitat (2004) states that state, market and civic society should constructive and purposeful interact and engage based on effective participation of all stakeholders; the rule of law; transparency; responsiveness; consensus orientation; equity; efficiency and effectiveness; accountability; and a common strategic vision.

Urban  
Governance

***'The separation between policy and implementation allows politicians to concentrate on their core tasks.'***

Based on: Van Thiel, 2001

Another management concept focuses on improving efficiency; professionalizing management; bringing service closer to civilians; and downsizing the influence of politics can be found in the concept of new public management (Heurkens, 2012). This can be seen as a management concept emphasizing the importance of organization, while governance emphasizes the importance of management stating that governments should focus on 'formulating policy and clear objectives, whereas the implementation should be carried out by private and non-profit sectors' and 'has supervise implementation based on performance criteria' promoting 'autonomous organizations with a certain distance to politics' (Osborne & Gaebler, 1992; Hood, 1991; Pollit et al, 2004; Heurkens, 2012).

This facilitating role deployed by the state asks for hands-on professional management; explicit performance standards and indicators; emphasising controlling output, independent organizational units at distance, tendency towards more competition and tenders; asking for private management styles focusing on flexibility; and downsizing the use of means (Heurkens, 2012).

New public  
management

To what extent these management styles are applied in innovation district developments will be analysed in the following chapter.



## 5.2 INITIATING & ACTIVATING INNOVATION DISTRICTS

*'Many assume that innovation districts accelerate the process of innovation but that does not mean they always deliver on this objective.'*

(Morisson, 2015)

Several academics and practitioners state that innovation district require several prerequisites which in essence provide 1) sufficient critical mass of the economic, physical, and networking assets introduced in chapter 3 in combination with an environment which is 2) well-connected, diverse, and provides quality of place and presents 3) a unique identity but also entails 4) a vibrant environment able to stimulate innovation. When heaving 'the basics straight' spatially the question is what leadership roles and development strategies may grow the district to deliver on the objective of raising the innovation profile through for instance job creation, sustainable urban renewal or attracting and accommodating knowledge-intensive activities. Because, in order to develop and grow an innovation district, for instance 'landing platforms and spaces for collaboration need to be managed; entrepreneurs must be connected with venture capitalists; access to funding for start-ups is essential; strategic visions must be set; a masterplan designed; and the district must be programmed with events' (Morisson, 2014). A lack of coordination can result in inefficiencies and therefore asks for leadership and management.

Public-private  
alliances

Accordingly, as stressed in the introduction of the research, to initiate and finance these urban developments like innovation districts, local authorities have to join forces in public-private alliances which is getting private services privatized and the dependency on the private sector involvement in urban planning grow (Purcell, 2008; Daamen, 2010). In line with the emerge of these public-private alliances, academics stress the importance of an (independent) collaborative organization adaptive to change and up for innovation to develop innovation districts (Katz & Wagner, 2014; Morsson, 2015; Clark, 2016).

*To realise these untraditional urban projects negotiations and cities' leadership are necessary' and their organisations must be open allowing incremental economic growth and spontaneous market-forces to stimulate innovation.*

Based on: Morsson, 2015; Clark, 2016

However, at the city level some regional economic development policies still remain embedded in the paradigms of the 1970s, such as giving tax breaks and economic incentives to companies (Stimson, 2006). This collaborative development approach can be reached through triple helix partnerships which has emerged from the evolving role of universities; the nature of knowledge hubs like Silicon Valley (San Francisco) and Route 128 (Boston); and a new role of governments and institutions. It shows the collaboration between universities, industries and government in which all parties collaborate to foster innovation (Etzkowitz & Leydesdorff, 2000). Collectively, they design long-range visions and create new vehicles for innovation, such as research centres and incubators. In the case of 22@Barcelona, St. Louis, Kista Science City, and Eindhoven, the Triple Helix model established a clear organizational model of

collaboration from the start. For the 22@Barcelona project a municipal company was founded – 22 arroba BCN S.A. – to redevelop the former industrial district in Poblenou and embodied the long-term commitment of the city providing innovation district leadership. Further, Eindhoven and St. Louis are finding real success in a leadership model that includes a powerful development agency to execute strategies (Katz & Wagner, 2014). The involvement of the private sector and civic society in urban planning and development decisions, can be seen as a step towards collaborative planning (Healey, 2006) and has shaped planning systems and policies. To persuade the private sector to invest in and develop urban areas *shaping, regulating, stimulating* or *capacity building* tools can be used, enabling planners to steer market actions (Tiesdell & Allmendinger, 2005; Adams et.al, 2005; Heurkens, 2012). However these tools that facilitate market interests take no account of human competencies needed to deliver the intended effects.

Planning tools

planning tools	sub-type
<i>shaping</i>	development plans & investment plans
<i>the decision environment or context</i>	regulatory plans & development strategies
	indicative plans, visions & advice papers
<i>regulating</i>	state or third party regulation
<i>defining parameters for the decision environment</i>	contractual or bilateral regulation
<i>stimulating</i>	indirect/fiscal measures
<i>reconstructing contours of the decision environment</i>	direct state action
<i>capacity building</i>	actor-network relationships
<i>developing actor's ability to identify and/or develop more effective and desirable strategies</i>	social capital
	cultural perspectives

Table 5.1. Planning tool types. Sources: Adams, et. al, 2005; Heurkens, 2012

In the case of the 22@Barcelona project, Cortex St. Louis, and Cambridge the development of masterplans was used to shape the decision environment of the innovation district development and the the complexity in physically redeveloping their districts. MIT experts, on the other hand, used strategic visions which are more agile than traditional masterplans. Boston, instead, developed design guidelines and development standards to guide changes incrementally as new developments come online (Katz & Wagner, 2014). In the Boston Innovation District project a strategic and operational infrastructural plan was developed in 2014 - Sustainable Transportation Plan – to analyse and monitor trends and create an efficient transportation system including plans for public bicycle sharing, the implementation of car services like Zipcar, but also improving bus routes and subway line potential.

Development plans

The MPGM22@, on the other hand defined six areas, planned to be developed by public initiative assuming that the surrounding not-indicated areas may be developed by private or public initiatives later on. Besides, the MPGM22@ did not determine a detailed and precise plan of each part of the area but refers to the derived planning to channel and specify the planning of each sphere of transformation (22ARROBABCNSAU, 2011). In the case of the Barcelona Innovation District the development strategy was built on two policy documents; *'Digital City'* and *'Barcelona, City of Knowledge'* providing a roadmap towards a digital and knowledge-intensive city.



These documents formed the base of three operational plans namely a zoning plan (Modification of the General Metropolitan Plan); an infrastructural plan (Special Infrastructure Plans); and a heritage plan (Modification of the Special Plan for Historical/Artistic Architectural Heritage in the city of Barcelona). By not defining a precise masterplan the 22@ planning framework becomes complex but also flexible, resilient and more adaptive to a changing market demand.

*‘Unlike traditional urban planning, the 22@district is not preplanned and can organically grow.’*

(Barcelo, 2005)

Figure 5.4. 22@Barcelona masterplan (Ajuntament de Barcelona, 2012)

The zoning of the Poblenou district had to be adapted to allow knowledge-intensive (productive) activities. The district’s zoning changed from ‘22a’ to ‘22@’ meaning a shift from strictly industrial zoning to a mixed-use zoning (UPD, 2000). As all land within the 22@ district was privately owned when initiating the 22@ pilot the MPGM22@ provided strong incentives for both real estate developers as private owners to stimulate real estate developments. Urban policies increased building rights per square metre when plans entailed knowledge intensive activities. In addition, regulatory structures on mixed-use and preservation of heritage, flexible building regulations, social housing strategies and land use incentives, are used to activate the innovation district. Aiming to stimulate cross-overs among the different actors located in the innovation district. Besides land use incentives the 22@ district has created a free-trade zone for mobile technology companies as well as incentives packages including tax breaks, rent subsidies, and flexible rental periods to attract innovative companies active in ICT and media showcased and promoted in its yearly Mobile World Congress (Morisson, 2015). In addition, the special infrastructure plans promote the district as a showcase of urban best practices in sustainability; has gained over nine million dollars on European funding and realised over 50% of its ambitions by the end of 2011. The plans were funded by landowners within the district for 60%, 10% by the city council, and 30% by public service operations (Olivia, 2003).

*‘Planning tools can influence the way projects can be developed by indicating spatial visions and directions for development, by stating financial, programmatic or lay-out rules for development, or by securing funding and investment for development.’*

(Heurkens, 2012)

#### Resources

To carry out these type planning tools in urban area development projects some essential resources are needed (Burie, 1978). These resources – land, capital, knowledge, can increase the power of an actor possessing it and therefore can be seen as management measures as well (Heurkens, 2012). These resources represent (traditional) material and knowledge power relations between actors besides the essential resources *expertise, legitimacy, commitment, instruments, and time/result effectiveness* (Daamen, 2010). An actor possessing most of the land, bringing in capital, or having the required knowledge to bring into the urban development project, can influence decisions about the project to realize his own objectives. In practice such resources are seen as the most powerful way of steering development projects (Heurkens, 2012).

*'Boston has relied on a persuasion exercise with real estate developers to build its innovation district.'*

(Morisson, 2015)

Like with the 22@Barcelona project the majority of the land is privately owned in the Boston Innovation District area. Therefore the BRA (Boston Redevelopment Authority) had to come up with an urban planning framework which guarantees the incorporation of innovative amenities. The BRA can keep a tight rein on suitable tenants fitting the ambitions of the Boston Innovation District due to the lease constructions established. In the case of the Seaport Square project, comprising an almost 10 hectares large masterplan project, the real estate developers engaged in the project have to lease at least 1100 square meter to a tenant matching the Innovation District initiative for at least 15 years. In addition the real estate developers had to consult with the BRA for over a year to incorporate innovative amenities and addressing elements related to, for instance, the public realm, programme, sustainability and infrastructure (BRA, 2010).

Public authorities can use the previous described planning tools to influence innovation district developments; show commitment; accelerate the development of the district to spur innovation and entrepreneurial growth; and boost human capital. Accordingly they can deploy resources as land and capital to finance land, infrastructure improvements, and other collective benefits. However, to fund specific needs in innovation district development public authorities need to join forces in public-private alliances and should therefore provide reliable, predictable, and more flexible resources.

Public  
authorities

In the case of the Boston Innovation District the Boston Redevelopment Authority defined these innovative amenities as laboratories, incubators, public event spaces, shared spaces, rooftop gardens but also hotel, business, and housing facilities. Accordingly the BRA was responsible for the urban planning as economic development agency of the City and took the role of aligning the objectives and vision of the City with the real estate developers' targets. According the Chief of Staff at the mayor's office at the time, they had a hard time persuading real estate developers to develop untraditional projects in favour of stimulating shared innovation. In the context of the innovation district development, real estate developers are, for instance, obliged to develop 15% of affordable and workforce dwellings based in favour of diversity and to limit the negative effects of gentrification.

Responding to changing physical, legal, economic and social fields while creating and imposing expectations but still fulfilling obligations, charges, and duties is the specific task of urban planning which the MPGM22@ tries to realise through urban management (22ARROBABCNSAU, 2011). This becomes apparent in the 22@Barcelona model which is based on the triple-helix model of innovation. Because, each cluster is represented by a university, a leading private company, and several entities from the Barcelona City Hall (Morisson, 2015). For example the media cluster created a Barcelona Media Park due to the collaboration between the Universidad Pompeu Fabra, Mediapro, and the department of Culture, 22@Barcelona, the local development agency and the Centre for Corporate Innovation and Development (Barcelo, 2005).

In addition to these lessons on the Barcelona 22@ and Boston Seaport case Clark (2016) obtained a research on building the innovation economy in which roles to be taken by the public as well as the private sector are identified. A division is made into an initiative phase, an activation phase, and a maturing phase. Each demanding different roles and accordingly different strategies, decisions and interventions.

When linking these roles defined by Clark (2016) to the planning tools local public authorities could deploy defined by Adams, et. al (2005) and Heurkens, (2012), the following planning approaches can be conceptualized (table 5.4).

<b>Roles of local public authorities in innovation district development</b>	
Envisioning	<i>Leadership vision &amp; Long-term city strategy</i>
	<i>Site selection</i>
Shaping	<i>Development propositions, plans, strategies</i>
Regulating	<i>Regulatory plans</i>
	<i>Building rights &amp; Contracts</i>
	<i>Co-ordination of public land uses</i>
Facilitating	<i>Citizen outreach, communication, knowledge sharing</i>
Entrepreneurial	<i>Site reparation</i>
	<i>Public infrastructure investment</i>
	<i>Partnering in innovation-rich developments</i>
Stimulating	<i>Providing incentives</i>
	<i>Speed-up planning, permits, etc.</i>

Table 5.2. Roles of local public authorities in innovation district development.

Leading to the understanding that in the context of innovation district developments, local public authorities have a critical role to play in which *vision and strategy* are key to initiate an innovation district development. To prevent these initiatives from becoming just a rebranding effort, these developments can be activated with specific investments and interventions depending on the growth avenues foreseen; anticipated development dynamics and market demand. Governments and local public authorities must therefore become *enablers and facilitators* and undertake *a planning role* in terms of formulating strategies, plans and supportive policies; however investments in public infrastructure and relocation incentives require a more stimulating and *entrepreneurial role* complemented by a *visionary role* towards new developments, place-making and mixed-use initiatives (Clark, Moonen, & Peek, 2016).

## 5.3 PLANNING APPROACHES IN URBAN PRACTICE

*When economic aspirations on raising the innovation profile of a distinct urban area meet an urban redevelopment project, mainly in the case of innovation districts based on the re-imaged urban model, different organisational models become apparent.*

When comparing lessons from the planning examples explored previously; underpinned by the findings of the ULI institute and the Netherlands Environmental Assessment Agency (PBL); and built on the theoretical foundation provided by Etzkowitz (2003) the assumption can be made that the independent organisation entrusted to initiate and develop the innovation district can be found in the form of three main partnership types.

First, double helices partnerships, with university-industry collaborations represent a more laissez-faire approach<sup>10</sup> like in the case of the Boston Innovation District. The City of Boston and the BRA, take a more laissez-faire approach towards the development of the Boston Innovation District relying on the more traditions assumption that industry-university collaborations foster innovation. Overall the development of the Boston innovation district is mainly driven by negotiations with real estate developers in which local public authorities do not take an entrepreneurial role but stick to their regulatory role in 'setting the rules for the game' (Etzkowitz, 2003). This development is therefore low on government interventions and the financial burden is carried by private actors. However the City of Boston and the BRA actively try to attract investors, developers but also creative entrepreneurs by taking a more facilitating role in incentivising real estate developments, funding social (art) projects; programming the District Hall; and trying to connect the Boston's young adult population with resources related to housing, professional development, financial health, and civic engagement through an online platform.

Laissez-faire approach

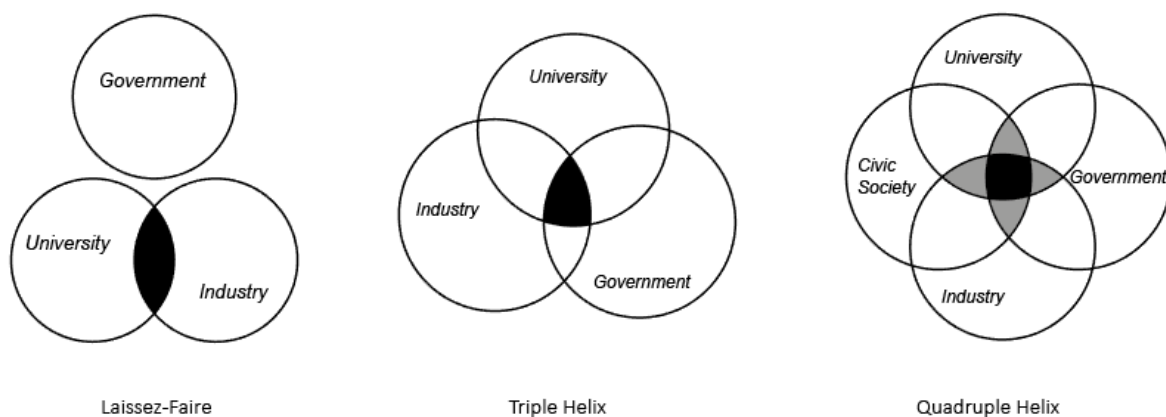


Figure 5.5. Partnerships in innovation district development. (Etzkowitz, 2008)

A more collaborative approach becomes apparent in triple helix and quadruple helix partnerships, showing joint ventures between public (politic), private (economic), academic (knowledge) entities which in some cases actively include civic society. This becomes apparent in the organization of the 22@Barcelona project. Accordingly, due to a top-down governance strategy on the bases of potential economic growth and to ensure that the proposed and approved plans meet the aims set in the 22@ Plan the MPGM22@ takes a facilitating role in guiding and assisting private initiatives and the creative teams during the drafting of their development plans. In addition the city of Barcelona, through the MPGM22@ entity, takes a governing role in pursuing the relevant urban planning agreements and takes an entrepreneurial role when processing and deploying management instruments and when directly fostering the strategic spheres where public-private collaboration is essential to enable the transformation.

Collaborative approach

As private sector investments are needed and public sector involvement in innovation district developments are inevitable, public and private actors become interdependent in realizing their respective development interests and objectives within spatial projects. These actors, both public and private, can deploy different planning instruments, engage in distinct activities, and take multiple roles to influence the innovation district development. Heurkens (2012) stresses that the way these management measures are used and by whom, determines the outcomes of the project.

<sup>10</sup> **laissez-faire approach:** laissez-faire is an economic theory that became popular in the 18th century. The driving idea behind laissez-faire as a theory was that the less the government is involved in free market capitalism, the better off business will be, and then by extension society as a whole (investopedia).

Accordingly Wicherson (2011) provides an understanding on the roles and strategies posed by local public authorities in relation to the allocation of means. Resulting in four different types of governing roles depending on the availability of management resources (figure 5.9).

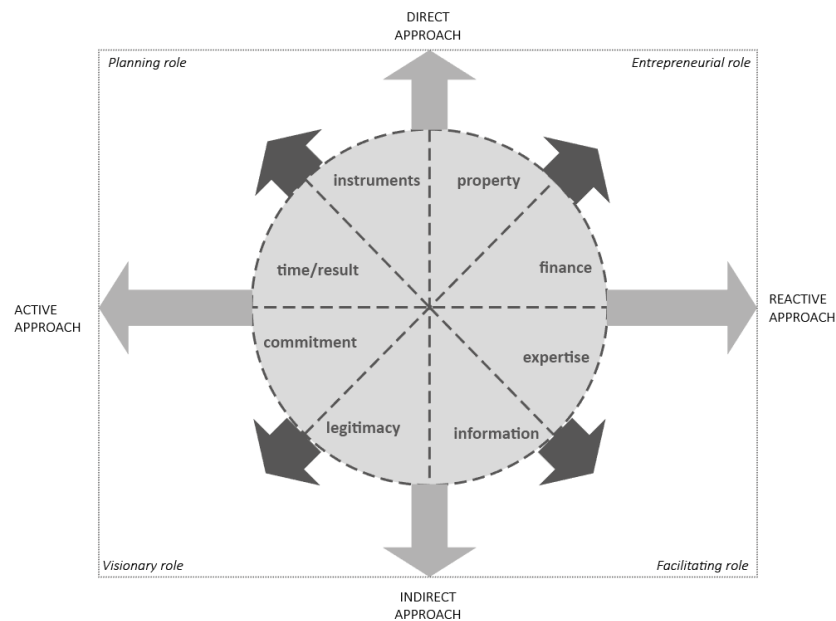


Figure 5.6. Conceptual model: governing roles based on decisive management resources. Based on Wicherson (2011)

Within these different development approaches relations with other actors and local public authorities change. A *planning role* emphasizes the planning relations comprising contracts, plans, the importance of momentum and procedures while an *entrepreneurial role* focuses on material relations in which capital in terms of land, real estate and funding can be deployed. A *visionary role* on the other hand stresses the effort for public support in urban area development projects through commitment based on trust, participation, persuasion and responsibilities. In addition, a *facilitating role* refers mainly to knowledge relations in which information and expertise is shared and mobilized in order to support other actors involved in urban area development projects.

Linking these findings on the roles, planning tools, and management resources results in the formation of a conceptual model on effective governing roles in innovation district development. This model will be used to analyse the case analysis and will be presented in the conclusions on innovation district development following next.

## 5.4 CONCLUSION: EFFECTIVE PLANNING IN INNOVATION DISTRICT DEVELOPMENT

Linking spatial policies more close to project implementation in innovation district developments through joint public-private efforts results in either horizontal relations, in terms of urban governance, or in hierarchical client-contractor relations from the perspective of new public management. Both management perspectives address the same resources, tools, and activities but provide a different focus ranging from organisation to management. Accordingly local public authorities can use different planning tools in relation to their management resources as land, capital, and knowledge, to influence innovation district developments.

It is important to understand how urban development projects are organized and which roles can be taken by different actors involved. However, despite the focus of triple and quadruple helix interactions in theory, these partnerships become less tangible regarding the development of the physical dimension in innovation district developments. Because, existing knowledge on the relationships and interactions within these organisational spheres to organize collective actions and manage resources to stimulate innovation at the area level is limited (Curvelo Magdaniel, 2016). Subsequently, Clark et al.'s (2016) findings on the roles and stages of innovation district development address mainly traditional actors in urban development like public authorities, investors, and developers. These roles are linked to the planning tools defined by Heurkens (2012) and accordingly to the planning approaches defined by Wicherson (2011) resulting in a conceptual model to be used to analyse the governing roles deployed and desired in the Rotterdam Innovation District (figure 5.10).

Role-taking  
local public  
authorities

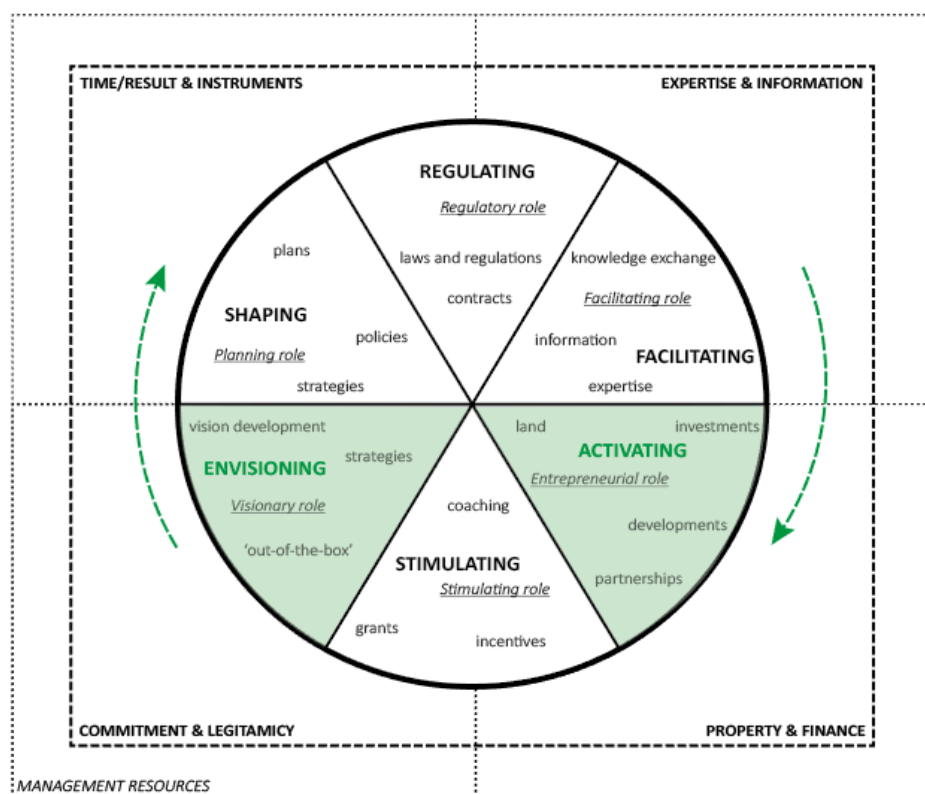


Figure 5.7. Conceptual model on effective planning in innovation district development.

From this theoretical exploration can be learned that because vision and strategy are important to initiate the project and create public support a planning and visionary role is needed. In addition, specific investments and interventions are essential to activate the district in which public authorities must become enablers and facilitators to realise new developments asking for an entrepreneurial and stimulating role. Complemented by the more traditional roles deployed by local public authorities in shaping, regulating and facilitating the decision environment for urban development projects.





# CHAPTER 6

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## CASE STUDY FRAMEWORK

This research intends to provide an understanding on effective planning approaches to be deployed by local public authorities in innovation district developments. While stimulating innovation through the built environment at the urban district level. To do so the previous three chapters provided a theoretical basis. Insight was gained into innovation district planning and knowledge was built on the ways innovation can be facilitated, influenced, and catalysed through the built environment.

To test and evaluate these findings an analysis framework for the case to be examined is constructed. Building this framework is done by answering the following question: *How can we study the roles (to be) deployed by local public authorities in developing the Rotterdam Innovation District effectively and simultaneously provide an understanding on what spatial conditions and physical interventions are desired to stimulate innovation at the urban district level?*

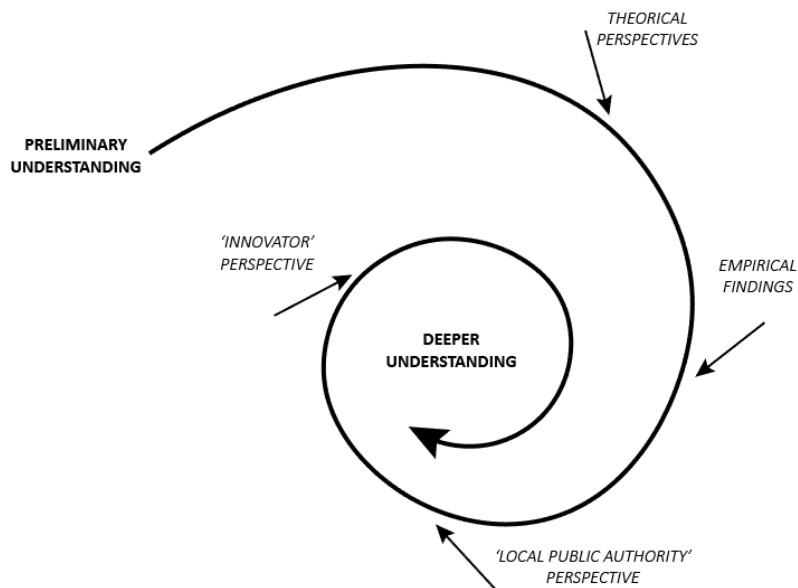


Figure 6.1. Case analysis methodology.

First, defining effective planning approaches to be deployed by local public authorities ask for insights into the development dynamics, local planning processes and the roles deployed and desired by the local public authority involved in the development of the innovation district project. Therefore semi-structured interviews were conducted with the involved members of the project team M4H within the CityPorts organisation representing a local public authority in the development of the Rotterdam Innovation District.

Secondly, as this research aims to gain insight into how innovation districts can become more than just branding initiatives neglected by the actual innovators, empirical data is collected from the perspective of the actual innovators accommodated in the Rotterdam Innovation District and promoted as important to the Rotterdam innovation ecosystem. An understanding on innovation district development from the ‘innovator perspective’ help to bridge the gap between the project outcome preferred by the actual innovators and the ambitions set in innovation districts propositions.

Appendix B provides an overview of the interview protocols used to structure these interviews.

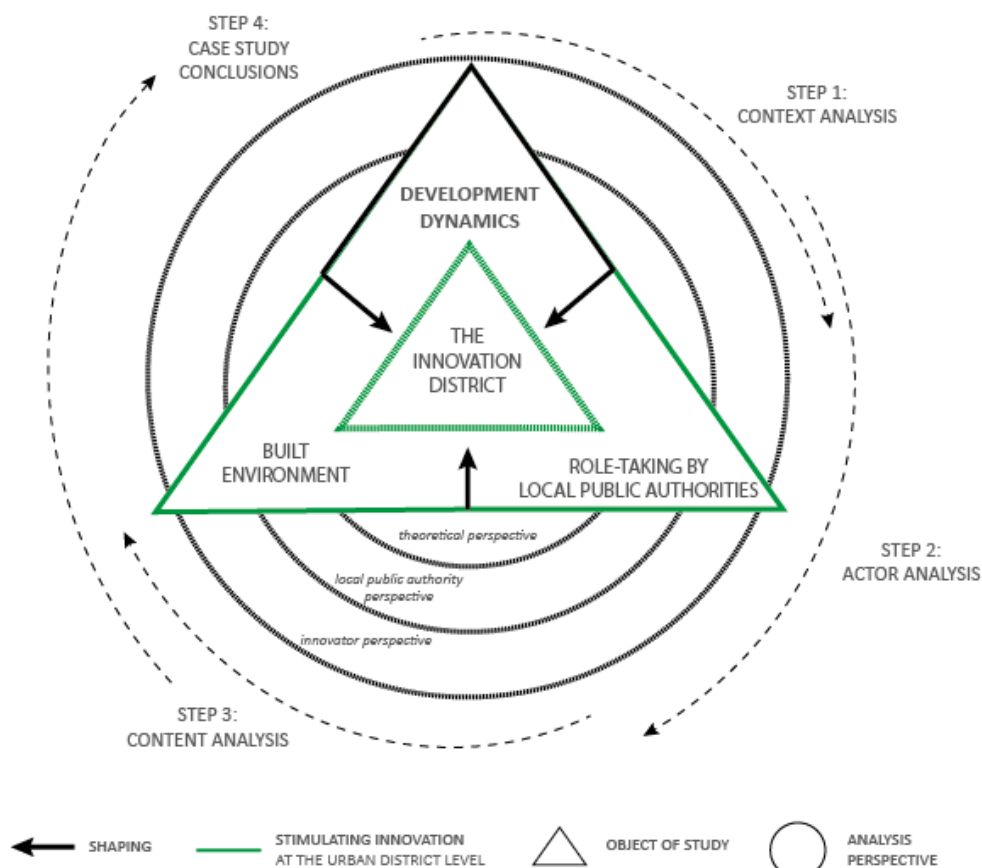


Figure 6.2. Case analysis framework

Subsequently, the findings from the theoretical exploration of this research are tested by exploring to what extent the built environment stimulates innovation in the case of the Rotterdam Innovation District through a content analysis and which planning approaches are deployed by the local public authority in the development of the innovation district project by means of an actor analysis. Conducted by means of a document analysis in combination with semi-structured interviews. But first theory is built through a context analysis on the development dynamics providing an understanding on the socio-economic and institutional characteristics of the place, the planning processes and related resources as land, capital, legal power and political legitimacy, and the present public-private partnerships and thereto related power relations.



# **PART 3**

## **CASE ANALYSIS**

# CHAPTER 7

## *Exploring the Rotterdam Innovation District*

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### 7.1 INTRODUCTION: THE ROTTERDAM CITYPORTS PROJECT

The case to be examined more in-depth in this chapter concerns the Rotterdam Innovation District. The Rotterdam Innovation District comprises the Merwehaven, the Vierhavens, and RDM, situated within the scope of the Rotterdam CityPorts project and counting for 1,600 hectares of land and water (figure 7.1). The object of study is narrowed down by concentrating on the Merwe-Vierhavens as the RDM-terrain has already turned into a more maintenance face; is owned and programmed completely by the Rotterdam Port Authority N.V.; and concerns a mainly real estate refurbishment. The Merwe-Vierhavens, on the other hand, reflects a more contemporary urban development project at the urban district level.

Scope



Figure 7.1. The Rotterdam CityPorts project. (Stadshavens, 2015)

The Merwehaven and the Vierhavens, hereinafter referred to as the Merwe-Vierhavens or in short M4H, is the only older port area of Rotterdam situated at the north side of the Meuse. This area is allocated as strategic location to explore the opportunities of the next economy<sup>11</sup> and forms one of the last expendabilities for the city at the north bank of the Meuse.

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<sup>11</sup> **Roadmap Next Economy:** to improve accessibility and strengthen the economic business climate of the metropolitan region of The Hague, Rotterdam, Delft, Leiden, and Dordrecht, the region partnered with knowledge institutions and companies and collaborated with Jeremy Rifkin. This American economic and social theorist helped to construct a roadmap focussing on 1) Smart Digital Delta, 2) Smart Energy Delta, 3) Circular Economy, 4) Entrepreneurial Region, and 5) Next Society for which the Rotterdam Innovation District will form a physical testing ground and living lab.

The CityPorts project comprises the city-port areas of Rotterdam assigned to be managed by Stadshavens Rotterdam – the alliance between the Rotterdam Port authority N.V. and the municipality of Rotterdam. These city-ports areas can be seen as (former) port areas, generally characterized as wet areas including large-scale industrial structures and are filled with port activities and logistics.

The CityPorts project was originally initiated as part of a framework of projects to bring the Maasvlakte 2 expansion plan closer to realization. Over time, Stadshavens Rotterdam formulated its own goals and strategic, long term objectives with the idea that in time all land within the CityPorts project will be transferred back to the city. The development objectives altered towards the ambition of realizing a mixed-use urbanized area against the background of shifting and transforming port activities to create societal and economic gains for the municipality of Rotterdam (Daamen, 2010). This transition zone, where port and city meet, is however still mostly dominated by port-related activities but also still high on the political agenda when it comes to redevelopment.

Object of  
study

The Rotterdam Innovation District can be seen as an urban development project within the CityPorts project in which Stadshavens Rotterdam embodies the local public authority involved in initiating and realising this project. Stadshavens Rotterdam is seen as the initiator of the project and forms the central object of study in this case analysis.

In this chapter, the Rotterdam Innovation District will be explored following the case study framework presented in chapter 6. Accordingly, this chapter explores to what extent the built environment stimulates innovation at the urban district level. Besides, the roles that are deployed by Stadshavens in planning for and developing the Rotterdam Innovation District are examined. Subsequently, the innovation district development strategy is analysed. Through a reflection on this strategy and by comparing it with the expectations derived from theory, distinctive similarities and differences are formulated. In addition the innovator perspective on the desired spatial conditions and planning approach to be taken by Stadshavens is explored. In this way knowledge is built on what could be improved by Stadshavens to make sure the innovation district development will not get neglected by the actual innovators already present in the area. But first, an exploration on the context in which the development of this redevelopment project, labelled as ‘innovation district’ is taking place will be given to determine which development dynamics led to the innovation district initiative.

## 7.2 STEP 1: CONTEXT ANALYSIS

### *Spatial, institutional, and social-economic development dynamics*

#### 7.2.1 Understanding the urban development background

Rotterdam is characterized by its north-south division due to the course of the New Meuse. The relation with the river made Rotterdam a renowned city for trade and important gateway to Europe. Naturally, Rotterdam did not have such a favourable position for becoming a successful port-city. The connections with the hinterlands and the Rhur area were often praised. Nevertheless, the entrance of the port was dramatic. Rivers were sanding, changing of shape and sailing ships had a hard time passing through. It could take days to reach the wharfs. With the development of de Nieuwe Waterweg, engineered by Pieter Calland in 1972, a bigger port transit was realised.

History

Due to the first industrial revolution, the steamship brought along new industries. Leading to a scale-up of port activities towards the south (figure 7.2). This was the beginning of the separation of port and city as the port activities started to expand towards the West. Serious investments were made in the railway network which made Rotterdam in favour for industries exporting coal and ore. After reconstructions due to the bombings in 1940 port and city continued growing reaching a population of 732.000 providing 116.000 jobs in port and industry by 1965 (Peek, October 2016). In addition, with the rise of the oil industry, Rotterdam became one of the largest seaports worldwide.

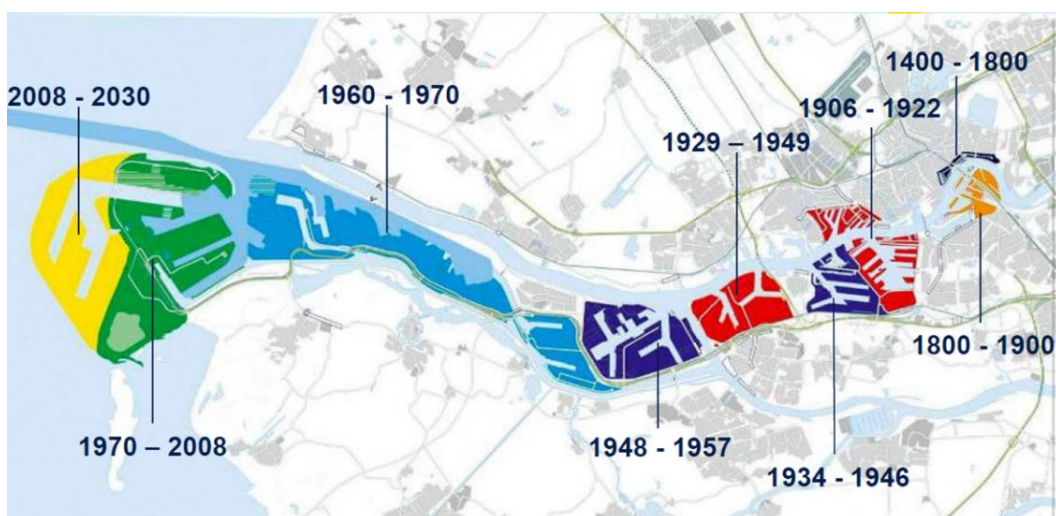


Figure 7.2. Port of Rotterdam development. (Port of Rotterdam)

In the nineties inner-city ports and port-related activities started to spread around the region. Therefore the spatial dimension of ports were losing its significance and port activities started to migrate out of the city centre towards deeper waters in order to become technologically more advanced (Daamen, 2010). This also became apparent in Rotterdam. Due to 'industry politics' and government involvement in the ongoing industrialisation along the Meuse huge areas known as the Botlek, Europoort, and the Maasvlakte were being developed (coloured in blue, green and yellow in figure 7.2). Accordingly industries moved further downstream the river leaving unproductive waterfronts behind.



Parallel to these shifting port activities towards the West the municipality was discovering the competitive advantage of having distinct and attractive places close to its urban core. The success of other urban waterfront projects presented considerable incentives for city administrations but also for private developers to propose a new future for the inner-city port areas even though some were still being (partly) occupied by port and port-related activities (Daamen, 2010).

*The municipality saw an opportunity to redevelop the inner-city ports into distinct and attractive places close to the city centre.*

This resulted in a growing attention for the revitalisation of the CityPorts area to enhance economic renewal and led to the initiation of the CityPorts urban development project (Daamen, 2010). The municipality saw an opportunity to redevelop the inner-city ports into distinct and attractive places close to the city centre. Because, the New Meuse does not only shape the lay-out of the port but also separates downtown Rotterdam comprising mainly working-class neighbourhoods from the more business and knowledge-intensive central part of Rotterdam. Accordingly, the first projects were most closely located to the inner-city around the Oudehaven, Zalmhaven, and Leuvehaven. These projects were followed by the developments of the Kop van Zuid and Katendrecht. Marking the border of the CityPorts nowadays comprising the Rijnhaven, Maashaven, Waalhaven, Eemhaven, RDM, Merwe-haven, and Vierhaven (figure 7.1).

*To organize the (re)development of the inner-city ports, the municipality of Rotterdam and the Rotterdam port authority decided to jointly develop these areas.*

Institutional  
context

Since then the CityPorts project has become the focus of a new urban development project for the next ten to twenty-five years, formally initiated in November 2002. In addition, by January 2004 the municipal port authority became more separated from local politics and transformed into the Port of Rotterdam PLC due to an official corporatization. In this way port land would still be owned by the municipality, but controlled by the new port entity through economic ownership (Daamen, 2010). At the same time, the first project organisation by means of the Rotterdam CityPorts Development Company (OMSR) was founded which became responsible for managing the CityPorts project.

Due to this lease contract port land properties could be transferred to the city to finance the redevelopment assignment of the OMSR. In addition, the OMSR could stimulate connections between the new port authority and the existing municipal urban development department OBR. It was expected that a more collaborative attitude between these organizations would produce clearer communication to the public and a firmer grip on the economic development of the city of Rotterdam (Daamen, 2010). Expertise was gathered from both organizations and assigned to the OMSR. It was believed that the OMSR employees would bring in the necessary expertise to bridge the gap between the two 'regimes'; could reach a mutually beneficial CityPorts development 'vision'; and in this way were able to strengthen the port-city partnership.

*In 2003 and 2004, the CityPorts project was mainly about analysing the project scope, refining it, and investigating the attractiveness of the area in terms of locational advantages and suitable economic sectors for new developments.*

The responsibilities and jurisdictions of the project organisation towards the CityPorts area were limited; accessibility and environmental issues in the area turned out more complex; port activities in the area could not be relocated as fast as was expected; and more public planning activities were considered undesirable by the port authority. As a result, the OMSR tried to respond more effectively to new opportunities for development in a managing and facilitating way instead of conducting pro-active urban interventions.

Along the way conflicts of interest occurred in relation to the ambitions for the CityPorts areas. Due to the delay of the realization of the Maasvlakte 2 and state interference in the port authority entity, the commitment of the port authority to the CityPorts operation came under serious pressure (Daamen, 2010). The shareholders demanded clear prospects in terms of a translation of the project into business-cases to gain national support.

***The (re)development projects of RDM and the Merwe-Vierhavens are significantly further from the city centre and gained renewed interest by the port authority to operate in favour of staying ahead of the competition and anticipating on the next economy.***

Because, in 2006 the Ministry of Economic Affairs defined the CityPorts area as an economic priority in need of restructuring (MinEZ, 2006). Accordingly, with 'Pieken in de Delta', as the forerunner of the current 'Topsectorenbeleid', a subsidy program initiated by the Ministry of Economic Affairs, the aim was made to enforce the Dutch business climate.

Even though the OMSR had its own separate organization, the project was highly influenced by political debate and the ongoing negotiations between municipality and port authority. By 2007, the OMSR was dismantled and the CityPorts project entered a new phase in which the Rotterdam CityPorts Project Bureau (PbSR) Director was mandated as the official representative of the CityPorts project during State-level meetings and discussions. Besides, within the PbSR several teams, integrated in the traditional municipal and port authority organizations, would become responsible for the designated subareas.

Project  
organisation

***Due to the fact that the CityPorts project became embedded in provincial and state level programs, new plans, strategies and programs of implementation were formulated.***

According the City Vision and its Implementation Program 2007-2015, that gave a slight sight of the desired results for 2025 and 2040, new alliances with knowledge institutes and room for the development of innovative technologies and urban-oriented economic activities, such as maritime services, creativity, and IT were needed to stimulate economic growth. Two main goals were set namely 1) enhancing the economic structure of city and port and 2) creating attractive high-end working and living environments. For the Merwe-Vierhavens this meant providing residential and work facilities associated with the Rotterdam Climate Campus and creative industry. While the development of the RDM-terrain – Research, Design, and Manufacturing, focussed on mixed work with education, appointing the RDM Innovation Dock as the accelerator of the development of the RDM Campus.

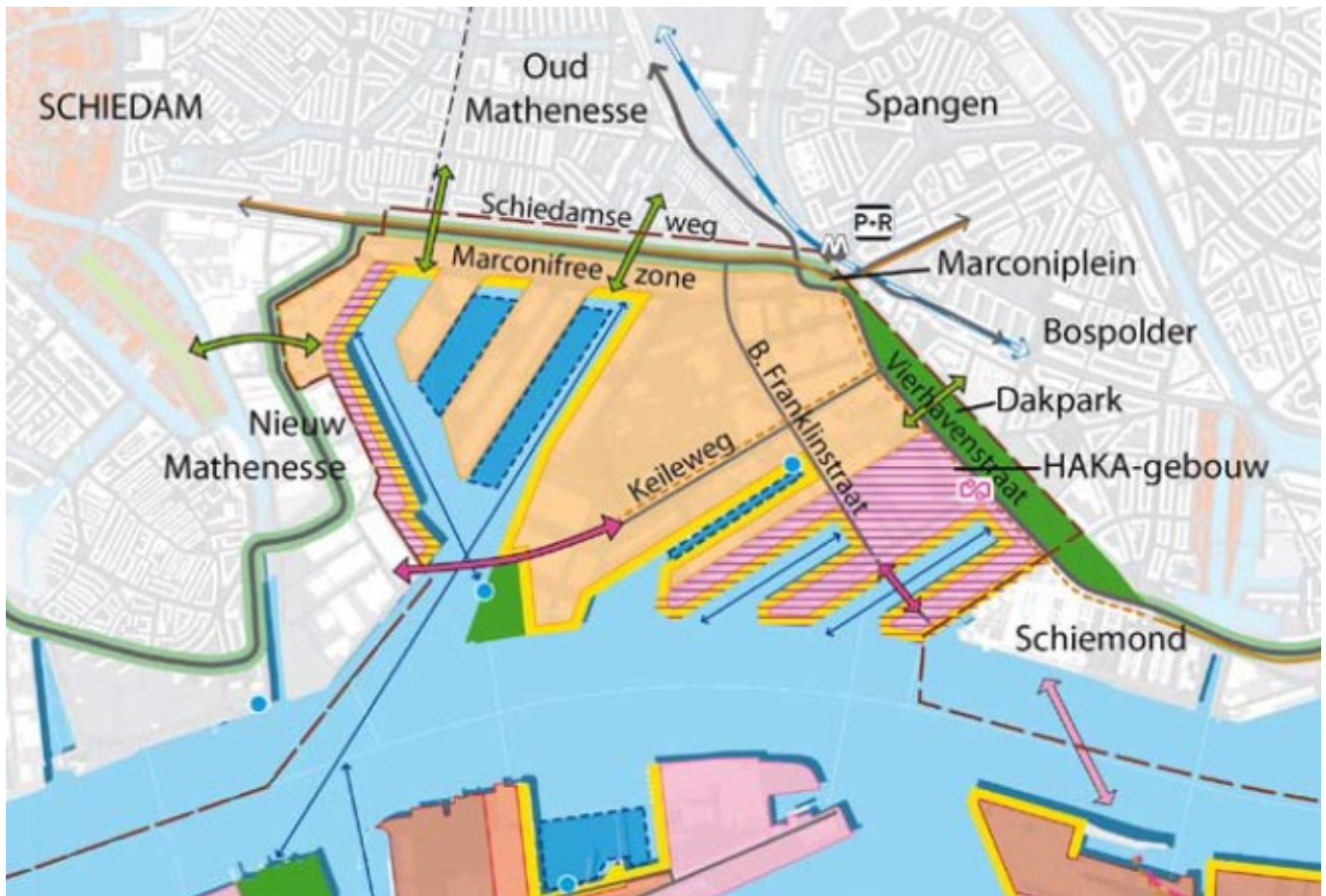


Figure 7.3. Spatial development strategy 2015 Merwe-Vierhavens  
(Programmbureau Stadshavens Rotterdam, 2011)

The Implementation Program 2007-2015 was meant to clearly define the availability of space and allocation of resources. For the Merwe-Vierhavens four specific projects were defined namely Darkpark, comprising the refurbishment of the Vierhavenstraat and transforming it into a park lane including 8 hectare of public space in combination with commercial spaces; Keilehaven refurbishment into an attractive route; Marconi free zone, making room for creative pioneers; and the Climate campus (figure 7.3).

*‘The area should be a place for testing grounds for new industries.’*

(Stadshavens Rotterdam, 2008)

Accordingly, the PbSR provided strategic guidance for redeveloping the CityPorts which plans became incorporated in the ‘Structuurvisie Stadshavens 2011’, bringing the planning process to completion. By 2011 this spatial development strategy was adopted by the city council and used in the new Dutch Spatial Planning Act as a planning tool to describe the spatial developments intended for the coming years providing a framework for future zoning plans. For the Merwe-Vierhavens this document states that this area has to be redeveloped as a new city district providing 4,500 to 6,500 dwellings in combination with companies, supportive facilities, and testing ground for innovative energy supply and water management. Industrial heritage as HAKA-pand and Katoenveem are promoted in line with the possibilities provided at the Marconi free zone. To redevelop the Merwe-Vierhavens several prerequisites and interventions were suggested and placed in time. Emphasising extra public transportation possibilities, slow traffic connections while upgrading high-profile locations as Vierhavenstraat and Marconiplein (figure 7.3).

Planning  
tool

In response, a more in-depth vision for the redevelopment of the Merwe-Vierhavens was presented in the area plan 'Pionieren aan de Maas' in 2009, emphasising the fact that redeveloping the Merwe-Vierhavens from an unsafe 'no-go' area to a lively attractive living environment takes time and is costly due to the challenges posed by environmental contours, its connectivity to the city and its reputation as industrial site. However, the image of the area is already changing due to the entry of creative pioneers refurbishing former warehouses into offices and ateliers. In addition, a flexible development approach able to react on market initiatives and in favour of fostering these 'early adopters' was praised (THEORY BOX: 'Early adaptors'). This approach focussed on facilitating and locating specific activities that mainly excluded companies with high environmental categories that could hinder the development of a pleasant living environment.

### THEORY BOX: 'early adaptors'

#### STRATEGIC DRIVERS IN URBAN AREA DEVELOPMENT

The promotion of the established early adapters, accommodated in refurbished warehouses and breaking with the maritime identity of the Merwe-Vierhavens can be seen as incubators changing the identity of an area .

As a reaction on the settlement of creative pioneers, in the case of the Merwe-Vierhavens by artists as Joep van Lieshout, the early adapters became an important catalysts in the transition towards the envisioned redevelopment ambitions attracting the early majority that matches the target groups targeted in redevelopment propositions and area plans (Claassen, Daamen, & Zaadnoordijk, 2012).

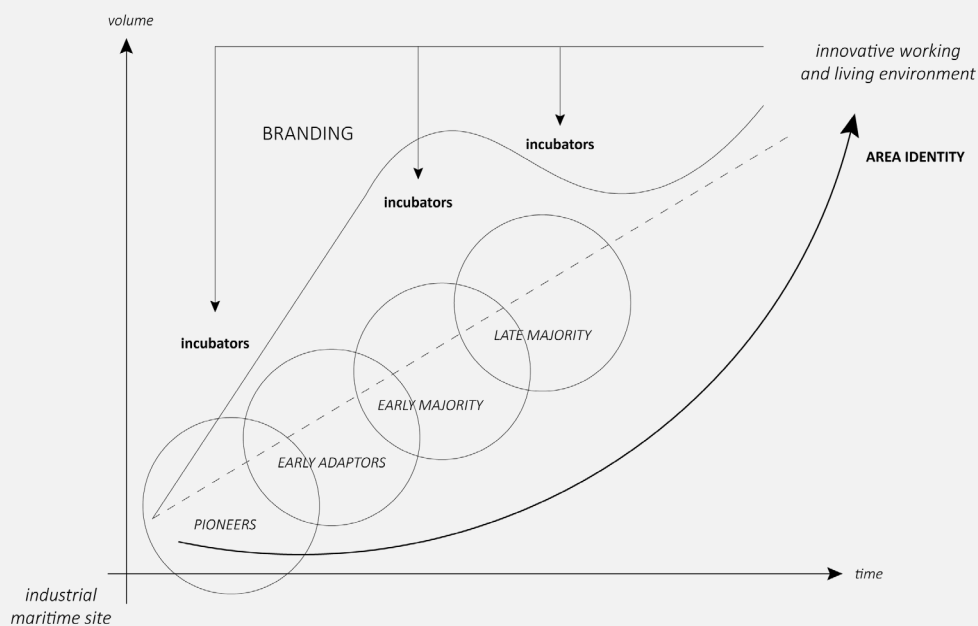


Figure 7.4 Transformation through incubators. Adaptation on: Hoogendoorn & Peeters, 2005

The theory behind this evolving concentration of innovators is built on the beliefs that certain 'enablers' and 'incubators' can influence the transformation process of urban areas and are able to attract people with their activities (Hoogendoorn, 2005; Wellink, 2008). When these first pioneers are followed by the early adapters an increased attention and recognition for the urban redevelopment project is to be expected. Which may result in new developments to attract the early majority.

Due to the financial crisis in 2008 the municipality of Rotterdam was no longer in a position to initiate these large-scale redevelopment projects as presented in earlier planning documents, and became in need for different redevelopment strategies. Parallel to this, with the ambitions set high on urban developments the port authority took a more cautious attitude due to the risks and uncertainties posed by aiming for a large scale urban redevelopment in times of changing development dynamics. This affected the relationship between the City and Port in Rotterdam. Accordingly, instead of a traditional ‘port-out, city-in’ model, the municipality and port authority joined forces to apply a ‘city-port’ approach (Peek, October 2016).

***The partnership agreement between the municipality of Rotterdam and the Rotterdam Port authority N.V. changed into the ‘Programmabureau Stadshavens’ by 2013.***

With this renewed collaboration agreement, a number of new principles and arrangements between the municipality and port authority were set in which the Stadshavens Programme Office became responsible for supporting the municipal division of SO/REO<sup>12</sup> and port division of Port Development as these departments were entitled for the actual implementation and operationalization of activities (table 7.1).

<b>Formal role-taking Rotterdam Port authority N.V</b>	Acts as investor/developer when projects meet the port vision and strategy
<b>Formal role-taking municipality of Rotterdam</b>	Acts as a manager in a regulatory role in the developments of M4H Well-integrating and embedding urban area development projects in both entities – port and city + acquisition of new companies and activities.
<b>Formal Role-taking Stadshavens</b>	<p><i>Responsible for overarching activities as:</i></p> <ul style="list-style-type: none"> <li>• Safeguarding Structural Concept of 2011</li> <li>• Safeguarding collaboration agreement</li> <li>• Marketing and promotion</li> <li>• Funding creation and application</li> </ul>

*Table 7.1. Formal role-taking partnership agreement. Based on (SOK addendum, 2013).*

Partnership  
agreement

Meanwhile the redevelopment of the Merwe-Vierhavens was very low on activity for a long time. Therefore, in 2012 in line with the new collaboration agreement between the Rotterdam Port authority N.V. and the municipality a project team was established committed solely to the (re-)development of the Merwe-Vierhavens. To give the (re-)development of this unproductive waterfront a boost the municipality of Rotterdam and the Rotterdam Port authority N.V. wanted to accelerate the redevelopment of M4H with this joint project team.

***With this renewed collaboration model between city and port the CityPorts project shifted to a ‘new style’ urban area development project.***

In this changing context the municipality of Rotterdam sees itself as a co-producer responsible for the public good on the short and long term. From this perspective the municipality defined a set of desired societal benefits and preconditions to steer future developments in which the municipality takes a facilitating role and provides the framework for implementations, besides allocating space’ (Stadshavens Rotterdam, 2013).

<sup>12</sup> **SO/REO:** Stadsontwikkeling/Ruimtelijk-Economische Ontwikkeling = City Development / Spatial-Economic-Developments

This approach posed a new role for local public authorities, in this case for the port authority as municipality 'as this will not result in blueprints nor direct major financial investments implying a major change towards the classical client-contractor model' (Stadshavens Rotterdam, 2013).

Due to the economic dynamics all actors involved were forced to rethink their role in this urban development project. There was need for new business models, alternative funding possibilities for new activities, and fresh partnerships. Accordingly, as part of the new agreement the port authority became qualified to take the lead in economic developments along the South banks of the Meuse while the municipality is guarding the interests of the city at the North bank of the Meuse. More important, with this new collaboration model the port authority can take an active role in the redevelopment of the Merwe-Vierhavens by acting as investor/developer in which revenues from leaseholds can be used to cover the investments for redeveloping the area.

***With the corporatization of the port authority and its development-led port land policies financial returns of investments are crucial for the projects the port authority is partaking.***

Nevertheless, the Rotterdam Port authority N.V. and the municipality of Rotterdam had to agree on ways in which capital could be brought into the CityPorts projects. Therefore, as part of the collaboration agreement, agreements were made about land transfers from city to port.

Business  
case

However, the business case for the Merwe-Vierhavens redevelopment projects, based on the ambition set in planning documents, resulted in a great financial negative valuation because to realise these projects, big investments were needed related to sanitation, land acquisitions, and infrastructure improvements. In addition, 'these visions were mainly driven by social ambitions related to stimulating innovation and knowledge creation' which do not lead to direct visible returns of investments (Programmabureau Stadshavens Rotterdam, 2011).

Accordingly, in the case of the Merwe-Vierhavens, a pro-active approach in redeveloping the Merwe-Vierhavens was dissuaded, as port and port-related activities were not expected to leave the area soon due to the active fruit cluster and some dry bulk activities. Besides, buying out companies would result in unfeasible plans or could make land acquisition efforts extremely costly due to strategic behaviour among the residing businesses.

***The phasing of the land transfers to the city is heavily influenced by the port activities still present in the CityPorts areas and the ongoing exchange of views on long term developments between Port and City exceeding the scope of this project.***

In addition, the project still undergoes certain difficulties that can hamper the acceleration of the redevelopment project but also makes commitment of both stakeholders more difficult and inconsistent (OBSERVATION BOX: influential related developments).

These plans, ranging from planning for a 3th city bridge to densifying the inner-city of Rotterdam, will not only result in replacement challenges of great financial impact on both city and port on the larger scale. Accordingly, on the urban district level, they also result in projects demanding great investments of both city as port authority. Examples are: large scale sanitation projects; improvements in public space and infrastructure; and the refurbishment of unmarketable industrial heritage.

## OBSERVATION BOX: *influential related developments*

### SUBJECTS OF NEGOTIATION OR DEMANDING GREAT FINANCIAL INVESTMENTS

- Planning for: THE 3TH CITY BRIDGE
- Replacement challenge: THE CRUISE TERMINAL
- Under the barrel: PUBLIC REAL ESTATE FRAUD 'BOOMPJESKADE'
- Under the barrel:

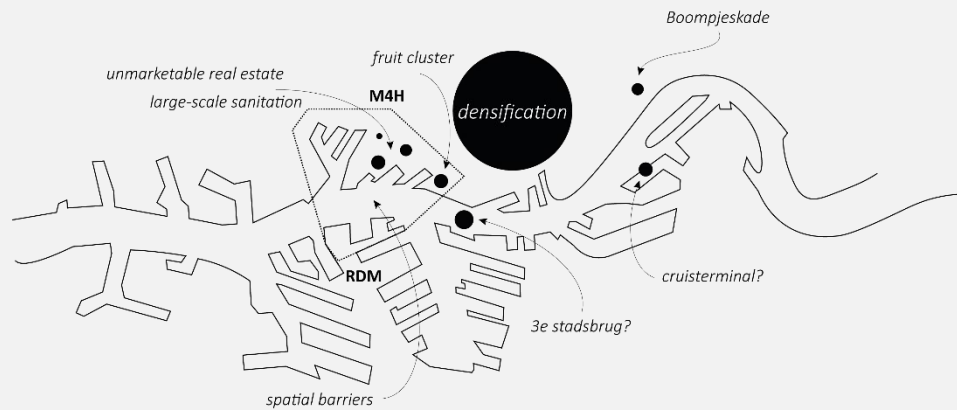


Figure 7.5. Mind-map related influential development (challenges)

- Replacement challenge: STILL ACTIVE FRUIT CLUSTER
- Financial implications: GETTING THE BASICS RIGHT  
on the urban district level in relation to the long term financial strategy of the port authority on energy transition and evolving revenue models
- Connectivity Challenge: CONNECTING RDM & M4H implied to improve location synergy within the Innovation District (Peek, October 2016)

Besides, with the municipal real estate division under the barrel, the municipality has difficulties in taking a pro-active role in the refurbishment of vacant public industrial heritage within the project scope of the Merwe-Vierhavens. This makes accelerating the development of the Merwe-Vierhavens not easier.

There are however examples in the Merwe-Vierhavens in which public real estate is deployed in favour of social and economic value creation focussing on knowledge-intensive activities and accommodating start-ups, creative and innovative entrepreneurs. This is reached through for instance, rent reductions, flexible lease contracts, or an embedded model in which rental prices will increase in line with the tenant his revenues. The same can be said for the port authority. Looking at the development of RDM which turned out a major asset for the port authority as it created a supporting image for the port as hotspot for innovation and the manufacturing industry by accommodating not only over 40 companies but also housing several knowledge institutions.

This project shows the role the Rotterdam Port Authority can play as investor/developer and closely involved landlord. In this case, the port-related activities at RDM are desired by both stakeholders and in line with the ambition to mix education with work – Research, Design, and Manufacturing. Besides, land and real estate is owned by the port authority. Showing a way faster transition from traditional industries to knowledge-intensive activities and collaborations with knowledge institutions. At RDM the port authority focusses on socio-economic return of investment above the economic added value of the project on the short term with the objective of actively contributing to building a future-proof port.

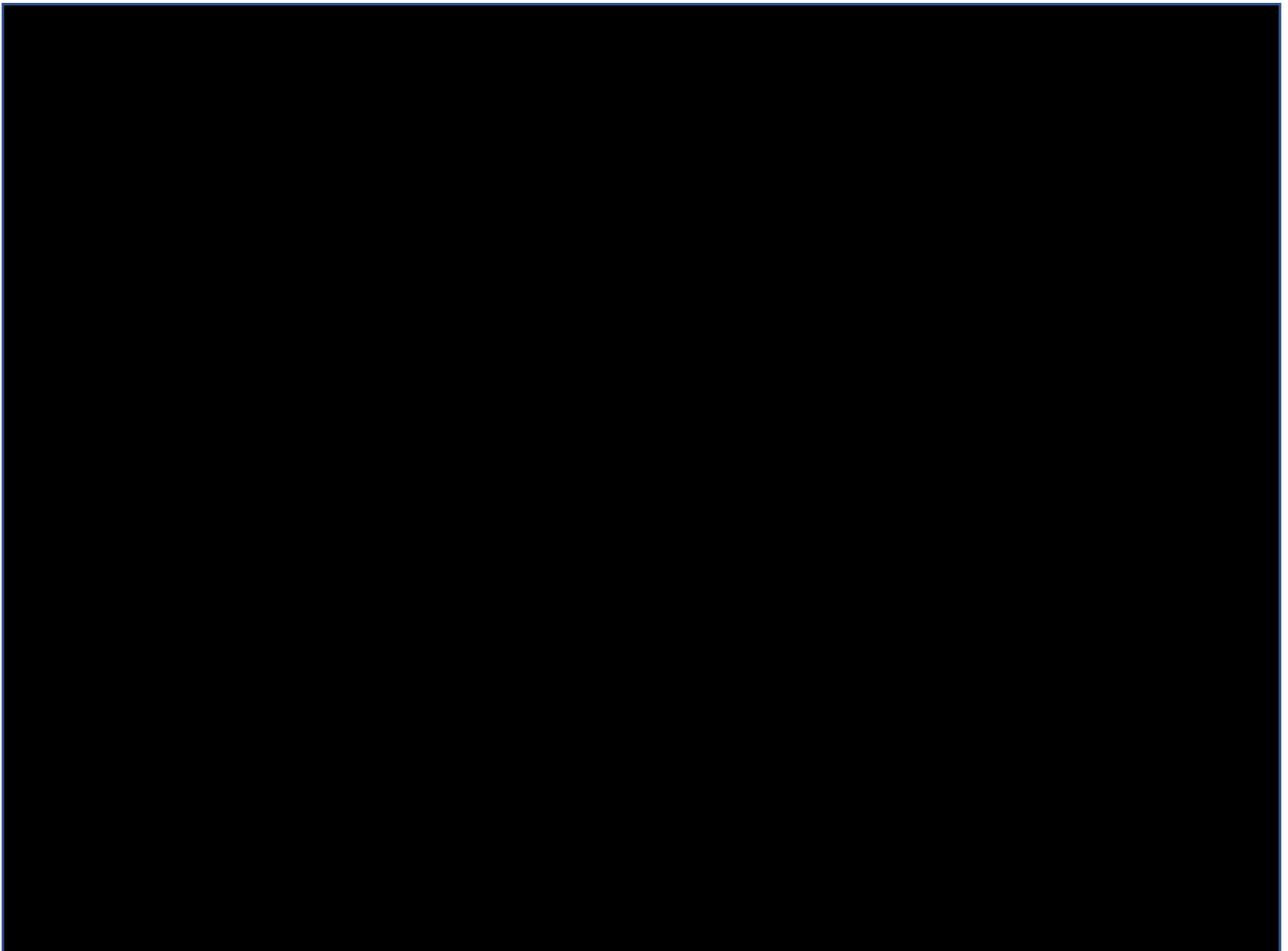
Developer  
role

Most of the land in the Merwe-Vierhavens is owned by either the municipality or the port authority and several leasehold contracts are coming to an end. Stadshavens can steer upon new lease contracts and creating new opportunities and momentum for redevelopment. In the Merwe-Vierhavens land is owned by the Port authority (2/3 comprising over 60 hectares), some parts are owned by the municipality and some plots are privately owned by other actors. This distributions of land results in different forms of ownership. Either the land is:

- Owned by the municipality and to be used by the municipality
- Owned by the municipality and to be used by other parties (leasehold)
- Owned by the port authority and to be used by the port authority
- Owned by the municipality and to be used by other parties (leasehold)
- Privately owned

*Besides ownership of several real estate objects, municipality and port authority have multiple land positions within the scope of the Rotterdam Innovation District*

Photo 7.1. Merwe-Vierhavens.





*These new opportunities are not only driven by site availability but also by momentum created through the common development objective shared by city and port, in favour of creating innovative economic output, because:*

- the port has to innovate in order to reduce its fossil dependency and the city is in need for future-proof job opportunities;
- both entities are facing the uncertain impact of the energy transition, circular economy, and advances in ICT;
- there is need for space to be able to match the growing housing demand in combination with the rise of home-grown knowledge-intensive and technology-driven activities in need for accommodation.

Shared  
development  
objectives

It must be stressed that finding common ground within the CityPorts alliance for redeveloping the Merwe-Vierhavens, have been lacking and common development objectives were less obvious in comparison to, for instance, RDM, Maashaven, and Waalhaven-Oost. Finding these shares ambitions turned out to be very difficult for this specific area due to the complexity of the project and the high financial stakes of redevelopment. Besides, for a long time there was no evident market-demand or pressure for development. Balancing port and city development objectives in this case, while guarding trust and commitment within the long-term contractual relationship between port and city, was very difficult. In essence by the end of 2015 this partnership was seriously endangered and an answer to rethink the collaboration in line with finding common ground was found in the concept of the innovation district.

## 7.2.2. Development dynamics & planning challenges: a public perspective

### *Insights derived from the interviews with members of the M4H project team*

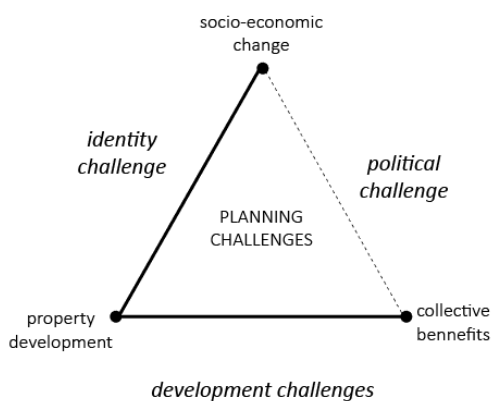
The previous paragraph shows some socio-economic and institutional characteristics of the place in which the Rotterdam Innovation District is planned. Illustrating certain planning processes and the allocation of several resources. Building on these observations and explaining some of these processes seems in place to understand the launch of the Rotterdam Innovation district and the planning and development approach taken by Stadshavens in initiating and realizing this project.

*The redevelopment project of the Merwe-Vierhavens exists on a large scale counting for 140 hectares which has evolved over time and faced several planning challenges posed by:*

- an evolving port-city relationship as explained previously due to the strategic value of the location altering development objectives of port and city on the short term while guarded in the formal collaboration agreements on the long-term commitment;
- continuing port (related) activities which pose environmental contours and hamper accessibility but also making urban development less opportune and difficult;

- political influences and development aspirations that exceed the project scope – like the Waterfront debacle affecting the decisiveness of the municipal real estate department, planning for the third City Bridge pressing the CityPort alliance, directly influencing the position taken by both municipality and Port authority N.V. at the project level;
- and differing financial principles in combination with the availability and allocation of necessary resources to be brought in by both stakeholders. The Port authority acts more as a private actor in need for commercial returns on investments acting in favour of its core business – which is not directly urban development projects. This does not match with the municipality having the more regulating role on the North side of the Meuse promoting residential development on the mid-long term but unable to take an active role.

Accordingly, the decision environment shaping the redevelopment of the Merwe-Vierhavens can be conceptualized into three main planning challenges which have to be dealt with, mitigated, or solved in order to bring the Rotterdam Innovation District to realisation.



1) **Identity challenge:** dealing with the still present port activities in relation to the envisioned urban developments.

2) **Political challenge:** dealing with the altering development dynamics (sometimes exceeding the project scope) within the CityPorts project due to the influence of local, provincial, and state level politics.

3) **Development challenges:** dealing with the different development principles and objectives driving the municipality and port authority within the CityPorts alliance, the dependency on the private sector when it comes to urban developments while dealing with the role of the port authority as major land owner.

Planning  
challenges

Figure 7.6. Planning challenges Merwe-Vierhavens.

These planning challenges are based on the planning challenges introduced in the beginning of this section. Besides, it seems that ‘due to the corporatization of the Port authority N.V. the municipality lost its ‘port knowledge’ and outsourced its port which resulted in a, still lasting, search on how to be an compatible interlocutor for the Port authority N.V.’ while still publicly bearing responsibility for the port of Rotterdam, organized and regulated through zoning plans and safety regulations (Vries, 2017).

In addition, as the ‘Port Authority N.V. has a narrower focus for developments due to its corporatization in comparison to the municipality the Rotterdam Port authority N.V. can react in a very fundamental way mainly fuelled by a lack of progress’ (Vries, 2017). Besides, local politics can cause a change of focus for developments pressuring the CityPorts alliance.

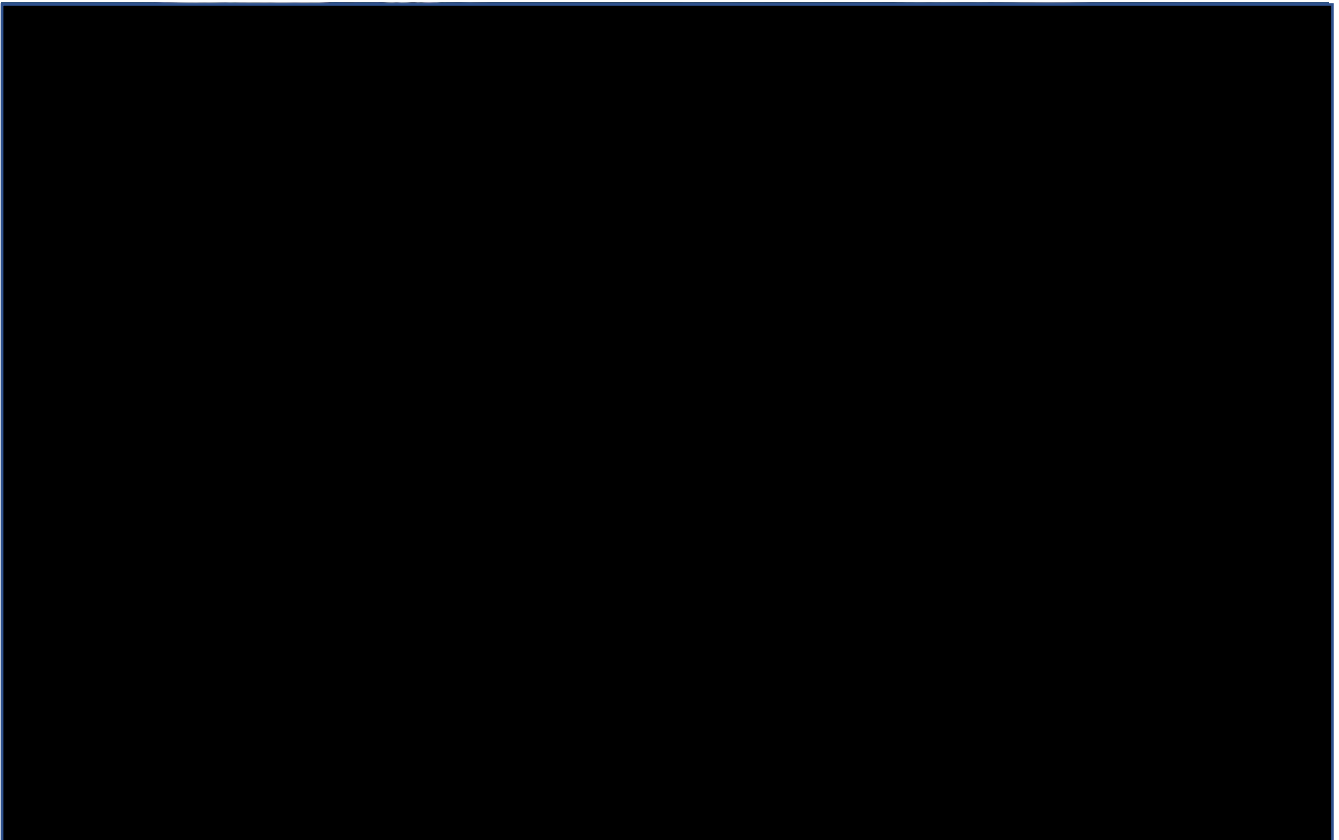
‘Difficulties within the CityPorts alliance mainly occur on the organisational level in defining and designing the collaboration agreement’ (Lamers, 2017). Formulating these formal arrangements takes time and ask for negotiations. As the development strategy for the Merwe-Vierhavens is not based on blueprints, trust is essential. Accordingly, the plans proposed ‘are way more valuable as they require substantial investments while the effects are limited and open to considering changes’ (Lamers, 2017).

The opportunity to add value through these kind of partnerships lies in 'putting collectively first before starting negotiations'. When it's the other way around, its doomed to fail. However, 'depending on the development objectives which are put first and the importance of returns of the short term or long term there is still a risk of who pays, decides' (Vries, 2017).

In addition to these findings the importance of structure can be added. With the launch of the Rotterdam Innovation District new roles and strategies were posed asking different kind of expertise and competencies which were brought into the project team accordingly. Major changes in personnel have a major impact on the organisation of the project creating structural organisational difficulties while structures and organisation should balance the human factor causing inconsistencies (Vries, 2017). Besides, the scale and level of complexity of this project is large as several things are happening at the same time on different scale levels posing different terms which can change monthly in its dynamic.

How Stadshavens deals with these planning challenges, outlined in this chapter, will be analysed in the ACTOR analysis but first an understanding is given on the innovation district initiative explaining the Innovation District propositions.

*Photo 7.2. Merwe-Vierhavens.*



### 7.2.3 The Rotterdam Innovation District proposition

The City-Ports Programme Office was in search for an answer to its endangered partnership with the Rotterdam Port authority N.V. This endangered partnership could lead to an acceleration of land transfers to the municipality for which the municipality was not ready nor well-endowed. Accordingly, external advisement introduced the concept of building an innovation district. Proposed as a solution for the difficulties the redevelopment of the Merwe-Vierhavens was facing by accelerating the redevelopment. The initiative was followed by an exploration on the usability of this urban model as economic redevelopment strategy. Exploratory interviews with the 'early adapters' for which the Merwe-Vierhavens was promoted were held and the successes of RDM were referenced as possible drivers for the innovation district proposition. This helped to reveal the strengths and development potential while enlarging the scope for branding the redevelopment of the Merwe-Vierhavens.

Accelerating developments

***Finding public support for the Innovation District development was reached by addressing the ways in which the concept can benefit the redevelopment of the Merwe-Vierhavens, the city, the port and the greater region.***

The delta region, which includes the cities of The Hague, Rotterdam, Delft, Leiden, and Dordrecht, is one of the most densely populated areas in the Netherlands, accounting for a fifth of the Dutch population and over a fifth of national gross domestic product (Committee of the Regions, 2016). At the Metropolitan scale, comprising 23 municipalities, strong globally competing, economic clusters are still growing in productivity but lacking new innovative growth sectors and employment production especially in comparison to the regions Amsterdam and Eindhoven (MRDH, 2013). Although the Metropolitan region has a large number of strong public knowledge institutions, including Delft University of Technology, Leiden University, and Erasmus University Rotterdam, the region is lacking in innovation-driven companies (Peek, October 2016). As regions compete for companies, investments and human capital, the metropolitan region (MRDH) is challenged to distinguish itself according the MRDH authority by modernizing its traditional sectors like logistics, energy, maritime and health sciences but also grow new sectors like smart manufacturing.

Regional innovation eco-system

These challenges the Metropolitan region Rotterdam-Den Hague (MRDH) is facing were addressed in the innovation district propositions and the possibilities on how the innovation district could help solve them were appointed. Accordingly, the Innovation District proposition stresses that to stimulate economic growth, Rotterdam should broaden its economic profile (OBSERVATION BOX: the innovation district initiative).

***The concept was embraced and initiated bottom-up within the City administration driven by the programme director Stadshavens and followed by the launch of the Rotterdam Innovation District.***

To gain insight into the ways the launch of the Rotterdam Innovation district may affect the development of M4H and RDM the possible impact on the planning approach and development strategy for both areas was explored. The concept of the innovation district seemed to fit the ambitions for redeveloping RDM but deviates from the development strategy defined for M4H. Realising the Rotterdam Innovation District implied 1) a deviation from the current scenario principles defined for the redevelopment of M4H which left room for multiple possible scenario's, 2) the need for more specific ambitions and project definitions for the different sub-areas, and 3) catalyst investments to kick start developments (Pressurecooker, maart 2016).

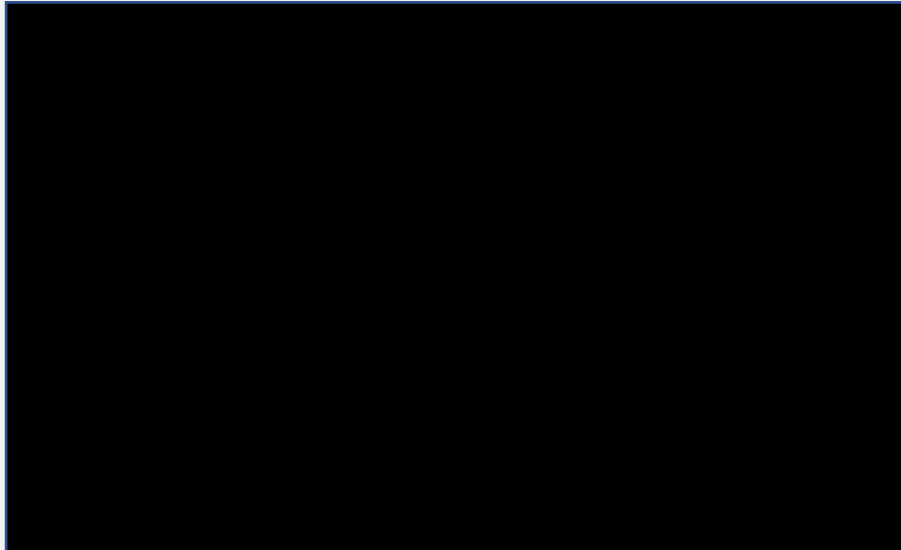
Therefore the initiative had to be followed by the formation of a communication, branding & marketing strategy but above all by a refined implementation strategy. Demanding:

- Commitment of the port authority & municipality
- Acceleration of investments and developments to redevelopment M4H
- An entrepreneurial and risk-taking attitude by both stakeholders able to react as a flexible and decisive organisation in realizing the project

#### OBSERVATION BOX: *the innovation district initiative*

##### **CREATING SUPPORT WITHIN PORT AUTHORITY AND MUNICIPALITY**

*Foundation* - The Rotterdam innovation district initiative was built on present local and regional economic dynamics as the roadmap Next Economy; the exploration on hosting the World Expo 2025 in Rotterdam and the planned land transfers from city to port in relation to the development strategy: 'Get involved in M4H: from city port to skill city' and the growing interest for redeveloping the Merwe-Vierhavens.



*Figure 7.7. Port-City transition through the RID.*

*Goals* - The goals on regional and city level with the Rotterdam Innovation District project are to create employment opportunities, enhance the international visibility of Rotterdam and the region, and to encourage innovation in city management. Therefore, from an economic perspective this project is used to stimulate economic growth for Rotterdam by broadening its economic profile and take advantage of its unique characteristics already present. The Merwe-Vierhavens and RDM-Rotterdam, in this context, are appointed as unique assets that address many ingredients of an innovation ecosystem with the presence of knowledge institutions, business accelerators and an growing number of start-ups (Deloitte Real Estate, 2015).

To what extent these ambitions – both on how to develop and what to develop concerning the Rotterdam Innovation District, are reached, will be explored in the ACTOR analysis and CONTENT analysis following next.

## 7.3 STEP 2: ACTOR ANALYSIS

### *Role-taking by the CityPorts organisation*

#### 7.3.1 Initiating and activating the Rotterdam Innovation District

From the previous exploration on the context in which the Innovation District project takes place can be concluded that to redevelop the Merwe-Vierhavens, municipality and port authority have the ability to activate economic assets as land and real estate. Besides that, they can assign knowledge and expertise in the form of a joint project team under the wings of the CityPorts alliance for planning and managing the redevelopment project rebranded as the Makers District. In addition, the decision environment for redeveloping the Merwe-Vierhavens, has over time been shaped by multiple development plans, indicative visions and strategies posed by Stadshavens. These plans are complementary to the partnership agreement which formally regulates the decision environment for (re)development. The roles formally taken by port authority and municipality are addressed in table 7.1. This chapter will therefore mainly focus on the planning and development approach deployed in the Innovation District development. But first a description on the organisation behind the Innovation District development is in place.

Stakeholder  
profiles

*Rotterdam Port Authority N.V.* - as manager of the port of Rotterdam the port authority has a gain in (re)developing this area as the port authority is mostly interested in the (re)development of the Merwe-Vierhavens for its economic potential due to their land position. Secondly, they see this project as a way to obtain regional support for its activities and strengthen its port position while building on a future-proof port. The core business of the Port authority N.V. is to manage the port of Rotterdam and exploit its land, real estate and water which can be seen as economic assets to retain and foster port (related) activities. Important resources in this context are land and contract management on the exploitation of the water to steer developments. Besides the possibility to invest by bringing in capital.

*Municipality of Rotterdam* - as governor of the city of Rotterdam, the municipality also has a gain in (re)developing this area. First, this area provides many socio-economic opportunities in terms of the development of a living and working environment near the city in relation to the water. Secondly, this area comprise high cultural historic value and has the potential to physically reconnect city and port. From a municipal perspective, especially the Merwe-Vierhavens forms one of the last areas to expand the city at the north bank of the Maas. These areas provide great opportunities for high-quality residential areas close to the water, within cultural-historical valued areas, in short distance of the city-centre. As the municipality also owns land and real estate within the CityPorts project the municipality can deploy these economic assets to create a vibrant working and living environment. Other important resources the municipality can deploy in the CityPorts project is its planning and regulatory instruments as legislation and planning regulations to steer the development.

*CityPorts alliance* - Within the alliance between municipality and port authority the CityPorts organisation is formally responsible for an integrated planning approach. The project organisation has an advising role and mobilizes knowledge, expertise and resources allocated by their superiors.

*Innovation District driver* - The former programme director Stadshavens can be seen as main initiator of the Rotterdam Innovation District project and steering force behind the first propositions on the Rotterdam Innovation district to open the debate on the possibility of implementing a project like this.

*Innovation District project team* - Accordingly as suggested after the launch of the district, the economic propositions and development objectives behind the Rotterdam Innovation District have to be incorporated into the Merwe-Vierhavens redevelopment projects on the urban district scale in combination with a program for implementation on a building level. The former project team of M4H became entitled to do so and the team was occasionally enlarged with experts and colleagues engaged in the RDM project. Over the last 1,5 year this formation altered and brought in specific knowledge and expertise to bring the Innovation District ambition into realisation.

### The planning approach deployed for redeveloping the Merwe-Vierhavens:

#### Planning approach

The implementation strategy following up the economic propositions for realising the Rotterdam Innovation District is introduced as a refinement of the strategy 'Get Involved in M4H: from city port to skill city'. This development strategy was approved by the city council in 2015 and poses a facilitating role for Stadshavens. As a reaction on the prevailing market conditions and changing economy a more bottom-up approach is chosen and private actors are invited to redevelop the area. This development strategy created a point on the horizon to set common goals and ambitions for the development of M4H', according former area manager M4H. In this strategy, municipality and port authority, have a supporting and facilitating role and anticipate on concrete market initiatives. The success of this development strategy lies in the creations of sustainable added value based on how the market gets involved in the redevelopment of the Merwe-Vierhavens and adds economic, social and physical value (THEORY BOX: 'incremental development approach').

***'Get Involved in M4H' can be seen as an open invitation to latent local networks and bottom-up initiatives to create new structures of collaboration in the redevelopment of the area, '(Peek, October 2016)***

To provide an understanding of the envisioned development a spatial plan on large scale connections and an elaboration on five focus areas is given, followed by 'gaming rules' to participate in the redevelopment. This resulted in an adaptable development path based on multiple scenario's providing a flexible framework to incorporate new initiatives. By determining these five focus areas the redevelopment challenge of the whole area is defined in smaller manageable subprojects to mitigate risks; phase investments; and gradually transform the area and add value (Buitelaar, 2012).

For redeveloping the Merwe-Vierhavens as Innovation District the market is still invited in jointly redeveloping this area, as there are less possibilities for public investments that can leverage private sector resources. Besides, municipality and Port authority N.V. rely heavily on private sector involvement when it comes to the realization of the more urban development objectives within the innovation district vision. However, 'for the development of the Rotterdam Innovation District port authority and municipality will occasionally take the lead in attracting and accommodating new facilities. Nevertheless, these have to be picked up by the market eventually' (Lamers, 2017).

## THEORY BOX: 'incremental development approach' IN URBAN AREA DEVELOPMENT

In contrast to traditional blueprints an organic urban area development approach is chosen. How to reach these common goals and ambitions is therefore not set in stone. This allows the market to participate in the revitalisation of M4H (Schaeken, 2014).

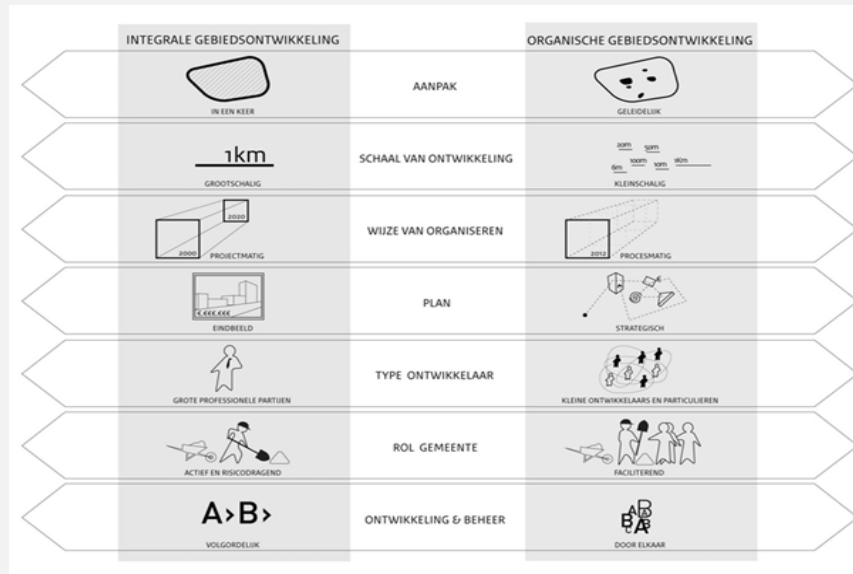


Figure 7.8. Difference between integrated and incremental urban area developments.  
PBL & UUD (2012)

This incremental development approach assumes that the future is unexpected and multiple project outcomes are possible. Small-scale initiatives are strategically chosen, organical growth is promoted and bottom-up initiatives are allowed. In addition, these developments focusing mainly on the end-users rather than targeting investors and developers (De Boer, 2013).

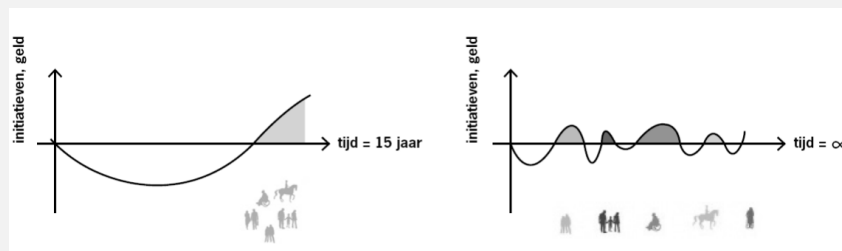


Figure 7.9. 'De badkuip' vs cashflow management. (Provincie Utrecht, 2014)

This incremental development approach also provides the opportunity to deviate from the traditional GREX method and focus on cashflow management. In this way different cashflows are combined to create multiple opportunities to re-calibrate the development strategy taken more often (Provincie Utrecht, 2014).



*‘The present entrepreneurs play a crucial part in the development of the area – they are the driving force behind M4H.’*

(Programmabureau Stadshavens Rotterdam, 2015)

Collaborative  
planning

In line with the redevelopment strategy ‘Get involved in M4H’ and already first mentioned in the area plan of 2009 ‘Pionieren aan de Maas’, the Rotterdam Innovation District, is driven by and promoted for its current and potential end-users and not directly targeting investors and developers yet. Several iconic end-users are utilized as ‘area ambassadors’ in which agreements are set exceeding financial transactions alone implying substantive involvement in the redevelopment project concerning the Merwe-Vierhavens. Involving these end-users, as for neighbourhoods surrounding the project scope and private actors, in the planning process is not always praised by the M4H project team. Because collaborative planning brings along several difficulties as these actors also have a certain angle or gain and it is unclear if they understand or support the development objectives represented by Stadshavens which is in the end responsible for the management and development of the project’ (Lamers, 2017).

In addition, port authority and municipality are still in search for a proper formal role-division fitting the innovation district project. Because, from this exploration can be stated that between the launch of the Rotterdam Innovation District in November 2015 and now, the incremental urban area development approach chosen for the development of the Merwe-Vierhavens is still applicable for the roles deployed by Stadshavens formally while collaboratively planning for the Rotterdam Innovation District. A catalyst development has not followed because the process to structure the organisation of the Rotterdam Innovation District is taking time. This can be explained through the planning challenges identified throughout this exploration.

Pro-active  
development  
approach

On the operational level the performed roles by the M4H project team within the development of the Rotterdam Innovation District gradually alter towards a more pro-active development approach. This more pro-active development approach is reflected in small scale projects shifting from planning for the innovation district to the actual development. In this shift real estate objects are gradually acquired and activated by the port authority; events are showcasing the smart manufacturing cluster present in the area; and expertise is gathered from both port authority as municipality to finalize and operationalize the innovation district ambitions. Accordingly the refined implementation strategy is being translated into an accommodation strategy to attract the envisioned end-users; a spatial framework and refinement of the planning tools (like the zoning plan) to guide future developments; and a translation of the programme of implementations into the business case.

The role-taking by Stadshavens in the Innovation District development elaborated on in this chapter, is conceptualized in the following figure (7.10) stressing the shift from a planning and regulating role towards a more facilitating and slight entrepreneurial role.

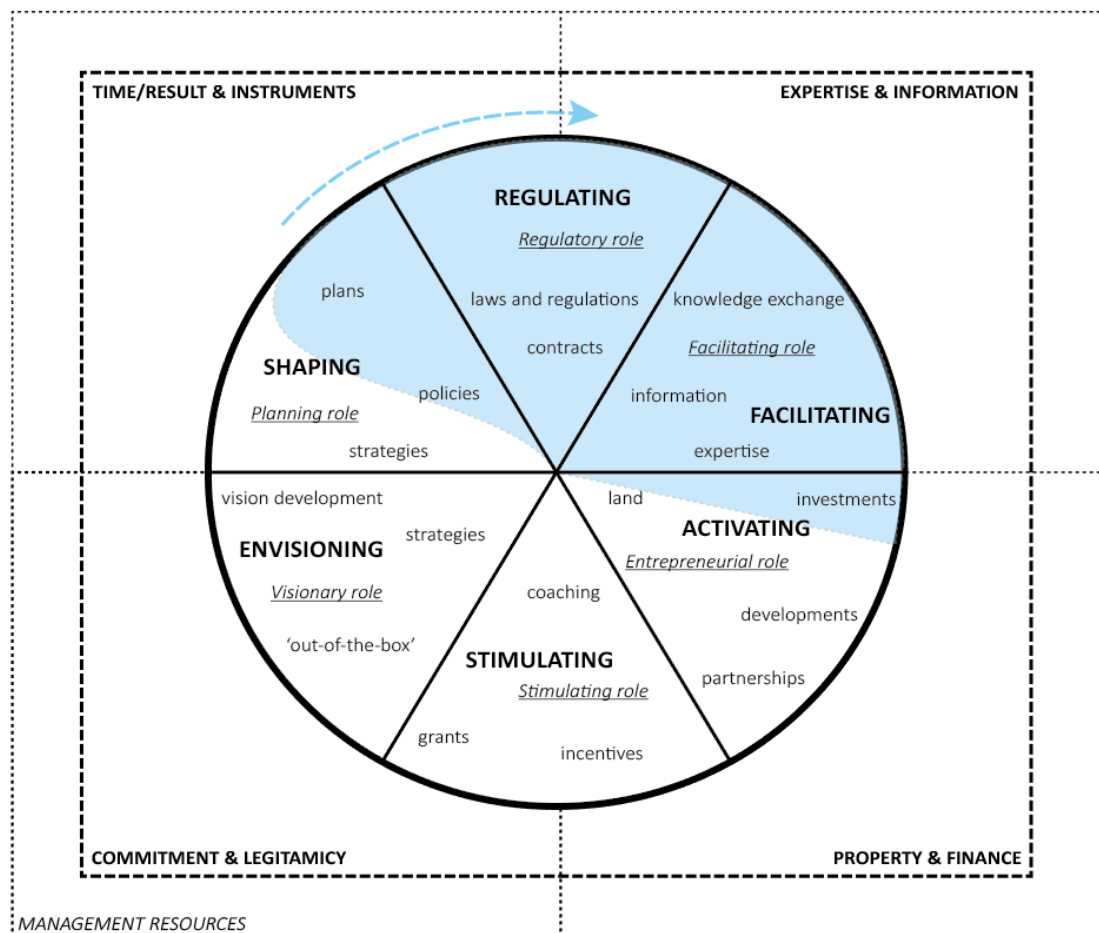


Figure 7.10. Deployed planning approach .

How the end-users, promoted as the innovators accommodated in the Merwe-Vierhavens envision and experience the roles (to be) taken by Stadshavens Rotterdam is explored in the next chapter.

### 7.3.2 Desired planning & development approach: the innovator perspective

#### *Lessons from practice based on observations and interviews*

Last year the municipality of Rotterdam invited the Urban Land Institute (ULI)<sup>13</sup> to share knowledge and expertise and explore the challenge of building the Rotterdam innovation economy. Specific notions on the planning and development approach concerning the Innovation District Development stress the importance of investments needed to bring the project into the next phase. This demands a deviation from the current incremental development approach towards a more 'strategic and experimental approach when it comes to land use and planning' (Clark, Moonen, & Peek, 2016).

Innovator  
perspective

This more strategic and experimental approach can be refined when acknowledging the following findings obtained during this exploratory research. Because, as the Rotterdam Innovation District project seeks urban economic renewal in innovative capacity, Stadshavens should adopt a position in which a more active role in facilitating the processes leading to innovation is taken and at the same time a pleasant working and living environment is created. Because, local public authorities have also clear roles to play concerning their core tasks as maintenance of public space.

***The municipality can and should engage in multiple roles ranging from investors to customer while providing a neutral basis on which different parties can be joint.***

As local public authorities can take (and are obliged with) multiple roles it is important to know which role will be served by who. Some of the respondents questioned during this research see their interactions and relations with Stadshavens in practice as uncertain, inconsistent and changeable. As the municipality is such a multi-faceted organisation it takes time finding the right 'counter'. Besides, in the 'Get involved' development strategy, which provides multiple scenario's and invites the market to take the lead, entrepreneurs and real estate developers indicate that too many risks and uncertainties rest with the market.

***Uncertainties are found in the roles and responsibilities taken by Stadshavens when it comes to possible partnerships.***

Partnerships

It is not always clear what type of partnership is foreseen between Stadshavens and the end-users ranging from transaction-based commissions to long-term commitments. Some of the end-users questioned during this research feel insufficient involved in the planning process of the Rotterdam Innovation District. The current approach does not feel as jointly forming a process as equal stakeholders because there is a difference in creating a vision jointly or by promoting end-users in publications and economic propositions. To reach an equal partnership and construct concrete arrangements, more structural and consistent interactions and discussions are essential to build a more strategic partnership in which a common goal is set for a certain period of time. Especially in relation to the ambitions for transforming the area. Because, it is believed that, the very essence lies in the commitment established within these partnerships. This determines to what extent the promoted end-users can actually function as an incubator to help transform the Merwe-Vierhavens into the envisioned Innovation District. Unfortunately, practice shows the difficulties public authorities have in providing this commitment and sticking to it by not changing priorities over day.

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<sup>13</sup> **ULI:** ULI has a strong network within real estate markets across 27 countries in Europe comprising 2900 members in the field of real estate and land use policy and brings their members together to exchange best practices and explore urban issues within their community.

As a collective effort seems essential to activate an innovation district and to stimulate innovation at the area level (Lekkerkerker & Raspe, november 2016) equal partnerships may help developing the innovation district. However, not all promoted end-users are in search for collaborative planning processes in developing the Rotterdam Innovation District (Schmitt, 2017). They are in need for a flexible, affordable and inspiring accommodation and find in the port authority or the municipality a landlord with whom their relations is based on a formal contractual arrangement.

***‘When development strategies are lacking comprehensibility, entrepreneurs or real estate parties are not likely to invest as these development ambitions set are too ambiguous. When vision is lacking developers install great margins resulting in unfeasible plans.’*** (Borst, 2017)

We have learned that the lack of tangible plans, fixed ambitions and targets pose uncertainties on which the market does not want to speculate, can result in an interlock development. Therefore, specifying economic ambitions related to innovative output, and linking these topics to a spatial framework and program for implementation (in which flexibility and adaptability are key!!) can result in more tangible plans. Accordingly creating planning gain for investors/developers to get involved. Because, despite the fact that the real estate market might still be seen as a quite inflexible market in which traditional ways of thinking focus on revenue flows in relation to investments on a building level, an entrepreneurial attitude and creative thinking can be found with private actors as well so, in this case, local public authorities, do not have to keep reinventing themselves but start inviting the right partners to join forces with.

Besides that, the lack of decisiveness, funding and availability of marketable space in relation to the regulating role deployed by Port authority N.V. and municipality can hinder future developments. This more laissez-faire approach, suggesting that industry-university collaborations will eventually foster innovation in which port authority and municipality take a re-active development approach, can make it difficult to actual add value to the project and deliver on the objective of contributing to the innovation ecosystem even though it might be stated in the development strategy. This approach should therefore shift towards a more pro-active approach in which developments are actively promoted and catalysed by providing a greater action perspective and access to funding through for instance the redistribution of incentives or the expansion of mandate for the Stadshavens Programme Office to act more independently from local politics.

Activating the development

In conclusion, both in research undertaking by the ULI institute and confirmed in this exploration is the believe that the more facilitating role of municipalities has to be replaced by a governing role in which policymaking is followed by actual interventions. It must be acknowledged that activating the Rotterdam Innovation District is not only reached through a shift towards a more pro-active planning and development approach demanding the activation of hard management resources as land, real estate and capital. Local public authorities can use soft management measures to share information on the long-term development strategy and keep involved or interested parties on board. Besides through expertise the project can be shaped in favour of stimulating innovation through planning instruments as building rights and the coordination of public land uses. Commitment and legitimacy on the other hand can help to speed-up planning and permits or provide incentives to stimulate the desired activities.

Besides, both from planning examples and this reflection must be stated, that the presence of a strong (political) ‘promoter’ – like with the mayors of Boston and Barcelona, may also help to create commitment that can help tempting the private sector and accordingly activated developments.

The desired and more effective role-taking by Stadshavens in the Innovation District development elaborated on in this chapter, is conceptualized in the following figure (7.10) stressing the importance of a leadership vision translated into clear development plans; the use of 'soft' management measures to achieve objectives in favour of stimulating innovation and the processes leading to it (e.g. planning instruments and expertise); and the need for entrepreneurial partnerships or private sector involvement to activate the innovation district development.

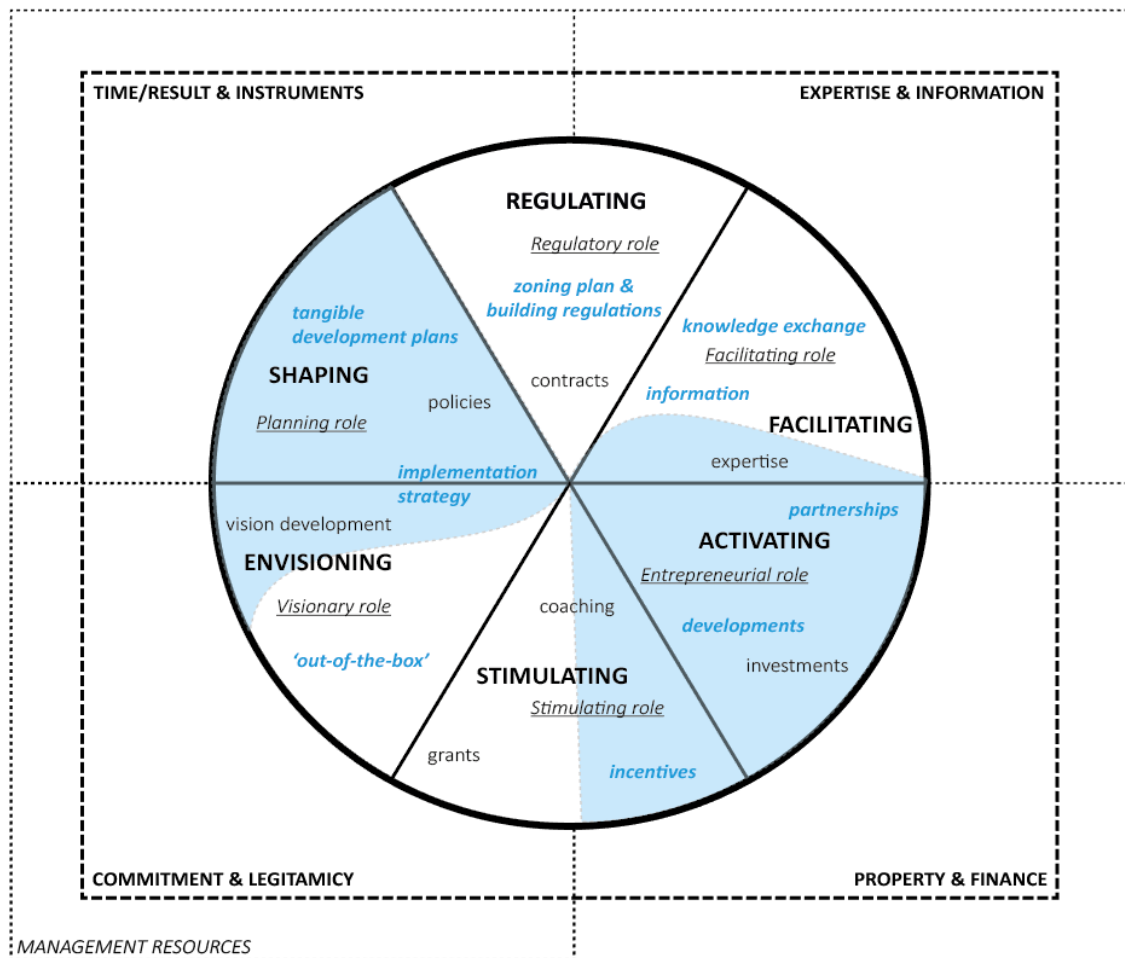


Figure 7.11. Desired planning approach.

## 7.4 STEP 3: CONTENT ANALYSIS

*This chapter is built on a documents analysis, observations from practice, and interviews with the end-users promoted for their innovative output and presence in the Rotterdam Innovation District.*

### 7.4.1 Analysing the Innovation District development strategy

Planning documents and strategies that shape the decision environment in which urban area developments take place, can indicate the spatial conditions aimed for. Accordingly they identify the physical requirements needed to realise the envisioned project outcome. In the case of the Rotterdam Innovation District development, the program of implementation forms a refinement of the 'Get Involved in M4H: from city port to skill city' strategy. This implementation strategy becomes leading for future developments. This strategy builds on the vision for redeveloping the CityPorts as communicated in the 'Structuurvisie Stadshavens 2011' and is underpinned by common goals defined by both port as city. This renewed strategy focusses on the economic synergy between RDM and M4H and can be seen as a more detailed understanding of the ambitions, strategies and planning approach for the redevelopment of the Merwe-Vierhavens in relation to RDM.

Planning  
documents

*To analyse how innovation is envisioned to be stimulated through the built environment this chapter will assess the spatial conditions and physical interventions defined in the innovation district propositions and the implementation strategy.*

The Structural Concept of 2011 forms the base for the development strategy concerning M4H: 'Get involved' and will therefore be analysed as well. RDM and Merwe-Vierhavens are promoted in this document as breeding sites for knowledge creation making room for over 4500 to 6500 dwellings in combination with companies, supportive facilities, and testing ground for innovative energy supply and water management. Based on the lessons from theory the Structural Concept provides several ambitions and decisions on this urban district level in favour of stimulating innovation:

Structural  
Concept 2011

- o Ambition: Linking residential developments to accommodating knowledge institutions
- o Ambition: Attracting urban pioneers, followed by urban communities and status-oriented users<sup>14</sup>
- o Ambition: Exploring connections over water
  
- o Decision: High densities, mixed-use, small scale housing projects
- o Decision: Improving public transport networks and slow traffic connections
- o Decision: Flexible environmental policy framework in favour of experimentation
- o Decision: Pre-investments in spatial quality
- o Decision: Define and record important sightlines, greenery, and public space near the water
- o Decision: Redevelop and maintain monuments and prominent buildings

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<sup>14</sup> **status-oriented users:** 'trend followers' – referred to as the early majority reflected in service-oriented, more status-sensitive citizens and entrepreneurs and active young urban people looking for an attractive work, learning and leisure environment. (Programmabureau Stadshavens Rotterdam, Spatial Act 2011, 2011)

‘Get  
Involved  
in M4H’

Due to changing development dynamics and the formal role-division between port authority and municipality the execution of these decisions were mainly postponed. Accordingly a flexible development framework was created in favour of bottom-up initiatives. The redevelopment strategy ‘Get Involved in M4H: from city port to skill city’ poses programmatic scenario’s and ‘gaming rules’ to facilitate and react on market initiatives. In terms of stimulating innovation in the Merwe-Vierhavens the following envisioned spatial ambitions and physical interventions stand out:

- o The ambition to realise several public parks, public wharfs and sightlines
- o The appointing of monuments, iconic structures and buildings
- o The emphasise on area branding and communication through signing
- o The need for better connections within the area and with it surroundings
- o The possibilities for experimentation and placemaking
- o The importance of recognizable and iconic end-users to boost the development

In these ambition the built environment becomes a catalyst to attract urban pioneers and early adaptors by improving attractivity through an improved quality of public space and district branding in combination with the emphasize on authenticity by means of promoting monuments and iconic structures. Besides that the built environment becomes an enabler of experimentation and placemaking to create a diverse and supportive environment in which the envisioned activities and iconic end-users are facilitated through accommodation and improved connections improving accessibility. It is however import to stress that in this redevelopment strategy both municipality and port authority do not pre-invest to reach these ambitions and accelerate the redevelopment of the area. It is believed that the area must first transform more organically to create critical mass.

Rotterdam  
Innovation  
District

With the launch of the Rotterdam Innovation District, Stadshavens implies to break with this approach by stressing the importance of accelerating developments. Accordingly, the Merwe-Vierhavens and RDM-Rotterdam became appointed as unique assets that address many ingredients already in place. The Innovation District is promoted for its 1) simplified legislation for experiments; 2) the refurbished monumental port industrial heritage promoting authenticity and strong district identity; 3) the variety of platforms that supports the scale-ups and connects them to the regional innovation system; 4) the proximity to the city centre 4) its connectivity over land and water; 5) and the multiple possibilities for new developments by means of flexibility in space; plots, unconventional real estate objects and room for experiments; 6) and potential in attractivity of public space in relation to the water (Pressurecooker, maart 2016).

In this respect the urban district the built environment is utilized for 1) the availability of space to accommodate knowledge-intensive and innovation-rich activities; 2) the presence of makerspaces and co-location possibilities fostering knowledge spillovers; 3) and the iconic port landscape providing monumental industrial heritage reflecting the port-city identity of Rotterdam.

Before launching the innovation district four main challenges where defined which were lacking refinement and are in need for improvement to meet the innovation district ambition.

- 1) places to meet within the district;
- 2) accessibility and public transport;
- 3) active and smart use of vacant and unmarketable industrial heritage;
- 4) vibrancy through the mix of uses incorporating housing.

These spatial conditions are incorporated in the implementation strategy to enhance a 24H culture and mixed-use development.

Spatial level	Envisioned spatial conditions
<b>Infrastructure</b>	<ul style="list-style-type: none"> <li>• Improved connectivity with surrounding neighbourhoods</li> <li>• Improved accessibility through slow and fast routes</li> <li>• Improved connections within the area and with its surroundings</li> </ul>
<b>Public space</b>	<ul style="list-style-type: none"> <li>• Improved quality of space through water access for recreation where possible</li> <li>• Improved attractiveness of place near the waterfront</li> <li>• Realising several public parks, public wharfs and sightlines</li> </ul>
<b>Function mix</b>	<ul style="list-style-type: none"> <li>• Enhancing vibrancy of place through hospitality amenities, and placemaking</li> <li>• Diversity in function and people by mixing working-living-leisure</li> </ul>
<b>Property development</b>	<ul style="list-style-type: none"> <li>• Development of a central meeting point in the centre of the Makers Park</li> <li>• Allowing residential developments in time when mixed in use</li> </ul>
<b>Urban form</b>	<ul style="list-style-type: none"> <li>• The re-use of monuments, iconic structures and buildings</li> <li>• Emphasising area branding and communication through signage</li> </ul>
<b>Environment</b>	<ul style="list-style-type: none"> <li>• Providing experimental place, living labs on water and land</li> </ul>

Table 7.2. Desired spatial conditions by Stadshavens in the implementation strategy.

These spatial conditions are envisioned to raise the quality of life and enhance diversity of place (table 7.2). These spatial ambitions match the demand and growing trend to favour urban living in which metropolitan residents are choosing to work and live in places that are walkable, bike-able, and connected by transit and technology (Florida, 2014). However, from theory can be stated that location preferences of companies can be driven by multiple reasons ranging from cost reduction and cluster potential to institutional support and attractiveness of place (table 6.2). In addition, innovation can either be incremental or radical and the processes leading to it can be of individualistic or collaborative nature. Besides innovation can be more creative, technical or ‘process-organisation’ orientated, referring to the differences between alphas, gammas and betas and demanding different spatial conditions (Spencer, 2015).

Spatial  
conditions

*To mitigate the risk of planning for an innovation district built on the ambition of stimulating innovation but in the end getting neglected by the actual innovators ‘Stadshavens defined a specific target group to develop an innovation-rich milieu complementary to the innovation ecosystem of Rotterdam’ (Gebiedsteam M4H, 2016).*

Start-ups, knowledge institutions, manufacturing companies, and creative entrepreneurs are targeted with 1) an expected demand for *flexible, available and affordable spaces* allowing co-location to reduce overhead costs and enhance knowledge spillovers; 2) *experimental space to design, prototype and showcase their inventions*; 3) and *urban amenities to complement functionality of location with attractiveness, experience and blending working, living, and leisure, are desired* (figure 7.12).

In this context, the built environment is envisioned as 1) enabler of idea generation and application through experimental space; 2) an influencer of the density of social interactions through urban amenities; 3) and a facilitator of the concentration of innovation-rich manufacturing activities through a supportive environment.



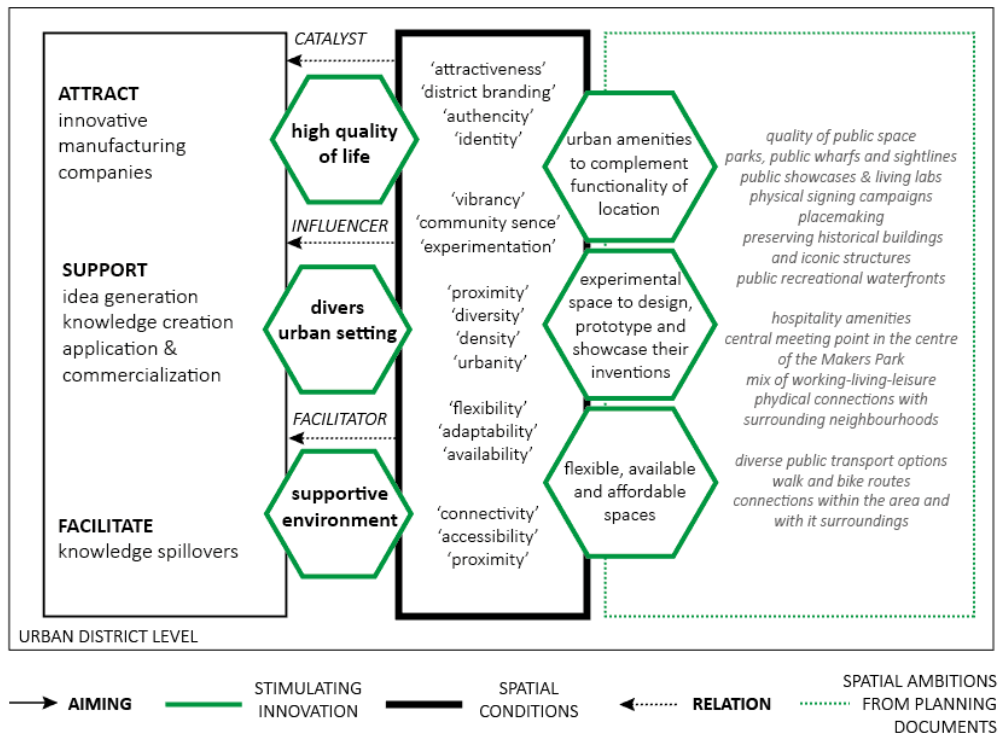


Figure 7.12. Spatial ambitions defined and desired by Stadshavens, project team M4H.

When looking at the envisioned infrastructural improvements and redistribution of collective benefits through the quality improvements of public space ‘no direct visible returns of investments on the short term’ can be expected when not picked up by the market, in line with the previous development strategies.

*As this spatial conditions demand large investments in collective benefits and is not aiming for only economic but also spatial and socio-economic value creation, tempting the private sector to co-invest can be difficult. Besides, the regulatory role of both port as municipality as landlord and real estate owners makes creating planning gain for private actors challenging.*

The Merwe-Vierhavens comprises 140 hectares in which sub-areas are defined due to differences in scale, density, urban lay-out, and land ownership. Some areas ask for minimal spatial interventions and refurbishments by Stadshavens while larger brownfield developments ask for major real estate developments. ‘Area profiles’ for each project are created which all incorporate the ambitions of a mixed-use development but differ in accessibility and connectivity; desired supportive facilities; quality of public space; and functionality. For example some areas provide opportunities for accessibility to the water while others are in need for new environmental regulations to exclude industrial activities that may hamper urban developments.

To deal with the development challenges explored in the context analysis the scope for redeveloping the Merwe-Vierhavens in favour of the Innovation District proposition is narrowed down to mitigate the risks of interlocked developments on contracting development objectives. Accordingly ‘focus areas’ within the Merwe-Vierhavens are defined assuming that the other areas will transform gradually in time, picked up by the market.

Project  
scope

The 'gaming rules' defined to assess the desirability of a particular private-led development or accommodation request, intends to secure also the socio-economic value creation. To assess if a new initiatives fits the brief and vision for the overall redevelopment and benefits the area business case, its social, economic, and physical value creation is examined. Urban value creation is, in this context, associated with facilitating social and economic developments, enhancing sustainability improvements, and improving the attractiveness of place (Programmabureau Stadshavens Rotterdam, 2015).

Adding  
urban value

***In theory the added urban economic, social, and physical value refers to a well-designed built environment through good urban design and spatial quality able to deliver social, environmental, and economic benefits (Macmillan, 2006).***

With the ambition set more specifically on accommodating knowledge-intensive and innovation-rich activities linked to smart manufacturing these 'gaming rules' can be improved with more 'innovation-specific' input and output indicators. Besides improved 'gaming rules' the current spatial framework and design guidelines is lacking specification. The implementation strategy drawn up for the purpose of the Rotterdam Innovation District stresses the importance of a flexible spatial framework. This spatial framework has to refer to connectivity improvements and site availability in which, for instance, slow traffic routes are specified and development potential is identified.

Spatial  
framework

It must be acknowledged that in line with the lack of refinement in the spatial framework, basic principles on the area level to realise the 24H culture are yet missing. This relates to the difficulties posed by mixing residential developments with still present industrial activities. Port authority and municipality have to formulate basic principles on how to deal with this challenge to create effective planning tools related to zoning, legislation and contracts, that can help realise the innovation district ambition.

The extent to which the built environment already stimulates innovation in the Merwe-Vierhavens in combination with the exploration on the desired spatial conditions from the perspective of localisation behaviour by the *actual innovators* will be explored in the next two chapters.

## 7.4.2 Stimulating innovation through the built environment: a critical reflection

Allocating  
the right  
place

The Rotterdam Innovation district is promoted as the testing ground and display window for new technologies as a reflection of the next economy. This means production, prototyping, and manufacturing flowing back into the city, driven by technological possibilities and smart techniques. For the Merwe-Vierhavens this is translated in the ambition of creating a mixed-use area in which innovative activities meet with residential developments, supported by urban functions. Critical mass is created gradually to create support for extra neighbourhood supportive facilities that can accordingly attract more companies, residents and visitors. As defined in previous chapter the area is promoted for 1) flexibility in space; plots, unconventional real estate objects, room for experiments, 2) authenticity and identity of port structures, 3) potential in attractive public space in relation to the water, 4) identity of proven place-based successes in relation to the refurbishment of iconic buildings, 5) closeness to the city centre or Rotterdam. However from urban studies on the redevelopment of the Merwe-Vierhavens (Clark, Moonen, & Peek, 2016), the interviews with the actual innovators located in the area, a critical analysis reflecting on present spatial conditions is in place.

First, it must be acknowledged that the Rotterdam Innovation District, initiated as top-down urban economic strategy but initiated bottom-up within the local public authority is driven by development objectives on the urban district level which may contribute to realising economic ambitions as job creation on a city and regional scale. However, developments on the urban district level within the scope of the Rotterdam Innovation District must be placed in the context of what is already happening around the region and city (Clark, Moonen, & Peek, 2016).

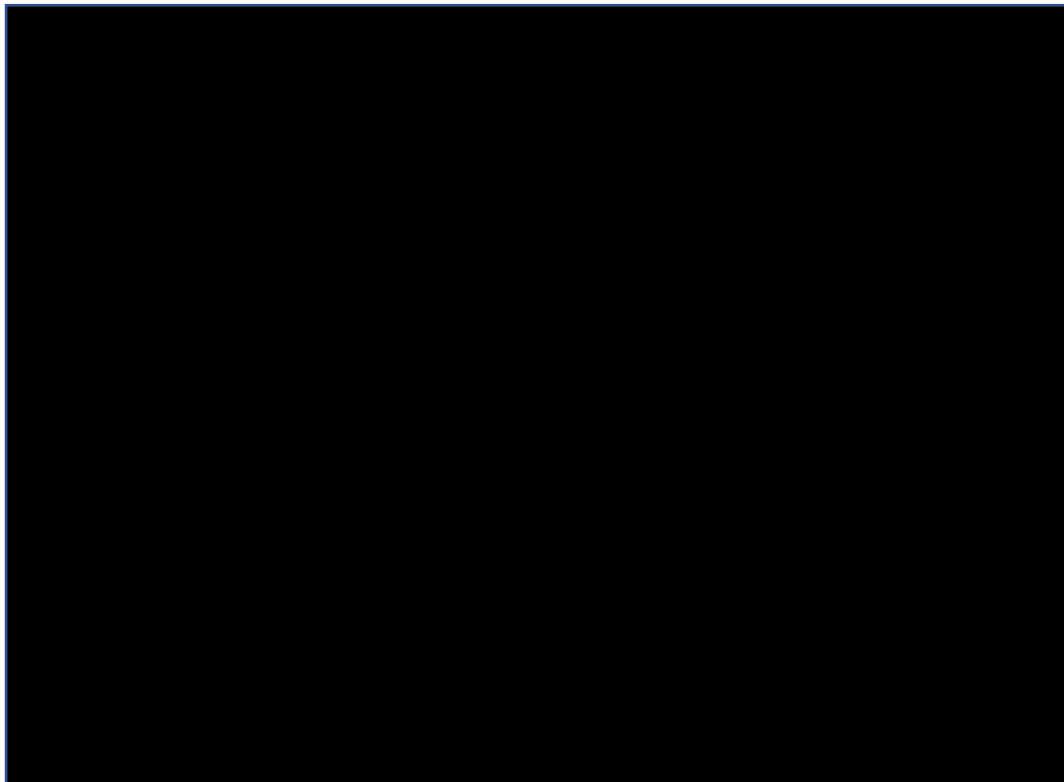


Figure 7.13 knowledge-intensive activities Rotterdam. (Rotterdam, 2015-2016)

When looking at Rotterdam (figure 7.13) most knowledge-intensive activities take place near or in the city centre clustering on a building level around knowledge institutions, knowledge-intensive companies and clusters of creative entrepreneurs. Within the scope of the Rotterdam Innovation District knowledge-intensive activities take place mainly at the RDM campus and in the Merwe-Vierhavens at the Science Tower (Marconiplein), Spark Design (Keilehaven) and Marconistraat 52 (just outside the innovation district scope).

In this context, the Rotterdam Science Tower can be seen as a significant knowledge-intensive cluster within Rotterdam forming a physical node representing the early majority<sup>15</sup> for the Rotterdam Innovation District functioning as an incubator in the transformation of the area image with over 1500 visitors per day. In addition, the Merwe-Vierhavens, on a distance of 5 kilometres of the city centre – 20 minutes by bike and car, accommodates besides these knowledge-intensive clusters many creative entrepreneurs clustering in multitenant buildings as Keilepand 9, Gusto45, Marconistraat 52, Keilewerf, SuGu-warehouse and SPECK design dock. These buildings are home to a variety of creative and innovative entrepreneurs (figure 7.14). In this respect the Innovation District is fairly promoted for its closeness to the city and the presence of proven place-based successes in which idea generation and application is reflected in co-location, refurbished and inspiring warehouses, makerspaces, ateliers and labs. Concentration of innovators

*Figure 7.14 multi-tenant buildings within the Rotterdam Innovation District.*



This concentration of innovators ranging from pioneers to early adapters entails several ‘individual innovators’ like studio Roosegaarde. This is an example of a knowledge-intensive company/design studio not so much embedded in what is happening in the area but however an important asset to the Rotterdam Innovation District in terms of its positive affect on the district identity. These type of end-users has positively impacted the districts’ image however from the interviews can be concluded there is a lack of substantial linkage between them despite their relatively close geographical proximity.

Knowledge spillovers may happen on the building level but besides that the actual innovators are weakly attached to the area in terms of collaboration and network. They show limited internal linkages due to the lack of continuing and systematic interactions. In theory, these types of clusters are referred to as innovation clusters in which the importance of the individual innovator has begun to re-assert itself in the innovative process within the cluster (Hart, 2000).

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<sup>15</sup> **early majority:** ‘trend followers’ – service-oriented, more status-sensitive citizens and entrepreneurs and active young urban people looking for an attractive work, learning and leisure environment. (Programmabureau Stadshavens Rotterdam, Spatial Act 2011, 2011)

Regardless the fact that at the moment the Merwe-Vierhavens functions more as a proximity clusters the envisioned spatial conditions mentioned in the previous chapter reflect the necessary spatial conditions to improve the quality of life, create a divers urban setting and accordingly stimulate open innovation (figure 7.15).

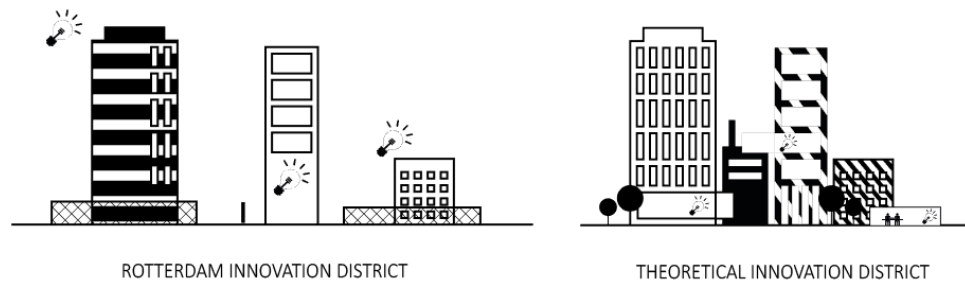


Figure 7.15 the Rotterdam Innovation District in practice.

The rationale behind these spatial ambitions, focusing on attracting human capital, is based on the belief that when focussing investment on providing an attractive living and working environment, human capital will follow. In practice however these ambitions have not been realized so far. Despite the availability of space and real estate objects little new establishments have been accommodated since the launch of the innovation district and despite the potential for attractive public space in relation to the water no public parks or wharfs are yet realised. This can be explained due to the fact that wharfs are still occupied by companies outside the public domain and vacant real estate objects are demanding great investments to refurbish them (figure 7.16).

Attractivity  
of place

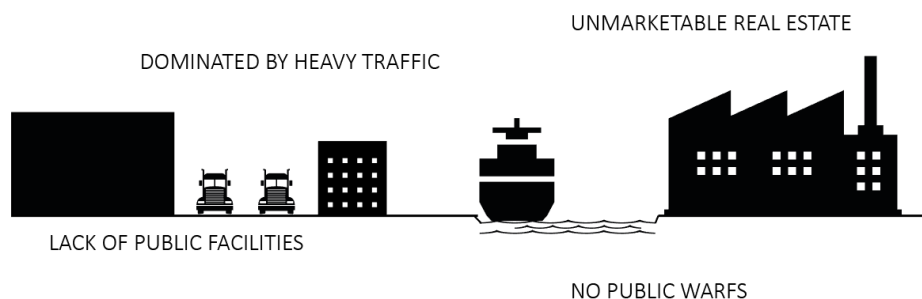
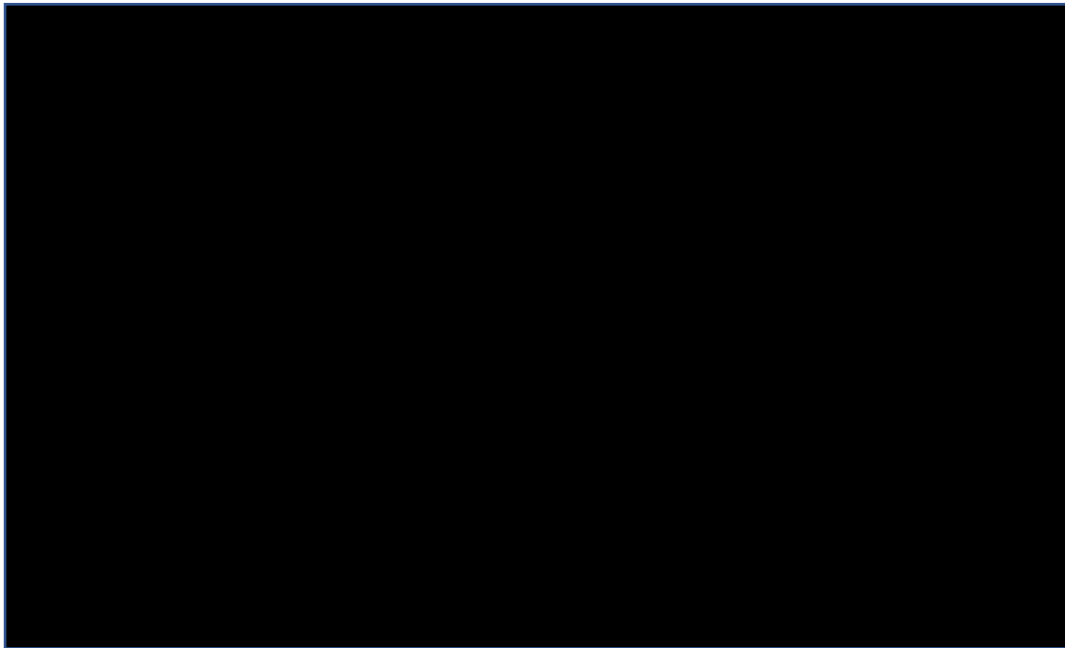


Figure 7.16 the Rotterdam Innovation District in practice.

When looking at the attractivity of the Rotterdam Innovation District yet lots needs to be improved as the area still very much functions as a wide spread-out and monofunctional business park. It must be acknowledged that the neighbourhoods directly surrounding the Merwe-Vierhavens are lacking physical connections with the Innovation District due to a large infrastructural barriers; the Merwe-Vierhavens still represents an industrial site so there is no actual measurable living environment to assess the quality of life properly as housing is not present yet; and urban facilities are lacking due to the monofunctionality of the place in combination with the lack of critical mass.

Off course, first critical mass is needed to upgrade the surroundings and realise the envisioned improvements in public space, so liveability should partially grow organically. Nevertheless, the perception of safety in terms of lighting; improved connectivity in terms of bike tracks and sidewalks; but also public amenities as restaurants and coffee shops are important and could directly influence the attractiveness of the area.

Because M4H reflects an incremental redevelopment project, streets and roads are still used by lorries that provide logistics services for the fruit and juice handling companies in the area. Noise, pollution, and heavy road use are detrimental to the district's walkability, and a lack of substantial green space can damage the appeal and quality of place (Peek, October 2016). The port layout and functions in combination with the former power plant hinder the availability of substantial green open spaces. Therefore, the Merwe-Vierhavens, still categorized as industrial area, might appear as unattractive, unsafe, and unwelcoming (photo 7.3). Much remains to be done when it comes to its spatial quality. The area can use more qualitative public spaces, slow traffic routes, improved social safety, and a further mixed-use program. However the area is situated well connected with the city-centres of Schiedam and Rotterdam and well accessible by car and public transport.



*Photo 7.3 Design challenges: creating slow traffic routes.*

‘Although plans for M4H aspire to bring forward a range of small ‘maker’ companies and workspaces, the site lacks amenities and public environments to generate the buzz and the stickiness needed for real interaction. Nevertheless the Merwe-Vierhavens and RDM set a scenery of industrial elements as docks, wharfs and terminals’(Peek, October 2016). Some of significant historic value as the Rotterdam Dry Dock Company and others praised for its architecture. This is viewed as an important asset to be protected and preserved both by the innovators as the CityPorts team. The historical identity is defined by the recognisability of the port landscape (Programmabureau Stadshavens Rotterdam, 2015).

Diverse  
urban  
setting

***‘Where industrial buildings have been redeveloped or refurbished into innovation-friendly spaces, this work has been done with an eye on maintaining the buildings’ intrinsic raw and unpolished characteristics.’ (Peek, October 2016)***

As Peek (2016) stresses in his study ‘the innovation asset base in Rotterdam is currently very dispersed, and cannot benefit from organic and spontaneous collaboration because of the large distances and physical barriers of water. Accordingly, the basics of a supportive physical environment, referring to 1) proximity, 2) diversity, 3) density, 4) urbanity, 5) compact building blocks, and 5) balancing old and new architecture the area is in need for multiple improvements, can be improved and refined in Rotterdam. However, the strong physical assets in place are reflected in 1) its port identity, 2) the connectivity and proximity to the city-centre, 3) and the availability of place.

Urban area  
level

When assessing the quality of life on the urban area level it must be acknowledged that the Merwe-Vierhavens is surrounded by Delfshaven comprising the neighbourhoods of Delfshaven, Bospolder, Tussendijken, Spangen, Nieuwe Westen, Middelland, Oud-Mathenesse, Witte Dorp, and Schiemond. In comparison to the Rotterdam City centre these areas are valued less positive when it comes to the sense of safety; the living experience, valuation of amenities and public space; and the level of social interactions (figure 7.17).



Figure 7.17 District profile Delfshaven on the left-City Centre on the right. (Gemeente Rotterdam, 2016)

In addition, the valuation of a high quality of green public space and a pleasant living environment in relation to the overall valuation for Rotterdam and the region shows also a less positive outcome for the direct urban area in which the Merwe-Vierhavens are situated (figure 7.20).

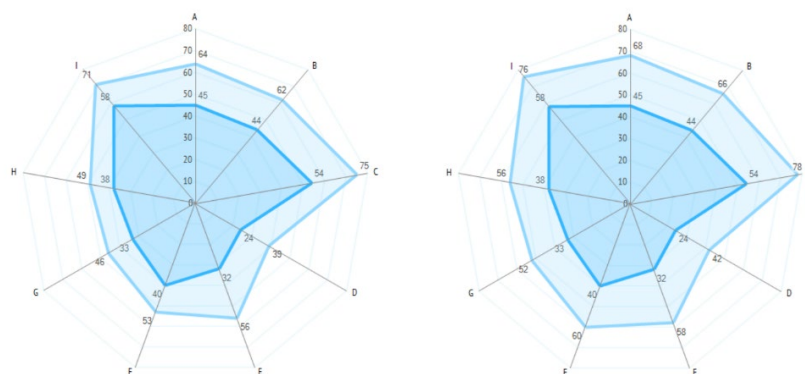


Figure 7.18 Valuation quality of green and living environment of Delfshaven in comparison to the City (left) and the region (right). (Rotterdam Rijnmond in cijfers, 2012)

This can be explained due to the fact that between 1980 and 2000 a flow of migration caused the area comprising Delfshaven to transform in a deprived area knowing high unemployment rates of which the district is still recovering. The areas still faces social metropolitan concerns. In line with this urban area profile, the redevelopment of the Merwe-Vierhavens should address a wider strategy for urban growth, liveability, and competitiveness.

Complementary to these finding the following chapter will explore localisation behaviour of the present innovators in the Merwe-Vierhavens in combination with insights into desired spatial conditions.

### 7.4.3 The innovator perspective: essential spatial conditions

To achieve future-proof employment opportunities and make the transition towards the next economy Rotterdam has to find new ways to attract and retain high income households. Some say this can be done by focussing investment on providing an attractive living and working environment as labour appears to follow human capital. The area has to be attractive and vibrant like Katendrecht where unmarketable building were transformed into public facilities. In line with that, building a community is one of the important strategies in marketing the Innovation District to stimulate open innovation and accordingly knowledge spillovers. These areas are not only about accommodating companies promoted by its high innovative output. It's about companies, organisations and individuals finding each other, creating cross-overs, leading to new or better ideas, services, and products.

*'When composing this framework and defining development targets in realizing the innovation district 'be careful with defining innovation and appointing certain companies and activities as not innovative enough'. (Schellekens, 2017)*

Because innovation is not only about radical inventions but also about modernizing and optimizing processes and products that sometimes results in economic value-creation and in some cases is of great value to society producing social value creation. In addition, 'to get this redevelopment going it is important to compile an inventory of what is already there. This sometimes gets forgotten, and buried under the need to start over and come up with something new.' When this inventory is complete testing its quality and assessing its potential for growth – it *doability* can be helpful to further development and expand what is already there (Balkema, 2017).

*'Companies follow smart people; smart people want to live and work in a nice place.'*  
(Schmitt, 2017)

A shift in location preferences – that used to be based on a classical rationale and now moves towards a more behavioural and evolutionary understanding on long-standing, external, and 'soft' factors to adapt to change, becomes apparent in practice. Companies, especially frontrunners, want to locate in proximity of talent and expertise. Talent can be found near knowledge institutions and is related to the quality of life and attractivity of place. These soft localisation characteristics as work ethic, visual attractiveness and representativeness, also attract human capital holding practical experiences, expertise, and knowledge. As we are shifting towards a knowledge-intensive economy these 'soft' location factors become more important in comparison to the more traditional factors as cost reduction and revenue optimization. When companies are seeking talent and expertise they need to be located there where talent and expertise comes together to enhance its organisational performance. In response, companies are moving their headquarters to vibrant popular cities like Amsterdam in which accommodation and location becomes a brand in itself.

In the case of the Rotterdam Innovation District companies are targeted on their (inter)national innovative capacity. These companies can be sensitive for:

- the hard location factors as cost reduction due to low rents;
- softs factors as the brand Innovation District;
- the attractiveness of the industrial heritage and maritime scenery;
- institutional support in legislation and room for experimentation;
- or due to proximity advantages through co-location.

Decisive  
localisation  
behaviour



*‘Especially the companies that choose their location in the interest of adaptation to change are seeking locations that not only answer to their primary needs but are in favour of environments that inspire.’ (Schmitt, 2017)*

Because, an attractive and inspiring environment influences the networks operating in it that accordingly determines the potential for actual crossovers. Many localisation advantages briefly noted – availability of space, institutional support, and closeness of knowledge institutions and human capital in the region, are available or provide potential for refinement within the Rotterdam Innovation District. Especially on the urban area level and the building level the Merwe-Vierhavens is well-endowed and able to spur innovation. However, on the urban district level, some important aspect representing the very essence of the concept innovation district are lacking in terms of density, urbanity, and diversity.

*‘An important trade-off for companies to locate in the area may be; will this location and environment please my personnel?’ (Schellekens, 2017)*

From the innovator perspective many companies located in the Merwe-Vierhavens are in favour of residential developments to boost the liveliness of the area, as does the municipality. At the moment most of the area is dominated by offices and logistics which create an unpleasant environment outside working hours.

Vibrancy and community sense can be enhanced by public facilities creating a constant flow of people. Besides, public amenities in combination with placemaking can attract visitors that positively alter dynamics, as a catalyst for further development by creating critical mass. This is needed to create public support for realising the envisioned improvements in public space. Therefore liveability should partially grow organically.

When it comes to returning notions on desired physical interventions the area can benefit from a physical connection between the dakpark and the Merwe-Vierhavens to connect the areas with its surroundings; an upgrade of Marconiplein as important representation of the area due to its entrance function; and interventions that raise sense of safety, community, pride, attractiveness, and brings visitors to the area. From the innovator perspective the entrance of the area and water connections are a must to create attractiveness and enhance connectivity. Especially with RDM as the Innovation District is promoted as one.

*‘The Merwe-Vierhavens could use more mixed-use, supportive public facilities and vibrant nice places. This provides lots of potential which is not fully exploited yet.’ (Lamers, 2017)*

To become more than a branding initiative a catalyst development can be sought in public facilities in combination with attractive outdoor spaces. It may seem that the innovation district is mainly focusing on attracting and accommodating new innovation-rich activities. However to nurture what is already there a mix of commercial and residential use, including affordable housing, as well as space for retail, hospitality and community uses may help create a more innovation-rich environment as well (Peek G. S., October 2016). Besides, waiting for critical mass – to be realized through bottom-up and private sector-led developments, before improving the quality of space (caused by the shortage in public funding) may slow down the redevelopment project. It must be acknowledged that an improved urban and vibrant setting can help to accelerate the redevelopment which no dot always have to imply create financial costs. Through strategic planning on placemaking and temporary use; on quality trade-offs concerning interventions in public space or physical district branding; or by facilitating bottom-up initiatives or allowing private-led developments, costs can be mitigated, shared, or transferred to the market.

From this exploration can be learned that besides the need for getting the basics straight – in terms of a diverse and vibrant urban setting to attract the right target group and retain accommodated innovators, the area is in need for spatial conditions that support open innovation and accordingly community building on the urban district level, to transform this proximity cluster into an actual innovation district. In this context the built environment should be planned more strategically to influence the possibilities for people to meet and share ideas (e.g. proximity, community sense, urbanity, accessibility); create opportunities for shared public space (e.g. accessibility, availability). In this way the urban district become a facilitator of knowledge spillovers in which the built environment not only accommodates companies promoted for its high innovative output but actually provides an environment in which companies, organisations and individuals find each other and create crossovers that lead to new or better ideas, services, and products.

## 7.5 CASE FINDINGS & CONCLUSIONS

In this chapter the Rotterdam Innovation District is explored to build knowledge on innovation district development in Dutch practice. Accordingly, this exploratory case analysis has led to several findings which are presented here. To structure these findings the following questions were answered throughout this chapter:

- What development dynamics underlie the innovation district proposition?
- Which planning approach is applied in the urban development project and what roles are deployed by the local public authority in the development of the innovation district project?
- Which planning approach and what roles should be taken by the local public authority in the development of the innovation district to activate the project?
- What spatial interventions are initiated by local public authorities to stimulate innovation, what spatial conditions are already in place and what conditions and interventions are desired by the actual innovators present in the innovation district on the urban district level?

By answering these questions this exploration has led to an understanding on the roles the built environment and local public authorities have and can have in stimulating innovation at the urban district level.

### The Innovation District initiative

An understanding on the innovation district initiative was gained by exploring the development context in which the project takes place. From this exploration can be learned that multiple planning and development challenges have shaped and altered the redevelopment project of the Merwe-Vierhavens. To date these challenges hamper the project, because port authority and municipality have to rethink their commitment. For the Merwe-Vierhavens difficulties in jointly redeveloping the area is caused by 1) the strategic value of the location to both stakeholders; 2) the multiple interlocked development challenges and its financial implications; 3) the complexity of the project and the large scale counting for 140 hectares; 4) and the formal role division between port and municipality on redeveloping this part of the CityPorts project on the North side of the Meuse.

Difficulties lie in dealing with the still present port activities in relation to the envisioned urban developments in the Merwe-Vierhavens. The continuing port (related) activities pose environmental contours and hamper accessibility, making urban development less opportune and difficult. When these activities leave, great uncertainties in soil quality demand major investments for sanitation which makes it difficult to realize a feasible project. The redevelopment of the Merwe-Vierhavens entails a complex project due to the different land positions of port authority and municipality in combination with multiple private actors with their own objectives to vouch for.

Secondly, in terms of organisation, the CityPorts project has known multiple development strategies and several organisational arrangements between the port authority and the municipality over the last 15 years. Within this alliance development objectives have shifted driven by several incidents. This, in combination with current challenges (figure 7.5) creates hick-ups throughout the overall execution of the CityPorts project and has resulted in the ongoing exchange of views to decide on role-taking and the allocation of means, by both municipality as port authority in the Merwe-Vierhavens redevelopment.

To add to that, collaborative planning became difficult due to the limited responsibilities and jurisdictions of the project organisation towards the CityPorts area and the Merwe-Vierhavens project. Besides that, the altering development dynamics within the CityPorts project effect trust between both parties. The negotiations on the formal agreements concerning the Port-City collaboration directly influence the positions taken by both actors in the redevelopment of the Merwe-Vierhavens and delays the realisation of the Innovation District. Because, while the municipality is guarding the interests of the city at the North bank of the Meuse they do not have the resources to accelerate the project. The port authority, on the other hand, can act as private actor, but is not entitled to take a developer/investor role in urban development projects as their core business is managing the port. Besides that, the port authority faces major uncertainties posed by the energy transition and investment inquiries are analysed more carefully on possible financial risks. In this view, it becomes difficult for the port authority to bring in venture capital to activate the innovation district project. In addition, with the corporatization of the port authority and its development-led port land policies financial returns of investments are of great importance to the projects the port authority is partaking in.

In this view, creating commitment to the innovation district concept; accelerating investments and developments to redevelop the Merwe-Vierhavens; and taking an entrepreneurial and risk-taking attitude to react as a flexible and decisive organisation in realizing the project, becomes difficult for both entities. This, in combination with the emphasise on urban developments, makes the realisation of the Rotterdam Innovation District highly dependent on private sector involvement.

It must be stressed that common ground within the CityPorts alliance for redeveloping the Merwe-Vierhavens, has been lacking and common development objectives were less obvious in comparison to the rest of the CityPorts project. The municipality was focussing on the realisation of residential developments and the port authority was still acquiring port related activities. Despite the fact that the Merwe-Vierhavens were planned to be transferred back to the city. This proceeded extremely slowly as some contracts of port related activities were running for at least fifty more years. Besides, there was no evident market-push. In addition, an accelerated division of estates in which the acquire – the municipality, had no sufficient investment capacity to actual redevelop the area, would also not benefit the ambitions for urban developments in the short term. Balancing port and city development objectives, while guarding trust and commitment within the long-term contractual relationship between port and city, was very difficult. By the end of 2015 this partnership was endangered and an answer to rethink their collaboration in line with finding common ground on accelerating the Merwe-Vierhavens project was found in the concept of the innovation district.

### **Building commitment & public support**

The innovation district concept was initiated bottom-up within the City administration. It took quite some time to incorporate the concept in both organisations and build public support and commitment. The initiative for launching the Rotterdam Innovation District was mainly explored by a small committee resulting in the lack of sufficient support from both mother organisations. After branding the initiative the project team M4H had to bring the innovation district proposition further in both organisations. Finding public support for the Innovation District project was reached by addressing the ways in which the concept can accelerate the redevelopment of the Merwe-Vierhavens and benefit the city, the port and the greater region. Nevertheless, as the plans do not entail a fixed masterplan, port authority and municipality are still devising the formal agreement of collaboration to bring the Innovation District into realisation. Besides, the major changes in personnel and the departure of the programme director Stadshavens, also not helped to follow up the branding initiative with a plan for activation. The project is lacking a public driver that promotes the envisioned district which could help building commitment or accelerate developments.

### **Focussing on the end-users**

Despite the dependency on the private sector to realise urban developments, investors and developers are not directly targeted in redeveloping the Merwe-Vierhavens. Since 'Pionieren aan de Maas' (2009) Stadshavens has been targeting specific end-users by means of strategic planning. It is acknowledged that redeveloping the Merwe-Vierhavens from an unsafe 'no-go' area to a lively attractive living environment takes time and is costly due to the challenges posed by environmental contours, its connectivity to the city and its reputation as industrial site. Therefore, pioneers and early adaptors are fostered for their role as incubator. They can influence the redevelopment process by enabling a shift in identity. They can attract people when refurbishing unproductive warehouses into vibrant offices, ateliers and shared work spaces. Despite the fact that several iconic end-users are utilized as 'area ambassadors', not all promoted end-users are feeling consistently involved in the planning process for redeveloping the Merwe-Vierhavens and bringing the Innovation District closer to realisation. Others see in municipality and port authority a more traditional role as landlord, as both actors exploit land and real estate in the Merwe-Vierhavens. In this respect both Stadshavens as the actual innovators, seem to believe in a laissez-faire approach towards the Innovation District project. Assuming that the capacity to innovate rest with market-industry interactions, in which Stadshavens is seen more as an enabler of these interactions.

### **The incremental development approach**

Focusing on the end-users can be explained by the fact that the municipality of Rotterdam is no longer in a position to initiate large-scale redevelopment projects as presented in earlier planning documents. Municipality and port authority have taken a supporting and facilitating role to anticipate on concrete market initiatives. Investments were pushed forward due to the lack of critical mass and market demand. In this context, Stadshavens obtained a re-active incremental development approach depending largely on bottom-up initiatives. Instead of attracting investors and developers to gradually transform the area into an mixed-use urban environment. This resulted in an adaptable development path based on multiple scenario's. This approach provided a flexible framework to incorporate new initiatives under a more regulatory role deployed by both entities. In this way the risks and uncertainties posed in the first phase of the redevelopment to change the image, associated with its former industrial functioning, were postponed.

### **Stimulating innovation through the built environment**

When analysing to what extent the built environment is already stimulating innovation, much can be improved despite the potential for which the area is promoted. To date, the area still very much functions as an industrial area, gradually transforming and urbanizing due to the presence of the promoted pioneers and early adapters, together with industrial functions that are moving out. However the lack of density, urbanity, and diversity makes that we cannot speak of a diverse urban setting yet.

The innovation district very much relies on the strong identity of place in combination with its connectivity and availability of inspiring working environment, due the relation with the water and former industrial warehouses. The physical assets on the area and building level set the image of a high potential area in favour of stimulating innovation. Nevertheless, on the urban district level we can rather speak of a strong proximity cluster, concerning the innovators promoted in the Rotterdam Innovation District. There is a lack of continuing and systematic interactions between companies located in the area and open innovation is mainly reflected in the companies clustering at RDM at the innovation dock and in the Merwe-Vierhavens in the Rotterdam Science Tower. In addition, occasional formal interactions reflect the presence of many individual innovators. Collaborations and interactions that not exceed the building level often, can be explained through the lack of a central meeting point within the district and the lack of urban facilities that provide the opportunity to meet occasionally.

It was believed by Stadshavens that the area must first transform more organically to create critical mass, before investments in public space and infrastructural improvements were made. With the innovation district proposition in favour of accelerating the innovation district this changed. The implementation strategy envisions multiple interventions on the district level concerning infrastructure and public space. The spatial conditions envisioned are in favour of enhancing the economic synergy between RDM and M4H, concerning infrastructural and public space improvements that demand large investments. As the redevelopment of the Rotterdam Innovation District has been relying on bottom-up initiatives it can be questioned if the desired spatial conditions are too ambitious and if improvements will actually follow. In addition, for now the spatial framework is too broad and a renewed zoning plan enabling a 24H culture is missing. This makes it difficult to tempt either the private sector to co-invest in public and urban amenities or create planning gain for private actors to contribute to the redistribution of collective benefits. The project is in need for basic principles on mixing residential developments with still present industrial activities to create effective planning tools related to zoning, legislation and contracts, that can help realise the innovation district ambition.

### **Mitigating the risk of neglect**

With the launch of the Rotterdam Innovation District the Merwe-Vierhavens is in search for embodying the promoted avenue for growth – smart manufacturing, as the area lacks an anchor facility like a university, hospital, or company that can boost the development and attract new companies, knowledge institutions and entrepreneurs. The district is defined as the testing ground and display window for new technologies, as a reflection of the next economy in which production, prototyping, and manufacturing flows back into the city and becomes driven by technological possibilities and smart techniques. Accordingly, knowledge-intensive and innovation-rich activities related to smart manufacturing are targeted. However a proper understanding on their location preferences is still missing, especially on the urban district level. Spatial conditions defined to serve the envisioned end-users are 1) urban amenities to complement functionality of location; 2) experimental space to design, prototype and showcase inventions; 3) and flexible and affordable spaces. These spatial conditions focus mainly on the availability of space in relation to flexibility and adaptability.

### **Activating the Innovation District**

Creative entrepreneurs, and in the context of the Innovation District proposition – the innovators, have the power to accelerate the change of identity and can enable an inspiring and attractive environment. However, this reflects a rather slow and gradual transformation process based on small impulses mainly concerning image improvement on a building level rather than actual developments and physical large-scale urban renewal. As much needs to be done to realize a vibrant innovation district, the redevelopment of the Merwe-Vierhavens has to be accelerated. To bring the Innovation District project into realisation a more pro-active approach is desired and also to be expected of Stadshavens to activate the Innovation District. The launch of the Rotterdam Innovation district has linked RDM and the Merwe-Vierhavens in an economic proposition and implies an accelerated development of both areas. As RDM already entered a more maintenance phase, the Merwe-Vierhavens forms the main challenge in terms of urban regeneration and delivering on the objective for being an important and refined component of the Rotterdam innovation ecosystem.

From theory we have learned that when initiating an innovation district, a visionary role driven by ‘out-of-the-box’ thinking and unconventional strategies are needed to build public support and accordingly bring the project into development. In the case of the Rotterdam Innovation District this has taken quite some time. To date this has resulted in a refinement of the current development strategy to fit the innovation district ambition. Subsequently a deviation from the current scenario principles was essential, in combination with more specific ambitions and project definitions for the different sub-areas. Accordingly, before pro-actively allocating ‘hard’ management resources (e.g. land, real estate, and capital) the formal arrangements have to be in place.

### **Role-taking**

Within the Stadshavens alliance and in relation the Innovation District development the municipality holds multiple role ranging from shaping and regulating the built environment to facilitate and stimulate economic development. However, to realise projects like the Rotterdam Innovation District, this more facilitating role is desired by the end-users present in the Merwe-Vierhavens, to shift towards a governing role in which policymaking is followed by actual interventions. The municipality has the opportunity to adopt a more active role in facilitating the processes leading to innovation in which a pleasant working and living environment is created. To secure these more socio-economic and spatial ambitions within the project the municipality must become a compatible interlocutor towards the port authority and the market, and bring in the right competencies and expertise in time. Besides that, port authority and municipality do not have to keep studying on realizing the innovation district all by themselves. When opening up to new partnerships or by joining forces with the promoted end-users known for their entrepreneurial attitude, creative thinking can be found with the private sector. However, this demands transparency and structural and consistent interactions and discussions to build more strategic partnerships in which common goals are set for a certain period of time. When such commitment is not desired by either port authority or municipality it should at least be clear on which basis knowledge and information is exchanged.

### **A pro-active development approach**

Today, a more pro-active development approach is reflected in small scale projects shifting from planning for the innovation district to the actual development. In this shift real estate objects are gradually acquired and activated by the port authority; events are showcasing the smart manufacturing cluster present in the area; and expertise is gathered from both port authority as municipality to finalize and operationalize the innovation district ambitions.

However, an entrepreneurial and risk-taking attitude is needed (supported by both mother organisations!!) to realise the pronounced ambitions. In this way local public authorities become able to react as a flexible and decisive organisation in realizing the project and can make actual pre-investments to bring the project into a new development phase. This pro-active development approach to be taken by both port authority and municipality, should at least provide leadership vision translated into clear development plans in which land, real estate and capital is deployed and 'soft' management measures are used more strategically in favour of stimulating innovation and the processes leading to it (e.g. planning instruments and expertise); in which the project organisation is open to entrepreneurial partnerships or private sector involvement (ranging from sharing knowledge and expertise to actual developments) to activate the innovation district development.

### **Waiting for a catalysing development**

Commitment to the innovation district project and an accelerated redevelopment of the Merwe-Vierhavens is still sought in a refined agreement of collaboration between port and municipality, while the accommodation and implementation strategy of the innovation district project is being refined. Accordingly, the project still undergoes certain difficulties that can hamper the acceleration of the redevelopment project, but also makes commitment of both stakeholders more difficult. Despite the fact that major land lease contracts are ending; port activities will leave the area or industrial functions have already left; and market demand is growing, a catalyst development has not yet followed the launch of the Innovation District.

A catalyst development has not followed yet, because it must be acknowledged that the process to structure the organisation of the Rotterdam Innovation District is taking quite some time. Current projects are not publicly communicated yet and investments in public space and infrastructural improvements are still pending. This may not affect the redevelopment of the Merwe-Vierhavens on the long term. Nor does it have direct negative effects on the innovators for which the area is promoted. However, municipality and port authority have to question themselves how unfortunate it is to them, when momentum created, falls to the ground and Stadshavens cannot live up to the ambition of accelerating developments and attract or accommodate the envisioned activities. In this way the promoted deviation from the industrial image of the area towards a vibrant city district, where port and city meet, will be lost at least on the short term. This can also raise questions by the general public on the innovation district propositions in relation the reality. To put this into perspective, it can be questioned to what extent the process of redefining a more effective collaboration agreement, will endanger the innovation district ambition in relation to the redevelopment project. This does not only concerns the risk of losing momentum but also reflects the uncertainty of the development objectives to be placed first and ultimately influence to what extent the project will bring forth an innovation-rich development or end up as a fantasy in favour of speeding-up urban regeneration through new economic activities.





# **PART 4**

## **CONCLUSIONS & RECOMMENDATIONS**

# CHAPTER 8

## *Conclusions & Recommendations*

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### 8.1 INTRODUCTION

The previous chapters provided a theoretical exploration on innovation district development in combination with an empirical case study on the Rotterdam Innovation District development. This chapter will provide conclusions by combining findings from theory with the patterns observed in the case analysed. In this way an understanding is built on how the built environment in relation to the roles to be deployed by local public authorities can stimulate innovation. This analysis is therefore mainly descriptive of nature, building on the knowledge retrieved through this exploratory research approach.

During this research several concepts related to innovation district development and stimulating innovation through the built environment were explored and tested on a case in Dutch urban practice. This helped to construct an answer on the main research question of this research: How can local public authorities plan for and subsequently develop innovation districts that deliver on the objective of stimulating innovation through the built environment?

This chapter aims to provide an understanding on effective planning approaches to be deployed by local public authorities in innovation district development (how to develop) and on the spatial conditions that are able to stimulate innovation and the processes leading to it (what to develop).

In the theoretical exploration two main conceptual models were constructed on the spatial conditions that can stimulate innovation and the roles deployed by local public authorities in innovation district planning and development (figure 4.11 & 5.7). Subsequently these models were used to test theory on the case of the Rotterdam Innovation District (figure 7.11 & 7.12). Allowing an evaluation and refinement on the theory build throughout this graduation exercise by means of the following synthesis.

Therefore this chapter will provide an understanding of:

- *The spatial conditions that stimulate innovation in innovation district developments*
- *The roles local public authorities can take to effectively plan and develop for an innovation district that is able to spur innovation through the built environment*

## 8.2 STIMULATING INNOVATION THROUGH THE BUILT ENVIRONMENT

### **No blueprints on 'optimal' urban form**

This research has tried to define the physicality of innovation and the processes leading to it on the urban district level. In this way the roles the built environment can play in stimulating innovation are explored, especially in innovation districts. In theory innovation districts are promoted for the ways they intent to facilitate knowledge spillovers; attract human capital; and facilitate idea generation, knowledge creation, application and accordingly the commercialization into inventions and innovations. These districts envision a high quality of life. Integrating work, living, and leisure through a diverse urban setting close to or within the vibrant daily urban systems of the city. Besides, in these environments collaborations and interactions between knowledge institutions, public authorities, the private sector and civic society, are enhanced to overcome organisational or sectorial limits. These interactions and collaborations are stimulated through the multiple possibilities to meet and allowing crossovers to happen – referred to as the process of open innovation.

In practice, urban development projects get labelled as innovation district without meeting the previous definition. As the concept of innovation districts became utilised as rebranding strategy, not all physical prerequisites to facilitate and stimulate open innovation are in place. However, it must be acknowledged that there is not one clear blueprint for an 'optimal' integration of innovation and space. Innovation districts are highly context-specific and shaped by its distinct urban fabric in combination with the preferred location factors of the envisioned end-users.

In the Rotterdam Innovation District, much needs to be done to transform this rather traditional innovation cluster into an environment in which companies, organisations and individuals find each other and create crossovers that lead to new or better ideas, services, and products. For Rotterdam, the physical assets on the area level and building level set the image of a high potential area in favour of stimulating innovation. On the urban district level, however, there is a lack of density, urbanity and diversity. This makes the project in need for spatial conditions and physical interventions that support open innovation and accordingly helps building a community in favour of open innovation on the urban district level. Empirical findings on the case study show that the theoretical assumption on the benefits of spatial concentration to create knowledge spillovers are acknowledged. Besides, actors are well aware of the agglomeration advantages on the area level. However, answering the question how to organize and facilitate a sense of belonging and the capacity to collaborate, which is essential to absorb knowledge spillovers and make use of geographical closeness, is challenging. Because, especially for top-down initiated innovation districts like the one in Rotterdam, an understanding on what the actual innovators need and do to innovate is in need for refinement.

### **The role of the built environment**

Before being able to define the actual contribution of location decisions and spatial interventions in stimulating innovation, the perception and valuation of innovation by multiple stakeholders is important to determine. This goes beyond the availability of space and the presence of urban facilities to accommodate innovation-rich activities and attract visitors. Because, the processes leading to innovation are equally important and rely on attracting and retaining high-skilled people.

Human capital is essential for knowledge creation and application. But the processes leading to innovation also rely on the ability to support the collaborative processes that may spur innovation. In this view, the built environment can also provide spatial conditions enabling the processes leading to innovation. Accordingly, the built environment becomes a valuable resource of strategic use to realise development objectives as raising the innovation profile from building level up till the urban area level (figure 8.1).

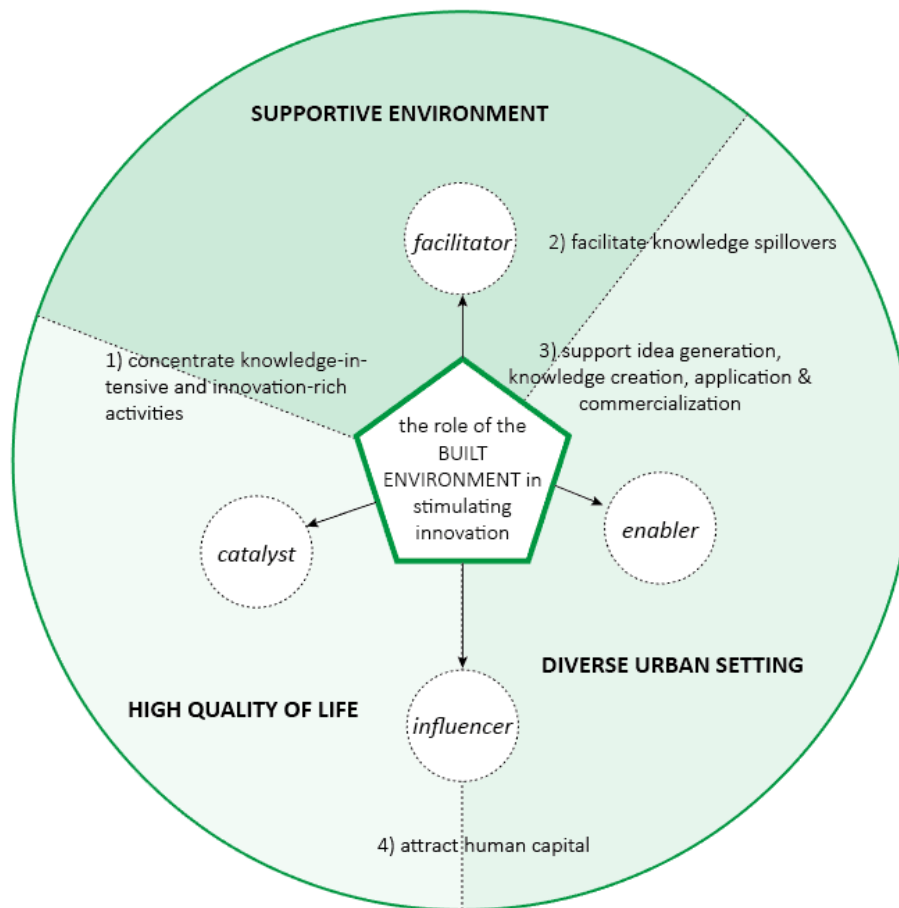


Figure 8.1 The role of the Built Environment in stimulating innovation

When conceptualizing the spatial conditions, based on notions from theory and empirical findings, the built environment has the potential to stimulate innovation directly. In this way the built environment becomes a facilitator accommodating knowledge-intensive and innovation-rich activities through spatial concentration, flexibility and adaptability of urban form and the availability of place. But innovation can also be stimulated more indirectly, enabling the processes of knowledge creation, diffusion, application, and commercialization. In this respect the built environment becomes:

- a catalyst to attract human capital through a high quality of life shaped by the attractiveness of place, identity, authenticity, and district branding;
- an influencer of the density of social interactions leading to face-to-face contact and the processes that spur innovation through the provision of a diverse urban setting defined by its diversity, density and level of urbanity and vibrancy;
- and an enabler of knowledge spillovers that take place through the advantages of proximity within these spatial concentrations allowing the processes leading to innovation within a supportive environment allowing and stimulating open innovation through accessibility, connectivity, and community sense.

The more specific definition of a high quality of life (figure 4.11), a diverse urban setting (figure 4.10), and a supportive environment (figure 4.12) is shaped by what the actual innovators need and do to innovate in combination with the location preferences of the residents and visitors expected and targeted with the redevelopment of the district.

From localisation behaviour, observed during the case analysis and found in theory, location preferences of companies and individuals can be driven by hard and soft factors. These location factors range from cost reduction asking for affordable spaces and cluster potential in favour of co-location to the importance of image and attractiveness of place (table 6.2). In line with theory, location preferences in the case analysed are dominated by the growing trend to favour urban living in which people are choosing to work and live in urbanized environments close to or within the city. In addition, companies in favour of open innovation and seeking for knowledge spillovers, are in search for inspiring locations where they can attract and retain high-skilled people. Besides, companies and individuals seem not only attracted through financial incentives. However, the perception of a good and supportive environment can reflect different location preferences, influenced by subjective localisation decision-making, financial drivers and the importance of the social and institutional context. Meaning that companies and individuals find added value of place for distinct reasons. In addition, innovation can either be incremental or radical and the processes leading to it be of individualistic or collaborative nature. Besides, innovation can be more creative, technical or 'process-organisation' orientated, referring to the differences between alphas, gammas and betas and demanding different spatial conditions. Innovation district initiators therefore have to search for the common denominator in terms of physical interventions related to program, public space and infrastructure (e.g. urban facilities, parks, bike routes).

### **Strategic planning**

By combining theoretical findings with lessons derived from the case study, an understanding on effective spatial conditions able to spur innovation can be defined. As previously explained, the built environment can stimulate innovation at the urban district level when deployed as catalyst, influencer, facilitator, and enabler. Based on the theoretical assumption that the added value of the built environment can be understood as the combined effect of interdependent strategies that have the potential to stimulate innovation (Curvelo Magdaniel, 2016). Because, when focussing on stimulating innovation, strategies that influence the processes leading to innovation – reflected in accommodation strategies, spatial frameworks and zoning plans, are important as well to facilitate and stimulate the processes leading to innovation.

In this way urban strategies can be used to steer the development of an environment in which work, living, and leisure is integrated and face-to-face contact is stimulated through multiple possibilities to meet and allow crossovers. From the case analysis on the Rotterdam Innovation District can be learned that strategy is built on 1) attracting and retaining the envisioned end-users – reflected in acquisition & accommodation strategies; 2) developing a stimulating and enabling environment – reflected in spatial plans; 3) and envisioning and organizing innovation and the processes leading to it – reflected in partnership agreements, informal collaborations, and collective actions.

To deploy the built environment in favour of stimulating innovation these strategies should incorporate decisions on the following spatial conditions:

- Location decisions on the availability, flexibility and adaptability of space to accommodate and facilitate knowledge-intensive and innovation-rich activities;
- Location decisions on supporting image and district identity to attract visitors and the envisioned end-users (e.g. companies, knowledge institutions and residents).

- Location decisions on program (e.g. type of neighbourhood supporting and public facilities) to enable amenities that increase the diversity of people and enhances the density of social interactions.
- Location decisions on urban lay-out (e.g. density and diversity), and public space (e.g. attractiveness, accessibility, and connectivity) to create vibrancy and community sense.
- Location decisions on physical nodes (e.g. meeting points, shared and flexible workspaces) to enable knowledge spillovers that take place through the advantages of proximity.

These decisions, can lead to interventions that have the ability to stimulate innovation through the built environment. Accordingly, to connect the role of the built environment to these location decisions and translate them into physical interventions, the following information map, based on the findings of this exploration research, is constructed (figure 8.2).

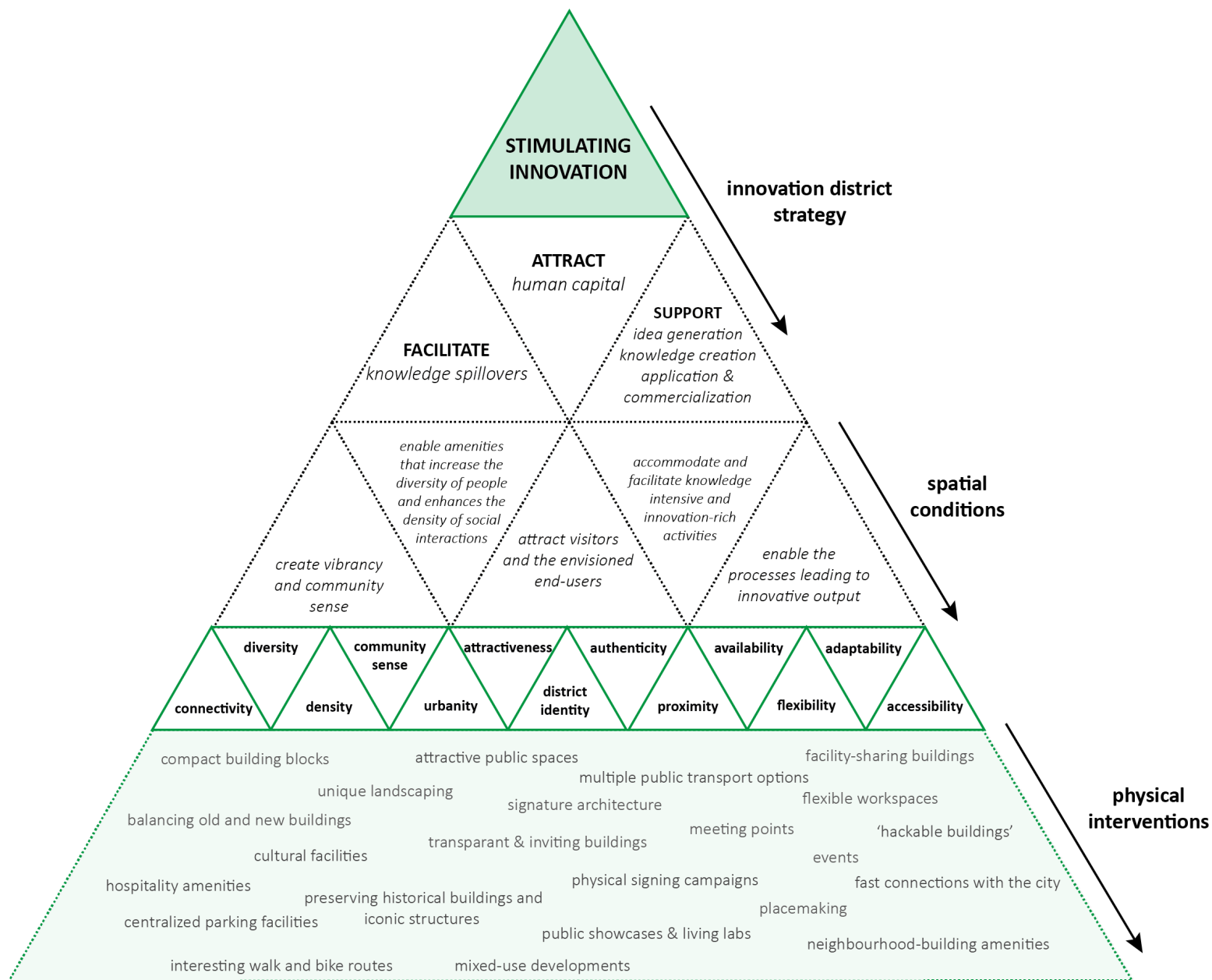


Figure 8.2 Information map: from innovation district strategy towards physical interventions

Accordingly, based on the overall exploration on the role of the built environment in innovation district developments the following answer is constructed on the question: What spatial conditions and physical interventions help develop an innovation district that stimulates (the processes leading to) innovation?

*A diverse urban setting comprising a sense of community, well connected to the city, with a strong inspiring identity, open and mixed in use from building to area level.<sup>16</sup>*

**Diverse urban setting;** refers to innovation districts as reflection of the city to be dense, diverse, compact, and urbanized. This is essential to make interactions easier, cheaper, and more effective. Besides, it supports social interactions by providing multiple opportunities for formal or informal; intended or accidental; and planned or coincidental interactions. In theory, a diverse urban setting is promoted through hospitality and cultural amenities and mixed-uses. The Rotterdam Innovation District is therefore in need for not only more public facilities and neighbourhood amenities but also open to mix working-living-leisure to pivot from industrial closed-in area towards an open urbanized mixed-use area. These conditions are important because they all reflect the physical environment in which innovation and the processes leading to it are facilitated by activities that are necessary, optional, or social – in favour of knowledge creation and diffusion.

**Sense of community;** a constant flow of people is needed to provide a sense of safety to accordingly build a sense of community and trust. Building a community on the urban district level becomes essential to transform an area into an actual innovation district able to spur innovation. Because, like with the Rotterdam Innovation District these areas can be promoted for their knowledge-intensive activities already present despite their lack of actual knowledge spillovers. Looking closer, these districts may reflect proximity clusters or innovation-rich networks lacking local production networks or sufficient spatial linkage, although companies within the cluster seem relatively close. This can ultimately make present activities more footloose which may endanger the innovation district development. The Rotterdam Innovation District can improve its sense of community through an improved quality of public space in combination with walk and bike routes, enabling placemaking and create public recreational waterfronts and a central public meeting point. In this way the density of social interactions leading to face-to-face contact can be enlarged allowing people to meet.

**Well-connected to the city;** as not every innovation district entails a diverse urban setting from the start – aimed to grow organically when reaching critical mass for urban amenities, it is important that these district are well-connected to the city where vibrant daily urban systems do provide a wide range of agglomeration advantages. The Rotterdam Innovation District is well connected with the city-centres of Schiedam and Rotterdam and accessible by car and public transport, over land and water. However, the connection over water by water taxi is rather expensive and therefore not approachable by everyone. The main point for improvement in time will be a connection between RDM and M4H. This may help to enhance knowledge spillovers between the activities on the north and south side of the Meuse.

**Strong inspiring identity;** in order to attract and retain not only entrepreneurs but also creative entrepreneurs – seen as a driving force behind innovation, an innovation district must provide inspiring (cultural) facilities like museum, street art, restaurants, bars and pop-up events to stimulate innovative thinking and knowledge spill-overs.

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<sup>16</sup> This definition is based on returning notions in theory and findings derived from the case analysis on desired spatial conditions and thereto related physical interventions. Explored more in depth in chapter 4 and underpinned with findings presented in chapter 7.4.

For the Rotterdam Innovation District this is reached through the presence of monumental industrial heritage and port structures in combination with the relation to the river and refurbished warehouses. In this respect identity is not only reflected in functionality but also in authenticity of place through monumental architecture, urban, and unique landscapes.

**Open and mixed in use from building to area level;** the changing geography of innovation – from closed to open processes and influenced by the density of social interactions, alters the design of office spaces, reshapes the relationship between buildings, and is enhanced through mixed-use developments. In the Rotterdam Innovation District this is reflected in the successes made through co-location. Co-location does not also reduce overhead costs through the availability of space sometimes below rate and low risk turn-key work spaces, but also through technical spaces where expensive technologies are shared. It also stimulates face-to-face contact which supports social interactions and facilitates the exchange of personal and complex knowledge as a result of education and competencies.

Unfortunately, the Rotterdam Innovation District is still mainly car based, spatially isolated and turned inwards in terms of the lack of public plinths and vibrant street scapes. While innovation districts intend to facilitate open innovation within urbanized environments. The area still comprises many places that are not publicly accessible and dominated by a heavy infrastructures. To provide an open and mixed-use area, not only in the area and building level, activating streets and improving walkability and bike-ability can provide the potential for unexpected encounters, but also helps building a community sense; and attracts visitors.

How to envision and realize these spatial conditions and physical interventions, will be explained in the following chapter on the roles local public authorities can perform in innovation district planning and development.

## 8.3 EFFECTIVE ROLE-TAKING IN INNOVATION DISTRICT DEVELOPMENT

*What roles performed by local public authorities in innovation district planning, help develop an innovation district that stimulates (the processes leading to) innovation?*

This research is driven by the observation that cities are focussing investment and promotion on new locations where the knowledge economy might cluster and concentrate. Implying a certain ‘makeability’ or urban strategy that helps cities to pivot from traditions economic activities to knowledge-intensive and technology driven avenues for growth. These initiatives are mainly driven by the ambition of raising the innovation profile of a distinct area. In multiple cases they got branded as innovation districts, initiated by city governments and local public administrators, to promote the innovation economy and stimulate knowledge-intensive, innovation-rich economic developments.

The assumption made in the introduction of this research is confirmed in the case analysis conducted in this study. Several innovation districts, as the Rotterdam Innovation District, are mainly initiated as branding initiatives to address the ways cities and regions but also institutions intent to raise their innovate capacity in a distinct urban area. Nevertheless, these districts do not have the endowment, ecosystem, or expertise yet to host new innovative economic activities or boost urban regeneration.



The case analysis justifies the fact that innovation district visions and economic propositions are merely a way to use the concept as a tool to assess current assets. In this way development opportunities are addressed and buzz is created around a certain redevelopment project that stagnated or is endangered by multiple development challenges.

In this view, debating the possibility of the Rotterdam Innovation District was initiated to find common ground for redeveloping an unproductive urban area; generate public support on accelerating urban economic renewal; and revitalize a public-private partnership entrusted with the redevelopment project envisioned as innovation district. Initiating the concept of the innovation district as rebranding strategy became in this way a powerful instrument to create renewed awareness for the redevelopment project. It also opened the debate on (re)building new partnership(s) that may help to realize the vision set for innovative growth and accelerating redevelopments. However this requires multiple actions and interventions, in which role-taking by the initiators of the project becomes key.

During this exploration it became clear that this type of projects demand tailor-made development strategies and are highly context-dependent. Because, each district differs in weak and strong assets related to the concentration of innovators and how the processes leading to innovation are enabled on the urban district level. On the urban area level and in terms of organisation, the realisation of these districts is also shaped by market demand, the availability of space and the resources to deploy in relation to commitment to the project and the public support created (figure 8.3).

Besides, it must be acknowledged that to what extent an innovation district raises the innovation profile of a distinct area depends on the combined effect of multiple strategies. These strategies can differ per innovation district promoting specific economic avenues for growth, its diverse urban setting through mixing work with urban living, or by pointing out the presence of a strong economic network enhancing specific economic activities in favour of open innovation as in Rotterdam. In addition, the physical (re)development challenge can be regulated and communicated through a masterplan or a set of guidelines to incorporate maximum flexibility and adaptability. These examples underpin the fact that an innovation district strategy is defined based on context-specific economic, networking, or physical assets that are in need for improvement or refinement and built on context-specific assets that are in place and for which the area is promoted to be an innovation district in the first place, or for which it has the potential for becoming one.

A well-defined physical demarcation of the project scope, when initiating an innovation district, is sometimes lacking. Because, innovation districts mainly reflect economic development objectives as stimulate job opportunities or attract knowledge-intensive activities. When such projects are being initiated, they are deployed to mainly debate the possibility of an innovation district development. Nevertheless, even projects like these demand urban management. These projects are in need for the coordination of urban interventions to integrate public as well as private actions. Because, these activities take place in the built environment. In the case of the Rotterdam Innovation District the RDM and the Merwe-Vierhavens were addressed together, while there is yet little synergy between both locations and the main physical redevelopment challenges lies in the Merwe-Vierhavens.

Subsequently through the case analysis several planning and development challenges occurred when pre-planning an innovation-rich environment. From these observations can be learned that local public authorities can have difficulties in operationalizing their innovation district ambitions, creating public support and commitment to execute the project, and defining the physical conditions and interventions to increase innovative output and attract knowledge-intensive economic developments. These challenges can be conceptualized in 1) a design task, 2) a development task, and 3) a management task, to initiate and activate the innovation district project (figure 8.3).

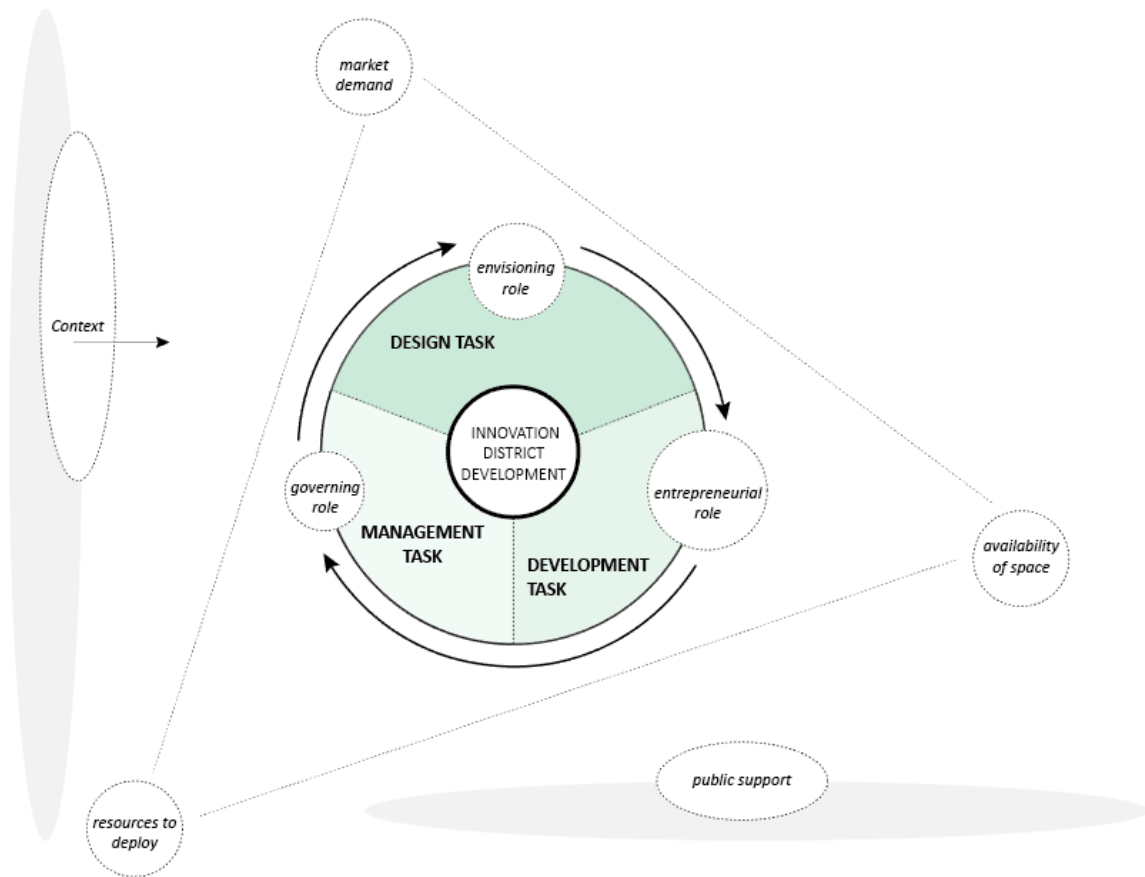


Figure 8.3 Innovation District development - field of influence

### *Design task – the initiative*

From the theoretical exploration on role-taking in innovation district development can be learned that local public authorities have a critical visionary role to play. In this role leadership vision is brought forth and tied to the long-term city (in the case of Rotterdam also towards the port) strategies to justify site selection, built commitment of the involved stakeholder, create public support to initiate the project, and accordingly focus investments and define the (physical) project scope.

From both theory as empirical findings can be learned that to initiate the innovation district, local public authorities have to be realistic and aspire an as inclusive as possible process. Because, when defining the innovation district concept it is important to include important stakeholders that bring in land, capital, and know-how to define the project scope. In this way the risks of an interlocked development due to contrasting development objectives is mitigated. Besides, the risk of planning for an innovation district that gets neglected by the envisioned end-users is diminished.

In addition, when dealing with a large scale redevelopments, an understanding on the financial implications of the (physical) improvements needed to accelerate developments is essential. This will help phasing the project and accordingly helps to choose the right moment to publicly or officially launch the project. Because, from the case analysis can be learned that there is a risk of losing momentum when a catalyst development is taking too long in the eyes of interested parties or actual formal stakeholders.

Therefore, when envisioning the innovation district but especially before launching and rebranding a certain area, the innovation district propositions have to be translated into decisions and actual interventions on the urban district level. In this regard, vision has to be followed by strategy formation enabling innovation district initiators to assess the feasibility of the project and narrow down the project scope by analysing how to improve ‘weak assets’ to accelerate developments.

This will give the initiator the opportunity to envision a more realistic development path that can be taken to bring the project into realisation referring to 1) building commitment and creating public support, 2) assessing deployable resources and the availability of space in relation to 3) the envisioned economic developments and actual market demand (figure 8.4). Anticipating on the implications the project may have on the involved stakeholders can be reached by involving:

- i. the envisioned (future) end-users to specify their preferred location preferences on a more operational level to plan for and invest in the right (physical) interventions;
- ii. experts and/or academics to guide the vision development to stimulate 'out-of-the-box' thinking, share knowledge, and to learn from best practices and/or academic explorations with overlapping contextual features or planning challenges;
- iii. and major land- and real estate owners and public decisionmakers to realise public support and built commitment of the private sector in an early stage to ease the development of the project, manage expectations and indicate the roles to be taken by them to make the project a success but also indicate how the project may benefit them more concrete.

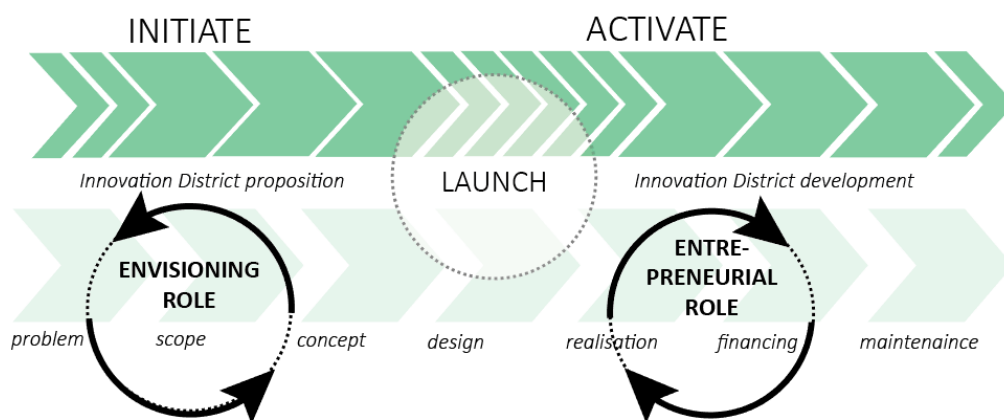


Figure 8.4 Conceptual model: Envisioning development path for realizing innovation districts.

For the Rotterdam Innovation District initiative, building commitment of the port authority has been taking quite some time as the concept was mainly researched and initiated from bottom-up within the city administration. Besides, with the changes in personnel and the departure of the initiator and driver of the project – former director of the Stadshavens programme office, the project is missing a public driver to promote the project. In this respect commitment and consistency in organisation on an operational level can help to bring economic aspirations that drive innovation district propositions closer to project implementation.

Development objectives as attracting human capital, stimulating job creation, and speeding up the transition towards a knowledge-intensive economy, have to be specified and translated into avenues for growth and performance measures on the district level. In this way – through the specification of a target group and the functionality of the place, the innovation district propositions can be translated into urban (re)development objectives and accordingly, into guidelines and principles, to plan for, design, and program the district as the place for innovation.

When envisioning the innovation district proposition and defining its development path, initiators should also study and specify what this development can mean in the wider context of its city and region. Besides connecting the vision to national, regional or district level development ambitions, insights into the envisioned avenues for growth and actual market demand is essential. From the case study can be learned that when localisation behaviour and spatial needs or interests of the envisioned economic activities are unknown, it becomes difficult to define spatial conditions and physical interventions to pre-invest in.

On the other hand, there is a risk of polarizing innovative have and have-nots in which a framework for accommodating innovation-rich activities may actually limit or exclude activities important to create an urban redevelopment which is as inclusive as possible. Local public authorities should therefore, acknowledge that the planning system does not know upfront whether an environment designed or promoted for its knowledge spillovers possibilities, targeting a specific avenue for growth, will actually result in a high innovative output. Because, as stressed in this research, innovation is more than a commercial concept or isolated event and the processes of knowledge creation and idea generation are equally important. Demanding the presence of knowledge-intensive companies, entrepreneurs, and start-ups within an inspiring and supportive environment. Nonetheless, throughout this exploration multiple management measures are mentioned to steer developments in favour of realizing an innovation-rich environment (figure 8.5).

### *Development task – the activation*

In theory, the capacity to innovate seems to depend on the collective effort of knowledge institutions, the private sector, public authorities, and civic society to organize and manage resources to stimulate innovation at the area level. This becomes apparent in the establishment of regional economic boards like in Amsterdam, Twente, and Groningen and development companies like Brainport Development Eindhoven to organize the process leading to innovation. In the Rotterdam Innovation District, both Stadshavens as the actual innovators present, believe in a laissez-faire approach towards the Innovation District project. Assuming that the capacity to innovate mainly rest with market-industry interactions which local public authorities but also other innovation district initiators and drivers should enable and facilitate.

This laissez-faire approach apparent in the case examined can be explained due to the fact that some local public authorities that initiate the innovation district are 1) embedded in closed local planning processes of a regulatory nature or 2) unfamiliar with collaborative planning approaches in which equal partnerships between knowledge institutions and private companies are established that exceed formal transaction-based interactions. Besides, the Rotterdam Innovation District differs from the campuses of Eindhoven and Groningen and the knowledge park of Twente due to its stronger focus on the commercialization and application of knowledge through prototyping rather than the processes of knowledge creation and diffusion.

In this respect, the development task to activate innovation district is based on the idea that innovation and the processes leading to it can be stimulated through location. This location is shaped by spatial conditions that can be managed through strategic courses of actions that guide location decisions and physical interventions. Accordingly, to prevent the initiative from becoming just a rebranding effort, these projects can be activated with specific investments and interventions on the urban district level in favour of either knowledge creation, diffusion, application or commercialization. From the case analysis can be learned that to manage and shape the spatial conditions to stimulate innovation and activate the Rotterdam Innovation District, a regulatory closed planning process is in force. Collaborative planning is lacking and accordingly delaying the innovation district development.

An entrepreneurial and risk-taking attitude is needed to react as a flexible and decisive organisation in realizing innovation district. This allows actual pre-investments to bring the project into realization. To date these pre-investments are yet lacking for the Rotterdam Innovation District. The municipality of Rotterdam takes a more facilitating role in terms of policy making in which the emphasise lies on sharing information and knowledge through the project team responsible for integrating the Rotterdam Innovation district project in both entities – port and city. It must be stressed that this approach has not led to an acceleration of developments. Because, relying on mainly bottom-up initiatives reflects a rather slow and gradual transformation process based on small impulses mainly concerning image improvement on a building level rather than actual developments and physical large-scale urban renewal.

The port authority, on the other hand, has the ability to act as investor/developer in redevelopment projects but has difficulties in allocating venture capital to actually act as private actor and activate the innovation district project. Besides, when formal arrangements will allow a more pro-active approach taken by the port authority it becomes challenges to what extent the project will bring forth an innovation-rich development in favour of socio-economic and spatial value creation.

### ***Management task – the continuation***

In the case examined in this research, the municipality of Rotterdam and the Rotterdam port authority are engaged in an alliance assigned to manage the redevelopment project in which the Rotterdam Innovation District development is planned. Both entities have assigned resources to the redevelopment project and accordingly are planning for the Innovation District. Up till now catalyst developments have not followed yet. In line with the assumption made in the introduction of this research, a growing sense of ineffectiveness and weak inter-organizational capacity, becomes apparent in this CityPorts alliance concerning the redevelopment of the Merwe-Vierhavens. Due to the large financial stakes, city and port development objectives are hard to match. Besides, negotiations and decision-making processes delay the innovation district development. It is clear that the municipality, however formally appointed to take a regulatory role in this project, is not able to take the lead in activating the innovation district through activating land, capital and real estate. Due to the recent revealed real estate fraud the municipal real estate department is under the barrel. Besides that, effective 'soft' management measures (e.g. zoning plans and building regulations) to ensure innovation district ambitions related to socio-economic and spatial added value are still pending. On the other hand, the port authority has difficulties taking a risk-taking entrepreneurial role in activating the innovation district by the lack of commitment and struggles with allocating venture capital. Accordingly, negotiations on the formal arrangements of the redevelopment project, delay the acceleration of investments and developments, to activate the project. It must, however, be acknowledged that this research is obtained during the operationalizing of the innovation district proposition reflecting a dynamic and evolving process.

To overcome these challenges on role-taking by both port authority and municipality, there are different management measures to be deployed in favour of innovation-rich developments. Based on the overall exploration on innovation district planning and development the following answer is constructed on the question: What roles performed by local public authorities in innovation district planning, help develop an innovation district that stimulates (the processes leading to) innovation?

***A visionary role when initiating the innovation district propositions comprising tangible development plans followed by a pro-active incremental development approach allowing small scale private-led developments and entrepreneurial public-private partnerships to activate the district and catalyse developments while safeguarding public interest concerning the quality of life and redistribution of collective benefits through strategic use of both soft as hard management measures.***

The theoretical exploration on innovation district planning and development, in combination with the in-depth case exploration, provides knowledge on effective roles local public authorities should deploy to initiate and activate the innovation district conceptualized in figure 8.5. But first it must be acknowledged that local public authorities have multiple roles and responsibilities to uphold as public entity in urban area development projects, as well as initiator and driver of innovation district developments. Ranging from shaping and regulating the built environment to facilitate economic development and enhance and guard a pleasant working and living environment. To prevent Innovation Districts from becoming just branding initiatives or neglected by the actual innovators, the innovation district vision must be empowered by a framework of guidelines and principles. This vision must be specified and operationalized to allocate the right interventions fitting the innovation district development objectives and focus investments while providing a transparent basis for either transaction-based commissions or long-term commitment to the desired end-users.

In this way the private sector can be persuaded to partner in this innovation-rich developments. Because the lack of tangible plans and undefined ambitions pose uncertainties on which the market does not want to speculate. Besides, innovators demand concrete visions. This could be found in public schedules of requirements that are detailed enough to secure specific innovation district ambitions but also flexible enough to attract diversity and provide room for negotiations in which planning gains can be established on the contribution towards public benefits/functions (innovation).

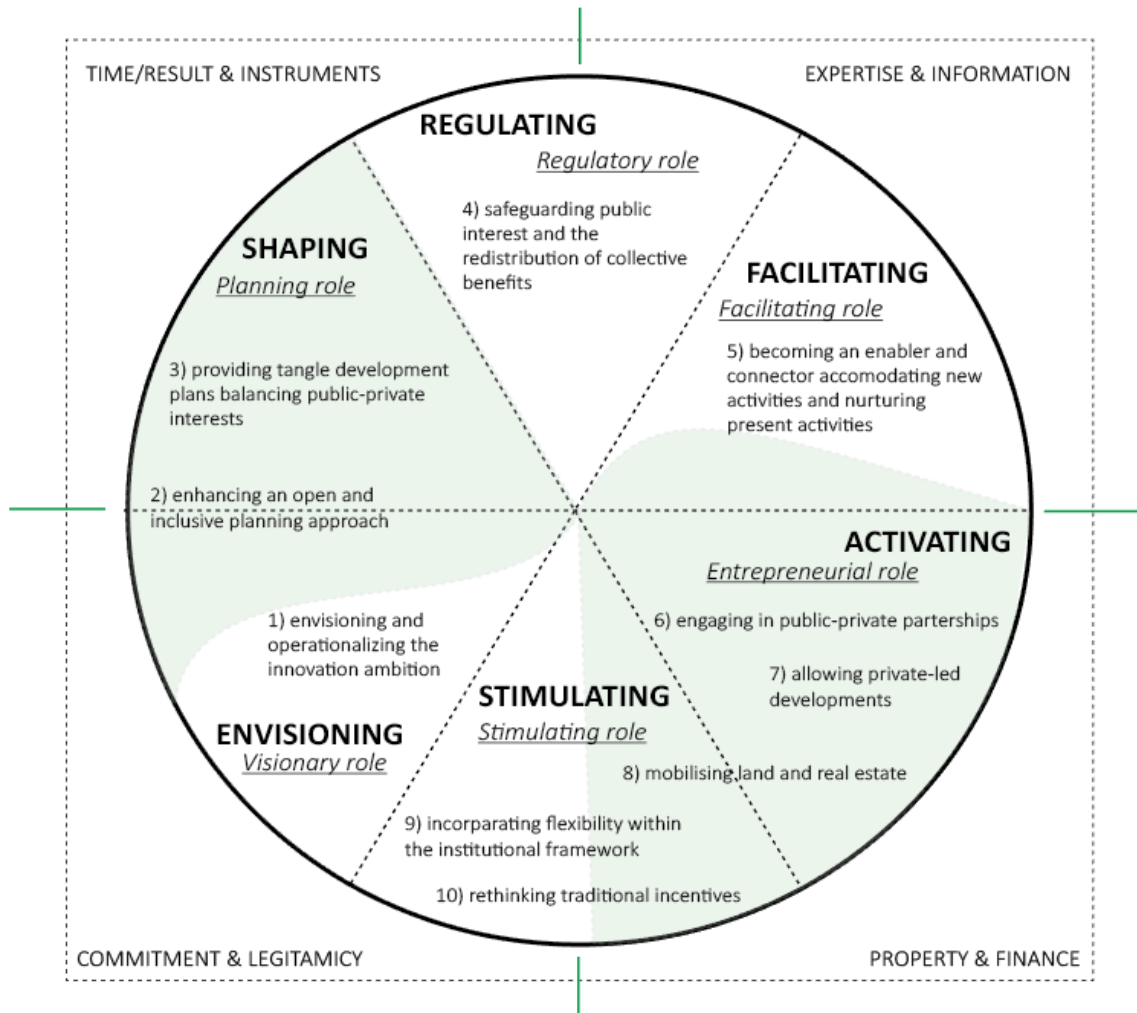


Figure 8.5 Innovation District management task

To bring innovation district plans to realisation, negotiations become essential to realize public interest. This demands entrepreneurial skills and competencies to safeguard conditions in design and program that may spur innovation. In this regard, a balance between generating profit from the development and contributing to collective benefits as public amenities and an improved quality of life, needs to be found between public-private interests.

Accordingly strategic planning documents should create a good political and legal urban environment and facilitate the private sector with policy and clear objectives; explicit performance standards and indicators; while incorporating flexibility. However, expertise and competencies define to what extent local public authorities become an compatible interlocutor towards private actors. In this way the municipality has the opportunity to adopt a more active role in facilitating the processes leading to innovation in which a pleasant working and living environment is created. As investments are needed to realise the pronounced ambitions and bring these projects into a new development phase, local public authorities can and should engage in multiple roles. They should consider a more active role in facilitating the processes leading to innovation through incentives, negotiations, or smart urban policies.

From both theory as empirical findings can be learned that local public authorities are no longer able to initiate or finance large scale urban development projects like innovation districts. They therefore have to join forces in public-private partnerships or are depending on bottom-up urban initiatives. Local public authorities should therefore allow spontaneous market forces to stimulate innovation and the processes leading to it. Collectively, these partnerships can design long-range visions; create new vehicles for innovation, such as research centres and incubators when involving knowledge institutions; or explore flexible real estate concepts and new urban planning schemes. In this way an inspiring innovation-rich environment can be designed.

When opening up to new partnership or by joining forces with the promoted end-users known for their entrepreneurial attitude, creative thinking can be found with the private sector. However, this demands transparency and structural and consistent interactions to build more strategic partnerships in which a common goal is set for a certain period of time. Accordingly, commitment on unconventional thinking and an active participation in developing these districts can be achieved by allowing small-scale private-led developments or by participating in more entrepreneurial public-private partnerships. However, local authorities need to find a balance between the need of private investors to generate profit from the development and their contribution to collective benefits as public amenities and spatial quality. On the other hand, the development of the innovation district can also be stimulated by local public authorities through the level of flexibility within the institutional framework. Subsequently, to become a reliable partner in innovation-rich projects, a more entrepreneurial role is demanded in which local public authorities are able to adapt a flexible and market-responsive development approach.

When local public authorities are not able or willing to allow private-led developments; do not have the resources to improve infrastructure and public space; and cannot facilitate local bottom-up initiatives, it becomes very hard to actually add value to the project. To mitigate risks, downsize the allocation of public means, and allow small scale private-led and bottom-up initiatives, the project can be activated through a pro-active incremental development approach. In this view, developments are actively promoted and communicated through clear guidelines and tangible development plans, building on what is already there, to market the project and create private sector interests. Besides, planning gain is defined to provide a greater action perspective for either private actors allowing private-led developments, and for local public authorities to co-invest and subsequently add value to the project. It must be acknowledged that when local public authorities engage in public-private partnerships, finding shared development objectives is of essence, because when these are missing or poorly identified, the project can stagnate and become under serious pressure. Municipalities should therefore, make more strategic use of its 'soft' management measures (e.g. zoning plans and building regulations) to ensure innovation district ambitions related to socio-economic and spatial added value.

Thus, to plan for and subsequently develop an innovation district a more pro-active development approach can help local public authorities realize an innovation district that stimulates (the processes leading to) innovation. This approach should reflect a visionary role that provides leadership vision, translated into clear development plans in which land, real estate and capital is deployed, and 'soft' management measures used more strategically in favour of stimulating innovation and the processes leading to it (e.g. planning instruments and expertise). Besides that, the project organisation should be open to entrepreneurial partnerships or private sector involvement (ranging from sharing knowledge and expertise to actual developments) to activate the innovation district development. This will enable local public authorities to take a more entrepreneurial role in terms of participating in investment funds; sharing risks and revenues in public-private partnerships; and act as a consistent reliable partner for market parties while guarding public interests.

## 8.4 RECOMMENDATIONS ON INNOVATION DISTRICT MANAGEMENT

### *Managing innovation district developments*

From this exploratory research can be learned that top-down initiated innovation districts can be realized through joint public-private actions in which spatial policies should be linked more closely to project implementation. To do so public and private actors can deploy multiple management measures to ensure the realization of an innovation-rich development addressed in the previous chapter. According, from previous conclusions the following recommendations are defined on innovation district management.

#### **STEP 1: The initiative**

*Local public authorities first have to create enough public and political support before launching the initiative to mitigate the risk of losing momentum and prevent the project for unrealistic expectations.*

**Envisioning and operationalizing the innovation ambition;** local public authorities have to make sure the innovation district concept has the potential to serve as foundation for development guidelines and basic principles. Innovation district propositions must ease the process of defining the avenues for growth and the spatial requirements needed to support the envisioned activities. This becomes essential to not lose momentum and save time when translating the concept into concrete economic and urban strategies on realizing the project.

**Enhancing an open and inclusive planning process;** local public authorities should enhance an open and inclusive planning process. Because, citizen participation, the involvement of social entrepreneurs, and bottom-up civic initiatives have the potential to spur new knowledge and innovation and create new opportunities for market, knowledge, and network spill-overs in which social issues are being addressed as well. Besides, consulting the envisioned (future) end-users, experts and/or academics, real estate developers and public decisionmakers may help to indicate opportunities and treats; allocate planning gain; focus investments; and manage expectations.

**Providing tangible development plans balancing public-private interests;** local public authorities should incorporate a sense of flexibility and adaptability within their development plans without losing clarity and priorities on which the market can respond. Because, when innovation ambitions are not concretized they are likely to be postponed or simply forgotten.

**Safeguarding 'innovation interests' with 'soft' management measures;** to remain flexible and adapt more easy to changing market demands masterplans are exchanged for 'gaming rules'. These plans provide room for negotiations and discussion. Therefore, local public authorities should use zoning plans and building rights, or tender procedures more strategically in favour of stimulating innovation through the built environment. The use of such legal public planning instruments provides an opportunity to regulate developments in such a way that public objectives are being secured. Besides that, it opens the debate to incorporate innovation ambitions concerning, for instance, spatial quality and public space in private-led developments.



*Local public authorities may face multiple difficulties to realize the innovation district project due to the lack of resources (e.g. expertise, time, venture capital). Therefore, local public authorities have to consider:*

- How are the land positions divided in the project scope, allocated as Innovation District?
- To what extent can we, as local public authority, realize the project through public interventions?
- Can the project be realized by the private sector through minimal public regulations?
- Are we, as local public authority, willing to give up (partly) control on this redevelopment?
- Is the project interested enough for the private sector in terms of profit-risks appropriation and flexibility to optimize land uses?

## **STEP 2: The activation**

*After exchanging views on the previous trade-offs, local public authorities can activate the district as follows:*

**Becoming an enabler and connector for new activities and nurture present innovators;** local public authorities have to be realistic and critical about what is all reading in place and focus on facilitating possible existing clusters to grow into networks in favour of stimulating open innovation. In this respect, be careful with defining ‘innovative have and have nots’ and appointing certain companies and activities as not innovative enough. This may actually limit or exclude activities important to create an environment which spurs innovation. Because, innovation is important both as economic output as the processes leading to in in which knowledge is created, combined and accordingly applied.

**Engaging in entrepreneurial public-private partnerships;** to organize the processes leading to innovation and accommodate innovation-rich activities, local public authorities should join forces in public-private partnerships. When partnering with entrepreneurs, knowledge institutions and creative developers, inspiring innovation-rich environment can be designed. Because, creative thinking can be found with the private sector and collectively, these partnerships can design long-range visions; create new vehicles for innovation, such as research centres and incubators when involving knowledge institutions; or explore flexible real estate concepts and new urban planning schemes.

**Allowing private-led developments;** local public authorities should allow bottom-up urban initiatives and private-led developments to spread financial risks and downsize the allocation of public means. To persuade the private sector to co-invest in the project and contribute to socio-economic and spatial ambitions, local public authorities must become compatible interlocutors towards private actors while securing ‘innovation interests’.

**Mobilizing land and real estate;** local public authorities should broaden their action perspective and activate economic assets as land and real estate while assigning knowledge and expertise to manage the redevelopment project. In this way they can to set an example and catalyse further developments.

**Incorporate flexibility within the institutional framework;** local public authorities should have the ability to speed up planning processes and provide flexible legislations towards favourable activities. This can help unburdening the companies, knowledge institutions, and entrepreneurs of importance to the realisation of the innovation district and may attract new activities.

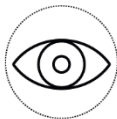
**Rethinking traditional incentives;** local public authorities should not only focus on financial incentives. As innovators seem attracted to what the environment has to offer them, land use incentives can attract new activities but also benefit present activities and improve the quality of space. This goes beyond providing rent reductions, flexible lease contracts, or embedded growth models.

## 8.5 RECOMMENDATIONS ON PROJECT OUTCOME AND DEVELOPMENT APPROACH

### *Stimulating innovation through the built environment in the Rotterdam Innovation District*

From this exploratory research can be learned that the Rotterdam Innovation district represents more of a proximity cluster in which individual innovators find added value of place through co-location and knowledge spillovers on a building level, in combination with the proximity advantages for its closeness to the city centre of Rotterdam on the urban area level. On the urban district level however, much can be improved to raise the innovation profile of the area and enable actual knowledge spillovers. In terms of organisation, municipality and port authority have difficulties in taking an envisioning role – in favour of stimulating innovation more strategically through the built environment, and an entrepreneurial role – by bringing in venture capital needed to activate the innovation district project.

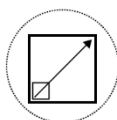
Therefore this chapter provides two types of recommendations concerning the location-specific analysis of the Rotterdam Innovation District. The first set of recommendations advises on how the built environment can be deployed more strategically to stimulate innovation at the urban district level. The second set of recommendations advises on what roles municipality and port authority can deploy to benefit the innovation district development.



**Make it real;** the success of the innovation district concept is depending on the consistency of its realisation. Stadshavens therefore has to focus on keeping the concept alive and making it real. As port authority and municipality cannot deploy an entrepreneurial role or bring in venture capital at the moment, they should take a more supporting and unburdening role towards bottom-up initiatives. Enabling (temporary) activities and events, to strengthen the innovation district identity and support a constant flow of people, linked to the envisioned end-users and innovation-rich activities. Parallel to that, Stadshavens should allocate development opportunities to be realized by (or in collaboration with) the private sector, envision planning gains, and provide a greater action perspective for stakeholders that can bring in venture capital, to activate the innovation district.



**Make it start;** Stadshavens should focus on the project(s) that is/are most likely to bring forth a catalyst development in the short term to accelerate developments – however placed in the context of the long term redevelopment. More important, Stadshavens should focus on facilitating existing clusters to grow into open networks, to enable and stimulate knowledge spillovers. Therefore information on what the actual innovators do and need (on the urban district level in terms of location factors) is important to uncover.

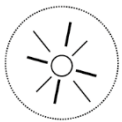


**Make it grow;** Stadshavens should be careful not to polarize ‘innovative haves and have nots’ and refine urban strategies on stimulating the processes leading to innovation. In this view port authority and municipality should not only focus on accommodating knowledge-intensive and innovation-rich activities but also take a more pro-active and entrepreneurial role in envisioning and mobilising the built environment in facilitating knowledge spillovers, support idea generation, and above all attract human capital.

In this way innovation can be stimulated more strategically through the built environment to 1) attract visitors, 2) create vibrancy and community sense, 3) enable amenities that increase the diversity of people and enhance the diversity of people, and 4) enable the processes leading to innovative output.



**Make it urban;** Stadshavens should become a compatible negotiator towards private actors on the incorporation of innovation ambitions in new developments. In this respect, ‘soft’ measurement measures have to be used more strategically to coordinate economic growth, while minimizing future land use conflicts, maximizing flexibility and incentivizing innovation-rich developments. In this view, 1) building regulations and dimensions for new developments should improve density, urbanity, and diversity; 2) slow and fast connections should enhance connectivity, accessibility, and proximity; 3) vision on quality of attractive public space should attract the envisioned end-users, residents, and visitors, to improve attractiveness, vibrancy, and create community sense; and 4) strategies on activating empty plots and vacant real estate should incorporate flexibility to improve availability, adaptability, and make room for experimentation.



**Make it vibrant;** Stadshavens should provide general guidelines that enable a 24H culture while strengthening the identity of the place and supporting existing activities that need to be retained and nurtured, while attracting new developments. Because, the willingness to make changes or allow them to happen, is essential to bring the innovation district development into practice. Stadshavens has to provide spatial plans that enable a 24H culture but also tempts the private sector to co-invest in public and urban amenities and create planning gain for private actors to contribute to ‘innovation district interests’. This demands basic principles on mixing residential developments with still present industrial activities to create effective planning tools related to zoning, legislation, and contracts, that can help realise the innovation district ambition. These planning tools may incorporate land use incentives like increased building rights per square metre when plans entailed knowledge intensive activities and regulatory structures on mixed-use and preservation of heritage, guarantying the incorporation of innovative amenities.

As the area still functions as industrial area the district can urbanize gradually by creating critical mass for public amenities through, for instance, regulating functions that can be shared by multiple users. For example, centralizing facilities as parking, conference facilities and hospitality amenities, to increase the density of social interactions. An improved urban and vibrant setting can help to accelerate the redevelopment and does not always have to imply great financial investments. Through strategic planning on placemaking and temporary use; on quality trade-offs concerning interventions in public space or physical district branding; or by facilitating bottom-up initiatives or allowing private-led developments, costs can be mitigated, shared, or transferred to the market.



**Make it connect;** Stadshavens should improve the lack of continuing and systematic interactions between companies located in the area to enhance open innovation and make the Rotterdam Innovation district successful for the absorption of knowledge spillovers and the capacity to collaborate, while providing a sense of belonging. To transform the Rotterdam Innovation District into an environment where companies, organisations and individuals find each other and collaboratively create new or better ideas, services, and products, Stadshavens could think about assigning a community manager within the project team. The community (or innovation/business) manager is entrusted with the task of maintaining the dialogue with the innovators present in the area to become a connector and enabler within the innovation district community; provide a transparent base for possible partnerships; and share knowledge and expertise to facilitate and unburden the end-users within the project.

## 8.6 RECOMMENDATIONS FOR FURTHER RESEARCH

After reviewing this exploratory study, the following recommendations for further research are suggested:

First, this research has focused mainly on exploring the physicality of innovation in relation to the concept of innovation districts. The object of study was narrowed down by focussing on top-down initiated innovation districts in Dutch practice, driven by local public authorities, concerning the typology of re-imagined urban areas.

- A further understanding on the role of knowledge institutions and private investors and developers can help to build knowledge on what type of entrepreneurial public-private partnerships can bring forth innovation-rich environments. Accordingly, this can provide more specific insights into what type of organizations local public authorities should partner with to stimulate innovation through the built environment.
- In respect to the more entrepreneurial role, to be taken by local public authorities as advised in the exploration, further research could explore land use incentives and the flexibility possible within the institutional framework in favour of innovation as local public authorities may lack capital, real estate and land to activate.
- Besides, an exploration on the competencies and expertise necessary to become an enabler and connector in innovation-rich environments can help to gain insight into the ways local public authorities can become compatible interlocutors for the private sector and safeguard the 'innovation ambition'.
- In addition, a deeper understanding of the incubator role innovators can deploy within innovation district developments, can provide new insights into strategic drivers in innovation-rich or knowledge-intensive developments.

Besides, in this research theoretical findings are validated empirically by testing them on a single case. By evaluating these findings in other innovation-rich developments, the conceptual models provided in this exploration on the role of the built environment and effective tole-taking in innovation district developments, can be verified, refined and strengthened.

## 9. REFLECTION

*This reflection provides an evaluation on the graduation thesis (product), the choice of methods, argumentation and chosen approach (process) while placing the work done in time (planning), and reflecting on the learning objectives formulated in the P2 rapport (personal).*

**The relationship between the graduation lab and the subject & case study chosen;** this research has taken place in the lab ‘Sustainable Private Sector-led Urban Development’. According Heurkens (2012) new types of private-private and public-private interactions and collaborations seems to be a requisite to reach truly sustainable solutions in the existing built environment. When it comes to sustainable private sector-led urban development projects – projects in which private actors take a leading role and public actors adopt a facilitating role, in managing the delivery of an economic-viable, social-responsible and environmental-friendly urban development project – a lot of insights are still missing. To add to that, in Dutch urban development practice the emphasis is shifting towards incremental development processes and private sector-led developments. There is limited scientific and practical understanding about how public and private actors cooperate within private sector-led urban development projects and what the effects of their interactions are. So, more attention towards aligning theory and practice is needed. Therefore, to contribute to the scientific and practical understanding on how public and private actors cooperate, this research has built a deeper understanding on the CityPorts alliance, in which the port authority can be seen as a private actor, collaborating with the municipality of Rotterdam in redeveloping the inner-city ports of the city.

**The relationship between the graduation lab and the chosen methods;** the object of study concerns the concept of Innovation Districts. This urban policy is seen as an early trend that, had received little scientific analysis yet and was mainly known for international best practices (Katz & Wagner, 2014). Thus, to provide an understanding on innovation districts as urban area development projects, an in-depth case analysis on the Rotterdam Innovation District was chosen. The initial idea was to conduct a comparative case study and compare the development approach and project outcome behind best practices as the 22@Barcelona and the Boston Seaport project – cases I pre-selected based on available documentation, proven (economic) success, and development stage. In addition, a case from Dutch practice was added; the Central Innovation District of Den Hague based on practical and locational considerations – concerning language, access, proximity, same region, corresponding actors. While exploring the research topic I learned how context-specific these developments are and decided to produce new forms of understanding and practical knowledge on innovation districts through a single in-depth case study design. In this way a deeper understanding was built on a single innovation district initiative and the local planning processes in which the project is embedded.

*‘Innovation Districts have the unique potential during this pivotal post-recession period to spur productive, inclusive, and sustainable economic development. They help address three of the main challenges of our time: sluggish growth, national austerity and local fiscal challenges, rising social inequality, and extensive sprawl and continued environmental degradation.’*

*(Katz & Wagner, 2014)*

**The relationship between the project and the wider social context;** ‘stimulating innovation has been a topic widely investigated in the fields of management, policy, economic geography and regional studies, because it is critical for maintaining competitive advantage of organisations and nations’ (Curvelo Magdaniel, 2016). Besides, innovation districts are seen as a way to strengthen the innovative capacity of cities and regions. Therefore this study builds an understanding on how cities may agglomerate knowledge-intensive activities to modernize their economies; how they can play a catalytic role in enabling and growing innovation districts; and which carefully planned interventions are needed to do so.

**The relationship between theoretical and empirical research;** providing an understanding on innovation districts as urban development projects brings many challenges due to the fact that innovation districts are mainly analysed from an economic geographical perspective and became a popular concept in spatial planning. These areas are emerging in a wide variety of distinctive types; deal with the complexity of facilitating and stimulating (open) innovation; and combine many different urban theories ranging from Marshall’s ideas on the industrial district (Marshall, 1920) to Chesbrough’s theory on the improvement of internal and external innovation (Chesbrough & Crowther, 2006). In addition, the concept of innovation districts includes the ideas of Florida on the role of the creative class (Florida R. , 2002); Jacobs’ urban theories on mixed-use within the city (Jacobs, 1969); Porter’s cluster theory on economic competitiveness (Porter, 2000); and Leydesdorff and Etzkowitz’s triple helix and quadruple helix model on the dynamics of innovation (Etzkowitz, 2008).

Academic research on innovation districts undertaken by Katz & Wagner (2014) and Morrison (2015) are both driven by research on knowledge-intensive milieus (Link & Scott, 2006; van Winden, 2011); a changing society, economy and city (Jacobs, 1969; Florida, 2002; Hall, 2004; Castells, 2011; Simmie, 2013); city development and urban competitiveness (Clark, 2010; Glaeser, 2011; Porter, 2011) and the geography of innovation (Audretsch, 1998; Leydesdorff & Etzkowitz, 2003; Chesbrough, 2006). Besides that, recent empirical studies conducted by the Urban Land Institute and the Dutch Environmental Assessment Agency (PBL) in collaboration with Ruimtevolk on innovative environments and best practices in Dutch and International context, provide lessons for cities that want to develop innovative environments like innovation districts (Clark, Moonen, & Peek, 2016; Lekkerkerker & Raspe, 2016).

In this respect, this exploration has combined several concept from theory that derived from different fields of research to build knowledge complementary to existing research in the field of urban management.

**Process evaluation;** when I started my graduation research in February 2016 my internship at the Port of Rotterdam Authority continued and I gained the opportunity to work on my thesis parallel to gaining practical knowledge on the redevelopment of the Merwe-Vierhavens. I learned a lot and it gave me lots of pleasure. Parallel to this, I participated in several committees and inspiring electives besides my side job in Delft. Long story short, I overestimated the time available and the difficulty of putting it all together. This affected the duration of my master thesis and became apparent after my P2. Because, although I had a strong vision on what I wanted to investigate in terms of topic and angle, I was lacking focus in my research in terms of depth, essence, and demarcation. My internship got extended twice and balancing practice (internship) and research (study) became a big challenge because I liked working better than finalizing my graduation project. I struggled with the idea of delivering a research that was eye-opening, pioneering, or at least interesting for the company I work for but also delivering a proper academic research meeting the standards of my professors, within the time I freed for it. Important lessons learned along the way 1) prepare counselling moments properly; 2) make smart use of the knowledge and expertise of your professors; 3) dare to share preliminary work during the process; it can enrich your research and provide new perspectives; 4) define the problem, goals, research questions as clear as possible, to help structuring and narrow down your research; and 5) don’t forget that learning should besides meaningful be fun!

**Achievement levels;** within the Graduation Laboratory MBE course book (Department of MBE, 2016) several achievement levels are mentioned. Based on these achievement levels I formulated 3 personal learning objectives at the beginning of this graduation project.

*Quality within requirements and preconditions:* ‘I would love to gain more knowledge about the relationship between people and the built environment to understand their objectives, needs, standards and wishes and translate their requirements into measurable qualities and manageable factors.’

This research topic in relation to my internship position gave me the opportunity to get to know more about urban development practice to provide a critical reflection. Besides, the final synthesis allowed me to conceptualize findings into manageable factors.

*Markets, actors, processes and procedures:* ‘Understanding the position and roles of various stakeholders; the decision-making processes and procedures in development projects; and risk and ownership allocation, in combination with insights into management measures deployable in urban area development projects that can help to realise projects as envisioned.’

These research gave me a better understanding on urban development projects and helped building theory on specific and decisive development dynamics in relation to roles, strategies and project outcome of a particular large-scale and complex contemporary urban redevelopment project.

*Academic contribution:* ‘The ability to make an inspiring contribution at an academic level in the domain of Urban Development Management.’

This was an important goal at the beginning of this graduation thesis. Along the way this ambition was given up a bit due to the fact that I didn’t take enough time to execute the project as I envisioned. Nevertheless, I am pleased with the final outcome through the knowledge that was built along the project, visualized and described as presented in this thesis.

***Main lesson for me: easy reading is quite hard writing.***

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# APPENDICES

## Appendix A: Location theories (Meijer, 2015)

Location theories based by Meijer (2015)			
Location theory	Focus	Characteristics	Location factors
(neo) classical approach	understanding financial drivers through cost reduction & revenue optimization	'hard' location factors	<i>transportation costs</i> <i>production costs</i> <i>labour costs</i> <i>land/real estate costs</i> <i>market size/position</i> <i>etc.</i>
behavioural approach	understanding subjective localisation decision-making	irrational considerations internal factors 'soft' location factors	<i>quality of life</i> <i>reputation of the area</i> <i>attractiveness of the building</i> <i>personal motivation</i> <i>etc.</i>
institutional approach	understanding the importance of the social and institutional context	external factors policy factors cluster factors	<i>legislation and regulations</i> <i>government policies</i> <i>subsidies</i> <i>power relations</i> <i>relations</i> <i>etc.</i>
evolutionary approach	understanding company survival and the importance of adaptation to change	external factors long-standing factors cluster factors	<i>proximity of partners/suppliers</i> <i>knowledge-spill overs</i> <i>qualified employees</i> <i>etc.</i>

## Appendix B: interview protocol (NL) & list of interviewees

### - Themes semi-structured interviews -

#### **VESTIGINGSKLIMAAT & LOCATIE VOORKEUR; De toegevoegde waarde van deze locatie**

Cities that are implementing innovation districts aim to attract companies and individuals not only through fiscal and economic incentives but by providing what innovative companies and young professionals want (Katz & Wagner, 2014).

Companies relocate to a certain city, for instance, to have access to talented 'creative' professionals, for institutional support through supportive policies and flexible legislation, enabling and facilitating governments and public institutions, the quality of life, or an overall improved innovative capacity (Morisson, 2014).

Companies, for instance, seem more attracted to cities as business location and become more location bounded, despite globalisation which provide companies the opportunity to become more footloose (Van De Klundert, 2008).

Looking at existing innovative milieus, they all benefit from agglomeration advantages at the regional scale, like urban facilities, infrastructure and connectivity, matching employment possibilities, economic diversity, knowledge sharing and productivity (Lekkerkerker & Raspe, november 2016).

#### **STIMULEREN VAN INNOVATION; De toegevoegde waarde van het gebied**

Districts that stimulate (open) innovation within the city emerged from bottom-up leadership or tell stories on companies, knowledge institutions and supporting facilities that clustered more organically within the city.

This new urban agenda regarded as 'Innovation districts' is calling for 'new urban development schemes embracing the city as the place for innovation' (Curvelo Magdaniel, 2016).

A strong collective effort seems essential to organize collective actions and manage resources to stimulate innovation at the area level (Lekkerkerker & Raspe, november 2016).

#### **ROTTERDAM INNOVATION DISTRICT; De toegevoegde waarde van het (label) RID**

From the perspective of cities and regions these areas are seen as locations that can bring forth new economic growth paths, attract investment, talent and knowledge workers, improve a city's image and physically regenerate old city areas (Carvalho & van Winden, 2017).

When promoting an innovation district by allocating opportunities and building an innovation strategy a catalysing development is expected to follow up the branding initiative.

#### **REDEVELOPING THE Merwe-Vierhavens; Rol Stadshavens & betrokkenheid planvorming**

Dutch urban development practice is characterized by a growing sense of ineffectiveness and inefficiency (Heurkens, 2012).



## *- Statements for discussion - semi-structured interviews -*

### **Goal**

Het RID heeft als voornaamste doel het hervinden van een gemeenschappelijk belang in de herontwikkeling van de Merwe-Vierhavens binnen de samenwerking stad-haven.

### **Avenues for growth**

Het stimuleren van een activiteit past beter bij de ontwikkeling van het RID dan het promoten van diversiteit of clusters

### **Business climate**

Locatiefactoren als kosten, marktomvang en agglomeratievoordelen zijn doorslaggevend ten opzichte van de leefkwaliteit en de aantrekkingskracht van een gebied of gebouw.

### **Innovation**

Het stimuleren van innovatie en samenwerking, als bedrijfsprestatie, zijn belangrijker dan het reduceren van kosten, vergroten van de productiviteit, of het verhogen van de klanttevredenheid.

### **Roles**

Als ondernemer heb ik behoefte aan een gemeente die mij niet door middel van huurkorting weet te binden aan een plek maar mij weet te binden door dat wat het gebied mij te bieden heeft aan kwaliteit, bedrijvigheid, levendigheid

### **Integrated development approach**

De ontwikkeling van het RID vraagt om een meer integrale ontwikkelstrategie ten opzichte van de huidige organische ontwikkelstrategie

### **Collaborative planning**

Havenbedrijf en gemeente Rotterdam moeten actief bedrijven, onderwijsinstellingen en buurtbewoners betrekken in de planvorming van het RID

### **Pro-active development approach**

Een proactieve houding van Gemeente en Havenbedrijf – ‘out-of-the-box’ denken, visionaire strategie vorming, actief eigen vastgoed inzetten, coaching en subsidieverstrekking – is op dit moment belangrijker in de ontwikkeling van het RID dan een reactieve houding – beleidvorming, contractvorming, informatieverstrekking.

*- Interview protocol- semi-structured interviews -*

Introductie: Lancering Rotterdam Innovation District
<p>1) Aanleiding: <i>Wat was de aanleiding voor de lancering van het Rotterdam Innovation District?</i></p> <p>2) Initiator/Promotor: <i>Wie was de initiator van het project?</i></p> <p>3) Doelen: <i>Wat is het voornaamste doel van het RID?</i></p>
Deel 1: Van ambitie naar uitvoeringsstrategie
<p>4) <i>Wat voor type interacties en beslissingen hebben geleid tot de huidige uitvoeringsstrategie?</i></p> <p>5) <i>Wie zijn invloedrijke actoren/personen geweest in het formuleren van de uitvoeringsstrategie?</i></p> <p>6) <i>Hoe zou u de aanpak van dit project omschrijven?</i></p> <p>7) <i>Hoe ziet u de samenwerking tussen Gemeente en Havenbedrijf in de context van het RID?</i></p>
Deel 2: Samenwerkingsverband Gemeente/Havenbedrijf
<p>8) <i>Hoe ziet u de samenwerking tussen Gemeente en Havenbedrijf in het algemeen?</i></p> <p>9) <i>Wat zijn hierin invloedrijke actoren/personen; de besluitvormers?</i></p> <p>10) <i>Wat zijn belangrijke evaluatie criteria om het succes van de samenwerking te monitoren?</i></p>
Deel 3: RID; een kritische reflectie
<p>11) <i>Heeft de lokale politiek veel invloed op de planvorming RID, is dit goed voor het proces?</i></p> <p>12) <i>Wordt het initiatief gesteund door de stad? Op welke manieren kunnen we dat zien?</i></p> <p>13) <i>Wordt het initiatief gesteund door de haven? Op welke manieren kunnen we dat zien?</i></p> <p>14) <i>Zijn buurtbewoners, ondernemers en andere belanghebbenden voldoende betrokken in de RID planvorming, kan dit in de uitvoering nog beter?</i></p> <p><b><i>‘Het is nu belangrijk om vanuit het RID leiderschap te tonen’</i></b> (RID uitvoeringstrategie, sept 16)</p> <p>15) <i>Welke rol speelt de RID organisatie in het behalen van de gestelde ambities in de uitvoeringsstrategie?</i></p> <p>16) <i>Welke instrumenten zijn hierbij van belang?</i></p> <p>17) <i>Wat is een passende vastgoedstrategie om deze ambities te verzilveren?</i></p> <p>18) <i>Wat voor interventies zijn hiervoor van belang?</i></p> <p>19) <i>Wanneer is het RID een succes?</i></p> <p>20) <i>Wat kunnen we verwachten van het gebiedsteam M4H in 2017?</i></p>

*- List of interviewees -*

<i>Exploring subject - unstructured</i>		
Thomas van Bergen	Position Paper / advisor	<i>Deloitte</i>
Maike Akkers	voormalig gebiedsmanager	<i>Port Planning</i>
Rik Dalmeijer	gebiedsmanager HbR	<i>Port Planning</i>
Judith Lekkerkerker	onderzoek Innovatieve Milieus	<i>Ruimtevolk</i>
<i>Orientation – the Rotterdam Innovation District in relation to the case of Den Hague</i>		
Frank van den Beuken	Gemeente Rotterdam / Den Haag	<i>Planoloog</i>
Wouter Spijkerman	Proposities Den Haag	<i>Site Urban Management</i>
<i>Case analysis Rotterdam – a public perspective</i>		
René Lamers	adviseur gebiedsexploitatie	<i>Financial Strategy</i>
Walter de Vries	planoloog	<i>City Development</i>
René Schmitt	salesmanager	<i>Sales - acquisition - real estate</i>
<i>Case analysis Rotterdam – an ‘innovators’ perspective</i>		
Marc Schellekens	Labhotel	<i>innovative entrepreneur</i>
Martin Luxemburg	ECE	<i>incubator</i>
Guus Balkema	SuGu / 010 works	<i>the collaborative innovators</i>
Remco Borst	Speck Design	<i>real estate perspective</i>
Lidi Brouwer	Studio Roosegaarde	<i>the single innovator</i>
<i>Exploring the research topic - exploratory interviews/interesting talks</i>		
do 8. sep 2016	Julie Wagner & Greg Clark	
ULI workshop: Building the innovation economy in Rotterdam		
vr 11. nov 2016	Greg Clark, Gert-Joost Peek, Walter de Vries	
Stadsmakerscongres: Reflecting on the ULI workshop		
wo 16. nov 2016	<i>Raspe, Van Leest, Boogers, Meijers, Stam</i>	
Ruimtevolk: Expeditie Innovatiemilieus		