The Hague international city of peace, justice and security
urban strategy and design for an innovative knowledge cluster

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The Hague international city of peace, justice and security

Research, strategy and urban design for the development of the security cluster into an innovative knowledge cluster
lost to create what is missing.

### DESIGN PRINCIPLES -

- **Concentrated**
- **Areas**
- **Programmatic Clusters**
- **Interaction Environments**
- **Embedded International & Local**

The security sector in The Hague should be the place where the local and the international can collaborate. However, the potential for the security sector is much bigger, and the challenge is to create the specific spatial conditions for development into an innovative knowledge cluster. Innovations and development of knowledge in this area are crucial for peace and security in the global community. The Hague has an established role as an international city of peace and justice with many international diplomacy and international organizations. This makes it a logical location to house these activities (Meijers, 2013). Developing an innovative knowledge cluster will bring additional economic value to the city by creating high-skilled jobs and attracting companies.

### STRATEGY -

The Hague Security Delta was started in 2010 to be the centroid of the network of techies will increase tech-innovations and enhance collaboration. The further development of this area is essential for innovation and development of knowledge in the security sector. The core mission of this institution is to add an innovative sector to a local economy which is currently dominated by the public sector and large established companies (B&A, 2011). The Hague has throughout the past century developed a successful urban ecosystem for the public sector, international diplomacy and large commercial companies (B&A, 2011). However, it is also developing a successful typology for a technological innovative urban environment: with shared amenities, facilitating innovative start-ups, and designed according to the preferences of techies. Geneva is a president as a city combining international aid and foreign businesses in the city center. The spatial design of these cases showed the importance of regional complementarity, develop programmatic clusters in interaction environments, and to initiate the clustering in the current urban landscape.

### EXECUTIVE SUMMARY -

**INTRODUCTION -**

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**RELEVANCE**

- Technological advancement is rapidly changing the society, which causes a whole new range of security challenges. Many of these issues have a global reach, which makes it a challenge to solve strategically, innovations and development of knowledge in this area is crucial for peace and security in the global community. The Hague has an established role as an international city of peace and justice with many international diplomacy and international organizations. This makes it a logical location to house these activities (Meijers, 2013). Developing an innovative knowledge cluster will bring additional economic value to the city by creating high-skilled jobs and attracting companies.

**CHALLENGE –**

The security sector in The Hague was selected because it is an emerging sector which has not yet been studied properly from an urban design perspective. The economic potential of this sector is huge, however the sector needs a comprehensive urban strategy and design to be able to exploit this potential. The challenge is to create the specific spatial conditions for development into an innovative knowledge cluster, with new high-skilled jobs, to attract the sector and to align this development with the local community. The research provides understanding about the application of innovation theory.

**EXECUTIVE SUMMARY –**

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Urban strategy and design to develop the security sector in The Hague

Interaction environments with clusters of related program

World peace authorities
Intergovernmental institutions & conferences

Security innovation campus
Collaborative tech-R&D behind gates

Gateway to security city
Educational & public program

World Forum
Europol
OPCW
Yugoslavia tribunal
Hotel
Museum
TNONATO
ICC
MIVD AIVD
Frederikkezerne
Central facilities & amenities
Incubator
Business complex sports field

DESIGN PRINCIPLES

ALPHABETA
GAMMA

INTERACTION ENVIRONMENT

Top Secret Security Center in the former American Ambasscess

Exclusive international & security standards in the World Forum area

EXCLUSIVE INTERNATIONAL
INTERACTION
Implement innovations

COLLABORATIVE INNOVATION
BEHIND GATES
Create tech-innovations

CONNECT TO THE PUBLIC
Communicate innovations

BUSINESS SERVICES
Facilitate innovations

HIGH-END LEISURE
Attract key people

NATIONAL POLICY
Implement innovations

CORPORATE POLICY
Commercialize innovations

STRATEGY:
Complementary clusters

Specialized educational programs (MBO, HBO, university), student housing, large lecture rooms

Parcels available for corporate R&D departments, international security companies or semi-public institutions

Security innovation campus
Collaborative tech-R&D behind gates

Gateway to security city
Educational & public program

Professional educators, international key persons, and guests in order to spread the research and technological ideas displayed

The Hague Student Campus
Central location with shared facilities, lecture, representation rooms, business complex, technology labs, childcare

Central boulevard connecting the campus

International allure & security standards in the World Forum area

Renew the facade of the World Forum
Bilingual childcare amenities near the area

Singels around the area, to decrease required fences during large conferences

Redevelop buildings in the area for international organizations

SPACE FOR EXPANSION

Central boulevard connecting the campus

New entrance to Park Sorghvliet near the World Forum, and a pavilion with a tea house and meeting rooms

Central location with shared facilities, lecture, representation rooms, business complex, technology labs, childcare

International allure & security standards in the World Forum area

R&D campus for security professionals

Top Secret Security Center in the former American Ambasscess

Interaction environments with clusters of related program

World peace authorities
Intergovernmental institutions & conferences

Security innovation campus
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STRATEGY:
Complementary clusters

Specialized educational programs (MBO, HBO, university), student housing, large lecture rooms
Broader spatial conditions

This page explains flanking policy on broader spatial conditions, aiming to increase the international role of The Hague as a knowledge center. The urban strategy and design in The Hague must be explained on the previous page and the end of these broader conditions. These conditional interventions will vastly benefit the cluster, however the security sector is only one of the many reasons for these interventions. Accessibility, housing, and leisure are important to the development of a knowledge cluster. Knowledge workers are the main resource of an innovation cluster, and these people are very demanding (Florida, 2002). The starting point is to take advantage of regional development of a knowledge cluster. Knowledge workers are the main resource of an innovative cluster, of the many reasons for these interventions. Accessibility, housing and leisure are supportive to the conditional interventions will vastly benefit the cluster, however the security sector is only one role of The Hague in the knowledge economy. The urban strategy and design for the security cluster (as explained on the previous page) will be more successful on the soil of these broader conditions.

THE HAGUE IN THE DUTCH METROPOLIS: To order to create a knowledge cluster of international importance, both regional and international accessibility are key. Amsterdam and The Hague have complimentary international urban environments. These cities are strong players, however the city center of Amsterdam is currently more attractive than the city center of The Hague. The international airport in Rotterdam (Fig. 2) forms a combination of infrastructure that would improve this connection. The nearby airport is Schiphol, however a direct train to the airport in Rotterdam could increase the value of this second airport. The international airport in Schiphol is currently the second ranking airport in Europe, causing competition with the Rotterdam. The contribution of the Rotterdam airport and the A4 will reduce the pressure on this road.

THE HAGUE INTERNATIONAL CITY IN THE KNOWLEDGE ECONOMY - The region offers many complementary living environments at commuting distance: native supply of social housing typologies should be increased in The Hague. The middle segment of housing for key target groups is missing. This concerns short stay housing for expats (furnished apartments), and affordable housing for families (Furnished Studio). Room below €650, Buy below €170,000). Regional complementarity is the starting point Fig. 5: In The Hague the middle segment is missing for housing of key target groups. However supply of some complementary international urban environments. These cities are strong players, however the city center of Amsterdam is currently more attractive than the city center of Amsterdam.

INTERNATIONALISATION: Expats INNOVATION: Knowledge workers

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since much of this theory is aimed at understanding the current situation rather than finding ways to intervene. The selection of literature results from the selection process of theoretical research and design challenges encountered in the standardized case.

THEORETICAL FRAMEWORK: CLUSTER DEVELOPMENT FOR URBAN DESIGNERS

Overview and interpretation of theory, linking economic theory and spatial design

The theoretical research at the basis of the project is set out in a concise overview. The goal is to illustrate the spatial application of economic theory, to show the confluence of local and global trends, and to display the interaction of a city with its surroundings.

METROPOLITAN SPATIAL STRUCTURE & ECONOMIC PRODUCTIVITY

AGGLOMERATION ECONOMIES

The productivity of cities increases systematically with the size of the core city, while other areas remain (Florida, 2002). Businesses concentrate in certain successful places, while other areas slip behind (Florida, 2002; Sassen, 1991). A city size of economic success is a concentration of Bettencourt & West's (2010) agglomeration economies. In this way, agglomeration economies (Bettencourt & West, 2010) involve the division of labor, and the division of labor is fundamental for successful urban development (1973). However, smaller cities can be very successful when they find a certain specialization, which is based on the city's interconnected system of populations and agglomerations.

Kleiber's law about the metabolism of animals (Bettencourt & West, 2010)

Fig. 2: The productivity of cities increases systematically with the size, comparable to Kleiber's diagram about the metabolism rate of animals: bigger animals need more food than smaller animals.

The productivity of cities increases systematically with the size, for indicators like patents, income, GDP, GDP per capita, and even crime (Bettencourt & West, 2010).

AGGLOMERATION ECONOMIES

ECONOMIC THEORY - agglomeration economies

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THEORETICAL FRAMEWORK: CLUSTER DEVELOPMENT FOR URBAN DESIGNERS

INTRODUCTION - local buzz and global pipelines

Theoreticians are establishing a concept about how knowledge is created through the interaction between key people. The concept of the network society distinguishes places and flows (Castells, 1996). These flows can be physical connections between places, or relationships between people. However, there is also an increase in the size of cities (and urban areas) with the time. This phenomenon is explained by the concept of agglomeration economies. The benefits of locating near other firms are similar to Marshall's urbanization economies (1890). The Hague is a quite small city, which is itself not able to develop critical mass with a related variety of program in the world. However, this requires a regional strategy to develop critical mass with a related variety of program near each other. How to design urban areas to develop local buzz and global pipelines is a challenge for urban designers. The concept of the network society refers to a critical mass with a related variety of program near each other. Urban designers can design local buzz and global pipelines by creating an attractive location for a certain mix of program. Urbanization economies refers to a dense mixed-use area with shared facilities and amenities in central places (Florida, 2002).

Polycentric urban network

CRITICAL MASS

The spatial strategy for an agglomerated environment can be achieved by creating a critical mass of a related variety of program near each other. This can be achieved through design of a lively public space and amenities in the urban area (Sassen, 2002). These can be achieved through design of a network society.

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In the transition from the industrial society to the knowledge society the importance of face-to-face interactions is increasing, which demands for urban environments that facilitate interaction. It is stated that the location of the company or institution, in the current knowledge economy (Florida, 2002), determines which parts of the city are suitable. Large buildings of big organizations do not fit in historic parts of the city. Small innovative activities, like research and development and technology, however different businesses and organisations have other location preferences. Firstly the size of the organisation determines which parts of the city are suitable. Large organisations need more face-to-face contact, while small organisations can operate remotely. Secondly the geography of competition. “ Harvard business review 76(6): 77-90.

The Brookings Institution.

Fig. 7: Concentration of program in other cities than for instance their research and development activities (Duranton & Puga, 2005). Finally, location preferences depend on the personal preferences of different people: the impact is complicated.

**PEOPLE ALPHASHA BETA GAMMA**

The preference of different groups of people in an organisation is determining for the location of the company or institution. The knowledge economy (Florida, 2002). Knowledge workers can be divided in three groups: alpha, beta and gamma (Meijers, 2013). Alpha’s are people who are focused on symbolic interaction, like artists, designers and writers. Beta’s are people who are focused on symbiosis, like research and development and technology. Gamma’s work in complex, large companies. In these companies the managers figure their priorities and preferred location in the city.
Cities are the motor of the economy, and getting increasingly important for the socio-economic vitality of society (Glaeser, 2011; Hollis, 2013; Bettencourt & West, 2010). In the emerging globalized knowledge economy cities are becoming more and more interdependent (Raspe, 2011; van Winden, 2004). Some cities are able to find their position in this worldwide system, while others lose attractiveness. When cities get into a downward cycle of decline, this can have disastrous consequences, like in the cases of former industrial cities like Detroit (Dowell, 2000). In order for metropolitan areas to flourish in current times of globalization a focus on internationalization and on the knowledge economy are key (Raspe, 2011; van Winden, 2004). Larger metropolitan areas have agglomeration benefits of density and international connectivity that makes them naturally most successful in both the knowledge economy and internationalization. Smaller cities can be successful if they are able to find their specialization that suits the city and has a global relevance (Duranton & Puga, 2000). The spatial expression of such a specialization is visible as various types of clusters.

In The Netherlands the most internationalized places are Amsterdam and The Hague, in light of path dependency it is most promising to focus on these locations for the development of an international top quality. The Hague has a strong international position on the theme of peace and justice, which is rooted in historical events throughout the past centuries. However to flourish in the knowledge economy entrepreneurial activities on the crossroad of industry and university are very rewarding (Ezkowitz & Leydesdorff, 1997). The current focus in The Hague is very much on large public institutions (B&A consulting, 2011), while the entrepreneurial climate is weak compared to other successful metropolitan areas in the knowledge economy. An emerging commercial sector that is rapidly growing worldwide, and is related to the specialization of The Hague, is the security sector. The further development of the security cluster could take the international position of The Hague and The Netherlands to the next level (Meijers, Spaans, Louw, Hoogerbrugge & Priemus, 2013).

The main question of the project is: How can urban strategy and design contribute to the development of the security sector in The Hague into a knowledge cluster of international importance?

The security sector is a niche which is related to many different disciplines, ranging from IT and biotechnology to law and international relations. This results in a varied palette of companies and institutions, with very different demands on their urban environment. Therefore the worldwide work of this sector also has various different lifestyles with associated varied housing preferences. The Hague is only a medium-sized city, which is not able to provide all these urban environments by itself. It needs the amenities and urban environments of other cities and towns in the region as well, to complement what is present in The Hague (Meijers, Spaans, Louw, Hoogerbrugge & Priemus, 2013). The centroid of the cluster would be in The Hague, as the centre of a network of companies and city environments in different cities and towns in the region.

The design assignment is: What should the core of the security cluster in The Hague look like? How is it embedded in the urban fabric? Which parts of the cluster are where, and how can this still form a whole with critical mass?

Aims

The aim of the project is to establish a solid framework for an urban strategy through research, and develop an attractive design intervention that is key for this strategy. The initial aim of the research was to find an urban strategy that is relevant in the current socio-economic situation, and is beneficial for the international position of The Netherlands. This resulted in a focus on the development of a knowledge cluster in the security sector. The next step is to establish a solid academic theoretical framework through literature review on the topic, translating economic literature to spatial applications. This literature review is combining three topics: agglomeration power in a polycentric urban network, successful cities in the knowledge economy, and the spatial embedding of specialized knowledge clusters. The aim of this literature review is to gather and combine established knowledge to set a framework that is also relevant for other metropolitan areas and other knowledge clusters. The theoretical knowledge is combined with specific research of case studies, location analysis and analysis of the security sector, in order to set up a framework through research that leads to a solid, realistic and academically sound urban strategy.

The aim of the design intervention is to design a strategic element for the development of the security cluster in The Hague, showing how it could visually look like. The design goal is to make an attractive urban design that fits in the strategy but persuades through the image.
Methods

The project is composed of research, strategy and design. The research consists of four elements: literature review to establish a theoretical framework that is the basis of the urban strategy, the outline of a sector profile to find the required ingredients for a security cluster, a location analysis to find what is missing, and case studies to learn from best practices. Those four elements together lead to a set of problems that needs to be solved, and an urban strategy with spatial solutions to those problems. A crucial element of this strategy is elaborated into a design intervention. The theoretical research and the urban strategy are the starting point of the design process, and form an important input, but these can not provide theoretical underpinning of every decision in the design process. The literature review is mainly about the economical side of the project, while in the design other elements also play a role. Some additional academic underpinning is provided through the sector profile, which is partly based on academic literature. In the design process some decisions will also be based on visual preferences, or based on acquired knowledge about urban design from the previous projects in the education.

The urban strategy is divided in two main elements: firstly conditional spatial elements, and secondly the strategy for the cluster itself.

Fig 1: conceptual representation of the interconnected components of the clusters, on the soil of the right spatial preconditions.

Relevance

Societal relevance

The development of an international top quality will benefit the society as a whole, since the international position of the country has major impact on the socio-economic situation. The Planbureu voor de Leefomgeving has identified increased agglomeration power as a main priority for the coming time, and marked specialized knowledge clusters as a strategy that suits The Netherlands (Raspe, 2014). The Dutch government has a topsectorenbeleid since a few years, and the municipal council of The Hague has recently agreed to set focus on the further development of the security cluster, as a major economic opportunity for the city and the country. Besides the economic benefits, developing a knowledge cluster is the output of the sector of growing importance for both the Dutch society and the international community. Innovations and development of knowledge in this area are crucial, to respond to the rapidly changing technological and societal context.

Academic relevance

The project is on the crossroads of economy and urbanism, exploring the spatial translation of economic theory. Much of the research on cluster strategies, knowledge economy and agglomeration power lacks the spatial application. This is an emerging academic niche that needs to be developed to be able to implement the economic academic knowledge in the urban context.

Research questions

Main question:

How can urban strategy and design contribute to the development of the security sector in The Hague into an innovative knowledge cluster of international importance?

Theory:

a) How can specialized knowledge clusters increase the agglomeration power in the Dutch urban network?

b) How to generate agglomeration power in a network of medium-sized cities?

c) How to increase city competitiveness and productivity in the globalization knowledge economy?

d) How to embed a specialized knowledge cluster in the urban fabric?

Security sector profile:

What kind of city environments does a security cluster need?

a) Who works in the security sector and how do those people use the city?

b) Which types of companies and institutions are in the security sector, and how are they ideally located in the city?

c) Which amenities does the security sector need to facilitate forming a local community and global relationships?

Location analysis:

What is currently happening in The Hague related to the security sector and the international zone?

Case studies:

a) How do clusters emerge in a certain location, and how does the cluster impact the place? - Silicon valley, peace palace, DHV valley

b) What does public space look like in a good international quarter? - Geneva

c) How big are the conferences and international gatherings in the security sector and what kind of amenities do they use? - Nuclear Security Summit, Washington cybersecurity event, international fair in Paris, The Hague Security Delta events

Design assignment:

What should the core of the security cluster in The Hague look like? How is it embedded in the urban fabric? Which parts of the cluster are where, and how can this still form a whole with critical mass?
PART 1 Competitive position of The Hague

INTRODUCTION
The graduation project consists of three parts: first the competitive position of The Hague, second the conditional spatial aspects, and third the urban strategy for the development of the security cluster. The first part is aimed at understanding how the competitive position of The Hague can be improved, in order to both increase the socio-economic position for the inhabitants and improve the role of the city in the world. The Hague has a strong position as international city of peace and justice, so finding a related cluster to expand this specialization would increase the socio-economic situation of the city and serve the global community in establishing world peace. In order to understand how urban strategy can contribute to strengthening the economic activities in a city different research methods are combined. The first section is a literature review to find the established knowledge about the spatial aspects of economic theory. The second section is a location analysis to establish a city profile, of the global position of the city, the role of the city in a complementary region, and the potential in the knowledge economy and the current cluster dynamics in The Hague. Those two sections resulted in the strategic choice to focus on the security sector: developing an knowledge cluster with technical innovations in the area of security will be very beneficial for The Hague as city of international peace and justice. In the third section is analyzed what the initial elements are of the security sector that currently already are in The Hague. Finally in some case studies the city is compared to cities with a similar role in the global system, and secondly a case study of a recent large international event in the security sector shows the scope of the region that is relevant for an international cluster in The Hague. The outcome of this first part of the project is the foundation for the urban strategy.
1.1 Theoretical Framework

This section is a literature review, to find the established knowledge about the project. It is written in the form of a paper, after this follows another section with further elaboration on the part about clusters, which connects the theory of the paper to the graduation project.

Abstract – Cities are becoming increasingly interdependent, and competing with each other to attract people and businesses (Hollis, 2013; Oswalt 2006; van Winden, 2004). Metropolitan regions are the motor of the knowledge economy, the breeding place of innovations, where development accelerates. Some cities are able to find their position in this worldwide system, while others lose attractiveness. The main theme of this essay is how such a knowledge cluster is spatially embedded, to create an environment for innovations and the exchange of knowledge.

Key words – urban strategy, competitive cities, metropolitan scale, knowledge economy, cluster

1 Introduction

Throughout history the process of urbanisation is ongoing, since cities are able to offer something that cannot be found in the countryside. People move from villages to towns and from towns to cities to find new economic opportunities. Cities are the places where innovation breeds, where development accelerates and they are the motor of the economy (Hollis, 2013; van Winden, 2004). When people come together in cities, they become more productive because there can be a division of labour, which in economic terms equals progress (Smith, 1776). In what is considered the first theoretical treatise of urbanism, Heinrich Baumeister already states that economic success is the legitimacy of a city. Published in 1876, it states that the only acceptable basis for a city is sound, industrial economy, and in his work he describes how the municipality should deal with growth and expansion (Wagenaar, 2011). Cases of cities when economic growth stagnates like Detroit show that this can cause a downward cycle which is disastrous for the city dynamics. Amenities have to close and people move away to other places (Dawid 2006). Nowadays the success of a city has much to do with its relative position to other cities. In the globalizing knowledge economy the world wide system is becoming increasingly connected, and cities are getting more interdependent (Oswalt, 2006; van Winden, 2004).

The aim of this essay is to find how an urban network of medium-sized cities can develop a distinctive role in the globalized knowledge economy. This is done by means of a literature review, by combining different studies and theories on economic success in cities. Much of these studies are done by economists, this essay highlights the spatial elements in those studies that are relevant for an urban planner. The first part deals with agglomeration power and scale advantages, to find how a polycentric network of medium-sized cities can compete with mega cities. The second part is about the current influence of the rise of the knowledge economy, and what this means for a city of moderate size in the worldwide interconnected system. How to implement the conclusion of the second part is elaborated in the third part, which deals with how a specialized knowledge cluster is spatially embedded in the urban fabric. The outcome of this essay is

1.1 Theoretical Framework

Moderate size, distinctive global role

Specialized knowledge clusters as an urban strategy in the globalized knowledge economy for a metropolitan region of medium-sized cities

2 Agglomeration power and urban scale advantages

Each city is different, and has a unique history, geographical location and a different urban design. Studies about the success of an individual city often relate to some of these unique characteristics, pointing to those as the reason for success. However important those things are for the story of that specific city, there seems to be a trend when sorting the cities by population size. In this section will be studied how city scale and location next to other cities is related to economic success. Theories of different writers are combined to find what this means for a medium-sized city in a polycentric urban network. First the evidence for the scale advantages will be discussed, than this will be explained with theoretical economic principles. This will be extended with a case study on how the Netherlands has structured the success of polycentric regions, to understand how scale advantages work in an urban network.

2.1 City size

Strong empirical proof for the scale advantages of cities is found by Geoffrey West. He is a theoretical physicist who was determined to find the rules governing the complexity of the city. He studied the characteristics of many cities, looking for mathematical rules that apply to all those unique cities. Inspired by Kiihler’s diagram from the 1950s he started looking for the relationship between the size of cities and its characteristics.
produces and consumes, whether goods, resources or ideas. On average, as the city increases, per capita economic quantities such as wages, GDP, number of patents produced and number of educational opportunities are born and die more often, and people even walk faster in larger cities. The pace of all socio-economic activity accelerates, and becomes more interdependent, resulting in new forms of economic specialization and cultural expression. West looked for the mathematical relationship between size of the city and indicators like productivity, wages, GDP, number of patents and number of educational opportunities. It is not a linear relationship, when the body mass of an animal increases, with a factor of 75%. Kleiber’s diagram shows that for the vast majority of animals the body mass of an animal increases, with a factor of 75% (Hollis, 2013). The bigger the city, the more the average citizen owns, (Bettencourt & West, 2010). The bigger the city, the more the average citizen owns, when the body mass of an animal increases, with a factor of 75% (Hollis, 2013). West applied this to cities, and found that the size of the city is the major determinant of the character of a city. This idea has appeared in theorems before, now only it has been empirically proven. West analysed a large set of data about urban centres in regions and countries all over the world, from the United States and Europe to China and Brazil, and presented his Unified theory of urban living. Already in 1890 Alfred Marshall described some theoretical principles that explain why bigger cities do better than smaller ones. They are referred to as Marshall’s scale laws, describing how this mechanism of economic benefits in agglomerations works (Henderson, 2003). There are two main forms of agglomeration economies: localisation economies and urbanisation economies. Both describe how economic productivity is related to the spatial distribution of business activities, one economy refers to the concentration of the same industry, the other to diversification. Localisation economies is the concept that explains how firms within the same industry benefit from locating close to each other, leading to productivity gains through for example knowledge spillovers and the enhancement of shared specialized labour pools. This is an argument for specialisation of space if the returns to scale are high. Urbanisation economies refer to the advantages of locating in a more diversified urban area, also leading to a higher degree of emergence and the generation of new activities. Alonso’s idea of local diversification and mixing has been clearly described by Jane Jacobs (1969), and the concept of urbanisation economies is still referred to as Jacobs economies (Henderson, 2003). Much research has been done on this topic of specialisation versus diversification, to understand how these concepts apply in different industries, and how those mechanisms apply in either bigger or smaller cities. Further on it is important to understand more on how to work with those concepts as an urban planner.

### 2.3 Borrowed size

Marshall scale laws are the theoretical backing of what West proved empirically: that the productivity of a city increases when it grows. However some small cities over perform according to their population number, like those in the urban patterns of The Netherlands and Germany. Almeida explained this in 1973 with his concept of borrowed size, whereby a small city or metropolitan area exhibits some of the characteristics of a larger one if it is near other population concentrations. His concept is based on the opportunities for interaction in a place, whereby more opportunities for interaction lead to higher economic productivity. Bigger cities have a higher population number, and thus more opportunities for interaction than smaller cities. However in the case of a small city in a metropolitan area with many other cities, the population number of the city itself can be low, while the number of opportunities for interaction is much higher. Therefore people that live in such a small city can use the shopping and entertainment facilities of the other cities to complement their own, and businesses can share facilities and services, and the labour market has a wider and more flexible range of demand and supply. This number of opportunities for interaction Almeida calls population potential, which is an index for borrowed size. In the theory of economic productivity in size, it is thus important to include in some degree close by cities.

### 2.4 Polycentric urban network

Majumder (2013) goes one step further demonstrating that a polycentric urban region performs even better than a monocentric urban region of similar size. Labour productivity is 15% higher and wages are 5% higher, when a range of other explanatory factors is controlled for. This is remarkable, because it is contrary to both concepts of localisation economies and urbanisation economies. There is on average less proximity advantages in polycentric regions, and also less diversity, because competition between urban cores tends to lead to duplication rather than complementarity. The most likely explanation
3 Successful cities in the globalized knowledge economy

While the recommendations of the previous section on scale and spatial structure apply throughout time, cases of shrinking cities like Detroit show that the success of a city is also related to the socio-economic changes that society undergoes. The once thriving city now got into a downward cycle, because it could not keep up with the changing economic situation (Oswalt, 2006). It is thus essential for a city to adapt to the current socio-economic situation, and pick up economic activities that suit this time and place. The presence of the knowledge economy is having a major impact on the socio-economic balance of cities, because knowledge intensive activities do very well (van Winden, 2004). In this part, one is explored how smaller cities can compete with large metropolitan areas, but there are areas outside the megacities that are able to become a knowledge centre. For some sectors the absence of crowding out wages the less diversified urban economy.

3.2 Knowledge workers

In order for a city to specialize in some knowledge intensive industry, the city needs to attract businesses and people that work in this sector. Florida (2002) states that the way to become a knowledge city is to focus on attracting people rather than businesses. Those knowledge workers are very mobile and can easily go somewhere else if the quality of life is lower. The kind of city environment that attracts this group is vibrant, has good amenities and nice neighborhoods. However the group of knowledge workers is not a homogenous group. Florida differentiates in bohemians and artists, and the two groups of people are creative, sensitive towards historical buildings and a culturally inspiring environment, while nerds are knowledge workers who are more pragmatic towards the build environment, and appreciate comfortable service like good parking facilities and accessibility. This means that an urban planner needs to assess precisely which kind of people work in the aimed sector, and what their specific wishes and demands are.

3.3 Foundations of the knowledge city

There are certain characteristics of cities that do well in the knowledge ranks. In his book The learning region (2004) calls these the foundations of the knowledge city, that need to be present to create the possibility for knowledge intensive activities. Be mentions seven foundation stones: knowledge base, economic base, quality of life, accessibility, urban diversity, global scale and social equity.

The first foundation, knowledge base, is similar to Florida's (2002) notion about the presence of knowledge workers. Next to knowledge workers the presence of universities and research institutes is also crucial. The second foundation, economic base, states that urban regions with an economy dominated by service activities have a stronger position in the new global knowledge economy than the traditional manufacturing and port industries. Diversified economies are also more resilient and a better incubation place for innovation, which relates to Jane Jacob's urbanisation economy theory (1969). The third foundation, quality of life, is similar to Florida's theory (2002) on how to attract knowledge workers: attractive built environment, high-quality houses, attractive city parks and natural surroundings, a rich variety of cultural institutions, and good amenities such as international schools. The fourth foundation, accessibility, is based on the notion that the knowledge economy is a global network economy, so good international and regional connectivity is crucial. Van Winden also mentions the building places for global conferences, which will be elaborated further in paragraph 4.3 based on Bathelt's theory (2004) on clusters. The fifth foundation, urban diversity, relates to...
1.1 Theoretical framework

4 Specialized knowledge clusters

With the rise of the knowledge economy, innovations and the creation of new knowledge has become very rewarding (Baum, 2014; van Winden, 2014). Regions that are able to create an innovative environment become very successful, like Silicon Valley in California (Hall, 1998). Economic activities tend to cluster spatially, and most of all globally internationally. Bathelt (2004) states that a region needs to be specialized in an innovative sector. This section deals with the question what are the essential spatial features of an innovative cluster. Wolfe and Gettler (2003) recapitulate the growing body of literature on clusters in three main themes: path dependence, the nature of knowledge and learning, and the broader context.

3.4 Conclusion

Six foundations of clusters have been extensively discussed in the first section of this essay. The seventh foundation, social equity, is more a problem of comparison between the countries and cities, and which different cluster typologies there are for different sectors. Technological firms tend to cluster in techparks on the outskirts of the big cities, while creative companies locate in incubators with related enterprises.

The knowledge economy is very much a global economy, in which knowledge workers around the world learn from each other. A cluster cannot be isolated apart from relationships with other knowledge hubs. Bathelt (2004) identifies the problem with global knowledge flows as follows: even though it might be codified knowledge, in reality there is still substantial costs associated with identifying, assessing, assimilating and applying this knowledge, to use it. So people need to meet each other face-to-face, to establish relationships through which knowledge can transfer. Through regular events and conferences relationships are established with other companies, and in the local environment it is very rewarding for a company to be part of a local cluster (Bathelt, 2004).

4.2 Local dynamics

A cluster cannot just be made anywhere, they emerge at a location for a reason even companies try to create local buzz around them, which is obviously not possible in many of those cases (Duranton & Puga, 2000). The knowledge economy is so very much related to the extent to which cities are able to attract knowledge workers (Florida, 2002). The city needs to offer high quality environment because those people are very mobile and can go to any city that offers a high quality environment for the knowledge economy (Raspe, 2014; van Winden, 2011). The city, the state and the region to be specialized in an innovative sector. This section deals with the question what are essential spatial features of such an innovative cluster. Wolfe and Gettler (2003) recapitulate the growing body of literature on clusters in three main themes: path dependence, the nature of knowledge and learning, and the broader context.

3.4 Conclusion

Six foundations of clusters have been extensively discussed in the first section of this essay. The seventh foundation, social equity, is more a problem of comparison between the countries and cities, and which different cluster typologies there are for different sectors. Technological firms tend to cluster in techparks on the outskirts of the big cities, while creative companies locate in incubators with related enterprises. Those innovative start-ups benefit much from locating in an incubator with related enterprises. The ideal location of a knowledge cluster also varies for different sectors. Technological firms tend to cluster in technoparks on greenfield locations at the edges of the city, while creative companies rather locate close to each other in a dense urban environment. Van Winden (2011) differentiates seven different types of knowledge hotspots, and organizes them along two axes: mixed-use or mono-functional and urban or greenfield.
4 Conclusion

A knowledge cluster needs both local dynamics and global linkages. Locally there needs to be a critical mass of a related variety of companies and institutions, and the urban context needs to offer interaction environments for the exchange of knowledge. Those range from incubators for start-ups to third places in public space. Global linkages can be facilitated through conference centres and event halls.

The location of knowledge clusters of different sectors varies, since the demands to the type of city environment differs between large and small companies, and between different disciplines.

5 Conclusions

The main question of this essay is: how can an urban network of medium-sized cities develop a distinctive role the globalized knowledge economy? The city size is related to the context of the emerging globalized knowledge economy. Some cities that used to do very well in the industrial age now lost attractiveness and got into a downward cycle of shrinkage, because they could not keep up with the changed demands of the information age (Oswalt, 2006). Larger metropolitan areas are naturally a good urban environment for the knowledge economy. The city needs to offer a high quality environment because those people operating in the knowledge economy are very mobile and can easily move somewhere else. Other cities can compete.

The city size determines the agglomeration power when the city is in a metropolitan area with other urban cores: cities can borrow size from each other (Alonso, 1973). Polycentric urban regions perform even better (Raspe, 2014; van Winden, 2004), while smaller cities need to specialize in a niche to be able to play a role in the worldwide interconnected system (Duranut & Puga, 2000). In the knowledge economy, the city size is related to the context of the emerging globalized knowledge economy. A knowledge cluster needs both local dynamics and global linkages. Locally there needs to be a critical mass of a related variety of companies and institutions, and the urban context needs to offer interaction environments for the exchange of knowledge. Those range from incubators for start-ups to third places in public space. Global linkages can be facilitated through conference centres and event halls.

In conclusion specialized knowledge clusters are an urban strategy that provide the way for medium-sized cities to be competitive in the globalized knowledge economy. With different specialized clusters fitting the different urban cores, a metropolitan area of medium-sized cities can become a complementing whole with scale advantages. Advertisers operating in a knowledge intensive niche are most advantageous in the knowledge economy, together those urban cores can offer the amenities and urban environments to meet the high standards of knowledge workers.
conclusions are not detailed enough to be directly applicable for the design part. Many more elements have to be considered to translate the recommendations into an urban design, since there are many more determinants of a successful urban space. However the recommendations can add a focus to an urban design that makes a difference for the economic success of the city.

Another key issue is what determines critical mass, whether this means companies within the cluster, thus the productivity of the city systematically increases with the urban density of companies within the sector. Relationships with companies outside those interaction environments can be viewed as pipelines, since maintaining those interaction environments, or through people or projects on the crossroads of those fields, whether those actors are spatially close to each other or only relationally. The relation between those clusters of different sectors can be facilitated through spatial closeness and shared interaction environments, or through people or projects on the crossroads of those fields, whether those actors are spatially close to each other or only relationally. Global pipelines are relationships around the world with people who do similar work (Bathelt, 2004). The time and effort to intentionally maintain such relationships limits the amount of pipelines. Conventions and international events and communications can facilitate relationships, because they create a temporary local buzz in which it is much easier to estimate who is around each building, which block the local buzz. An open urban structure means to not have fences and gates and energy. An open urban structure means to not have fences and gates around each building, which block the local buzz. Another key issue is what determines critical mass, whether this means companies within the cluster, thus the productivity of the city systematically increases with the urban density of companies within the sector. Relationships with companies outside those interaction environments can be viewed as pipelines, since maintaining those interaction environments, or through people or projects on the crossroads of those fields, whether those actors are spatially close to each other or only relationally. The relation between those clusters of different sectors can be facilitated through spatial closeness and shared interaction environments, or through people or projects on the crossroads of those fields, whether those actors are spatially close to each other or only relationally.

**References**


Further elaboration on cluster theory

**Cluster dynamics: creating local buzz and global pipelines**

Local buzz is the word Bathelt (2004) uses to describe the local dynamics in a cluster that stimulate innovation and the creation of new knowledge. There needs to be a critical mass with a related variety of companies and institutions. In order to create such dynamics the companies and institutions in the area need common facilities, an open urban structure and interaction environments. Common or shared facilities enable people to meet other people without intending to do so. This is the main advantage of local buzz to enable relationships or see what others do without the intentional effort of maintaining the relationship, that costs much time and energy. An open urban structure means to not have fences and gates and energy. An open urban structure means to not have fences and gates around each building, which block the local buzz. Another key issue is what determines critical mass, whether this means companies within the cluster, thus the productivity of the city systematically increases with the urban density of companies within the sector. Relationships with companies outside those interaction environments can be viewed as pipelines, since maintaining those interaction environments, or through people or projects on the crossroads of those fields, whether those actors are spatially close to each other or only relationally.

Another key issue is what determines critical mass, whether this means companies within the same sector or companies in different sectors can also contribute to the critical mass. Local buzz is the word Bathelt (2004) uses to describe the local dynamics in a cluster that stimulate innovation and the creation of new knowledge. There needs to be a critical mass with a related variety of companies and institutions. In order to create such dynamics the companies and institutions in the area need common facilities, an open urban structure and interaction environments. Common or shared facilities enable people to meet other people without intending to do so. This is the main advantage of local buzz to enable relationships or see what others do without the intentional effort of maintaining the relationship, that costs much time and energy. An open urban structure means to not have fences and gates and energy. An open urban structure means to not have fences and gates around each building, which block the local buzz. Another key issue is what determines critical mass, whether this means companies within the cluster, thus the productivity of the city systematically increases with the urban density of companies within the sector. Relationships with companies outside those interaction environments can be viewed as pipelines, since maintaining those interaction environments, or through people or projects on the crossroads of those fields, whether those actors are spatially close to each other or only relationally.
1.2 City profile of The Hague

GLOBAL POSITION

In these times of increased globalisation the international competitive positions of a city are gaining importance. It is key for the socio-economic vitality of the city. In the emerging globalised knowledge economy cities are becoming more and more interdependent (Raspe, 2011; van Winden, 2004). Some cities are able to find their position in this world wide system, while others lose attractiveness. When cities get into a downward spiral, this can have disastrous consequences, like in the cases of former industrial cities like Detroit (Oswalt, 2006). In order for metropolitan areas to flourish in current times of globalisation a focus on internationalisation and on the knowledge economy are key (Raspe, 2011; van Winden, 2004). Larger metropolitan areas have agglomeration benefits of density and international connectivity that makes them naturally most successful in both the knowledge economy and internationalisation. Smaller cities can be successful if they are able to find their specialisation that suits the city and has a global relevance (Duranton & Puga, 2000). The spatial expression of such a specialisation is visible as various types of clusters.

In The Netherlands the most internationalized places are Amsterdam and The Hague. In light of path dependency it is most promising to focus on these locations for the development of an international top quality. The Hague has a strong international position on the theme of peace and justice, which is rooted in historical events throughout the past centuries. However to flourish in the knowledge economy entrepreneurial activities on the crossroads of industry and university are very rewarding (Ezkowitz & Leydesdorff, 1997). The current focus in The Hague is very much on large public institutions (B&A consulting, 2011), while the entrepreneurial climate is weak compared to other successful metropolitan areas in the knowledge economy. An emerging commercial sector that is rapidly growing worldwide, and is related to the specialisation of The Hague, is the security sector. The further development of the security cluster could take the international position of The Hague and The Netherlands to the next level (Meijers, Spaans, Louw, Hoogerbrugge & Priemus, 2013).

REGIONAL COMPLEMENTARITY

The Hague is a medium-sized city that needs the other cities in the region to benefit from metropolitan scale advantages. In order to become an integrated whole, the spatial dynamics of the cities should complement each other, instead of competing for the same functions. The Hague needs to be connected to the knowledge base of Leiden, Delft and Rotterdam, since those cities have good universities that are incomparable in scale to the knowledge institutions in The Hague. Amsterdam has some high-end cultural facilities that cannot be made in another city within the Netherlands, since the metropolitan region as a whole does not need these double. Besides facilities Amsterdam also offers a living environment that is more urban than in The Hague, and has an unique attractiveness that is different from The Hague. The same goes for smaller towns in the region that offer a different kind of environment that is complementary to the metropolitan region as a whole. The Hague has most international institutions, embassies and government related functions, and is an international centre of peace and justice. New program related to those qualities would benefit from locating in The Hague compared to locating in other cities in the region.

Interaction environments

The Hague: mixed metropolitan cluster

Leiden: knowledge cluster

Delft: knowledge cluster

Rotterdam: mixed metropolitan cluster


data origin: M de Hoog (2013)

The year of Detroit illustrates the consequences of a changing global position of the city. In this large city of the automotive industry, a decreased spatial after the industries moved to other parts of the world.

1.2 CITY PROFILE
Foundations of the knowledge city

In this section The Hague will be assessed based on the foundation stones for a thriving knowledge economy. Van Winden (2004) mentions seven aspects that are the foundation of the knowledge city.

Knowledge base

The Hague does not have an own university within the municipality borders, which is remarkable for a city of its kind. However in the region there are three top universities very close by: the Leiden University, the Technical University of Delft and the Erasmus University Rotterdam. Those universities can be consid- ered the knowledge base of The Hague, together with the Hague Hogeschool and other educational institutions in the region. Besides institutions an im- portant aspect of the knowledge base is the presence of knowledge workers. Florida (2002) refers to these people as the creative class, people who discover new things, by combing elements in a new way. The Hague has a large group of very well educated people who live in the city, some who work in other cities like Rotterdam.

Economic base

The Hague has a strong focus on the public sector, compared to the rest of the country and compared to the other section within the city. Only half the jobs in The Hague are in the market place, while in the rest of the country almost all the jobs are in the market place. Non-commercial institutions have a much larger share of the jobs in The Hague. Another remarkable difference is the size of the companies and institutions in The Hague. A large part of the jobs are in big companies and big institutions compared to the rest of the country: the share of jobs in companies with between 10 and 99 employees is much lower than in the rest of The Netherlands. The Beatrixkwartier is the second ranked office location of the Netherlands, and many large companies have their headquarters here.


Source: van Winden (2004); p.14

The Hague has bigger share of large companies compared to
the rest of The Netherlands, and a strong focus on the public sector.

Quality of Life
The quality of life in The Hague is considered very good, especially in the wealthier part of the city. There is lots of green, the sea and the dunes are close by. Considering the ambition of the city to be the international centre of justice and peace, it needs to offer enough housing facilities for expats as well. The Hague has some good international schools, and other amenities for expats. The province of South-Holland analysed that their main housing shortages are in The Hague: short term housing for expats and affordable houses for starters. Short term housing means facilities in between hotels and the rental apartments that are currently available. Those should be furnished studios, that can be rented for a period of a few months, for a reasonable price. Affordable housing for starters means rent below €550 euro per month, or to buy for less than €750/000 euro. In the larger region affordable housing can be found in for instance Rotterdam, which makes it a more attractive city for starters to go live in. And for instance Zoetermeer complements The Hague by offering suburban houses with a much lower price per square meter.

Accessibility
The Hague is conveniently located close to cities like Amsterdam and Rotterdam, however its accessibility is not ideal. For international connectivity Schiphol airport is a top quality airport, with many international destinations. However The Hague lacks a fast public transport connection to Rotterdam-The Hague airport. This smaller airport could be a business airport, if the holiday flights of airlines like Transavia would be relocated to Lelystad or Eindhoven. Rotterdam-The Hague airport is very weakly connected to public transport, but also the international zone needs better connection to The Hague central train station. This is currently under construction, so it should be better soon. By car The Hague is located next to good highways, however, those are all on the eastern side of the city, since it is a coastal city. Mainly the entrance from the highway into the city is a bottleneck. Improvements to this problem are planned by constructing the Rotterdamse Baan and improving some other roads.

Urban Diversity
The Hague has a multicultural population with immigrants and expats from all over the world. However in the area of entrepreneurship the city could benefit from more diversity. The economy is based on a major focus on large public institutions and large companies. There are some creative enterprises in The Hague: Bink36 and Caballero Fabriek.

Incubators with creative enterprises in The Hague: Bink36 and Caballero Fabriek

Urban Scale
Within the municipality borders The Hague is only a medium-sized city, and it would lack urban scale to support high-end metropolitan functions. However when seen in the context of the region, the metropolitan area as a whole has a decent urban scale to support functions like the security cluster. As stated in the theory this polycentric structure has many advantages, when the different cities complement each other.

Social Equity
In the city of The Hague there is a sharp distinction between where the fortunate and less fortunate people live. Historically the rich live on the sandy grounds, and the poor on the peatland. However The Netherlands has a strong welfare state, which still provides good arrangements for less wealthy people. So even though the Schiphol area has a reputation as one of the most deprived areas, the problems are still incomparable to deprived areas in other metropolitan areas like Los Angeles or Paris.
As described in the theory on page , a cluster needs critical mass and interaction environments. Now will be analysed where those are in the region of The Hague.

Critical mass
Anke Wetzel analysed for the deltametropole association where innovative companies are located in the province of South-Holland (2013). Being near related innovative companies is beneficial for the company and the cluster as a whole. The maps show companies in the main innovative sectors in South-Holland, being ICT (red), Lifescience&Health (purple), Water&Deltatech (blue), Greenports (green), and logistics (yellow). Of those sectors mainly ICT is relevant for the security sector, and to a lesser extent Lifescience&Health and water&deltatech. ICT is very relevant to all the branches of the security sector: national security, cyber security, critical infrastructure, urban security and forensics. Lifescience is closely related to forensics, and to a lesser degree to critical infrastructure, for example for water safety and poisoning problems. Water&deltatech is relevant for both national security and critical Infrastructures, since for example drinking water is an element of critical infrastructure.

Wetzel (2013) states that a certain type of companies is especially important for clusters, called gazelles. Those are companies that have been started more than 5 years ago, had less than 5 employees in their start-up year and more than 10 employees after 5 years. Gazelles are the engines behind the formation and growth of sectors. High-tech clusters are said to nurture, attract and retain these entrepreneurial firms thanks to the knowledge networks and resources they provide. Their location choice is an indicator of the success of high-tech clusters.

Map 1 shows that many ICT companies are located along the axes connecting The Hague, Rijswijk and Delft, and also Zoetermeer and Rotterdam have a decent critical mass in this sector. Map 2 shows that the biggest cluster of ICT gazelles is in the centre of Rotterdam, while The Hague, Delft, Rijswijk and Zoetermeer also have groups of ICT gazelles. The mass of innovative companies and gazelles in the other two sectors are much smaller compared to ICT. The Lifescience&Health sector is mainly clustered in Leiden, both in total amount of companies and the amount of gazelles. The water&deltatech sector companies are mostly located in Rotterdam, Dordrecht and Gouderak along the river. Gazelles in the water sector are located in Rotterdam en Dordrecht, and some in Leiden.

Map 3 zooms in on the location of the company clusters, red dots are ICT clusters. Those are mainly located in the northern part of The Hague, the northern part of Rijswijk, the South-eastern part of Delft, the centre of Zoetermeer, and in Rotterdam around the university campus Woudestein.

ICT-companies tend to cluster in urban inner city locations, while Lifescience&Health are located in highly specialised research park locations. Greenports clusters are found in the more rural/peripheral areas: the greenhouse locations. Water&deltatech companies cluster around the port and water driven areas, and the logistics sector is located at the warehouse areas at the belt of cities and urban areas.
CITY PROFILE: INTERACTION ENVIRONMENTS

Next to critical mass a cluster also needs interaction environments to create local buzz. A cluster can be created as an independent campus on a greenfield location, or embedded in the existing urban fabric. In this paragraph the options for embedding in the existing urban fabric will be explored. The Hague has two main interaction environments: one in the city centre and one in the international zone. In the city centre the ministries are clustered, mixed with some cultural amenities and next to the main shopping centre of the city. In the international zone some major international institutions are mixed with some cultural amenities and a large conference centre, the World Forum. This area is now under construction for improved public space, like the drawing below. The concept is peace and justice in the dunes, so the plantation is dune grass with trees and flowers that grow in a dune landscape, and the street furniture matches this kind of landscape. With this new design the public space made a big improvement on facilitating an interaction environment.

For the security sector both those interaction environments could be suitable. The Hague Security Delta has the intention to use the international zone as a living lab, in the sense that they can try out innovative ways of securing the international institutions. This could be a location the security sector could use, in new ways to combine public space and security. The city centre could also be a good location for the security sector to mingle with other clusters, since this is also an area that is very well connected to the region by public transport. The security sector might need to be in close collaboration with clusters in other cities, good connectivity could be very useful.

Conference locations in the Randstad. International events are particularly important for the establishment of global pipelines. Source: de Hoog (2013)

New public space design for the international zone. Source: de Hoog (2013)

Assembled map of The Hague, base layer: Interaction environments as identified by Maurits de Hoog, combined with the international organisations in The Hague (orange) and office areas (blue).
1.3 Current sector security in The Hague

The aim of this chapter is to make a profile of the sector security, as it currently is in The Hague. The first part is about the variety of businesses and institutions that together make up this sector, and what kind of city environment each of them needs. The second part elaborates on the people and institutions that together make up this sector, and what kind of city environment each of them needs. The third part is an overview which facilities are needed, and which features those facilities need to have.

There is a large variety of companies and institutions that are related to the security sector, ranging from technological start-ups to big commercial companies to technological start-ups. Those companies and institutions are of a very different nature, and those features each of them need is determined by what has been defined as the main priorities by The Hague Security Delta, a project that has been started in 2012. This project is the early beginning of the development of a cluster, currently a group of existing companies and institutions that have committed to work together to develop into an innovative knowledge cluster. It responds to the launch of the Topsectorenbeleid by the Dutch government in 2010, defining which sectors are promising to be seen that the biggest cluster is in The Hague, and the large map shows where in The Hague this cluster is located. Currently 197 companies and institutions are connected to HSD, the goal of HSD is to stimulate innovation in security and economic development. According to the triple helix theory the security sector needs both knowledge institutions and commercial companies to technological start-ups. Those companies and institutions operate in different fields, with critical elements in the city for this sector.

On the scale of The Netherlands can be seen that most partners of HSD are in the Randstad, but there are some in the eastern and southern part as well. On scale of The Hague it shows where in The Hague this cluster is located. Currently 197 companies and institutions are connected to HSD, the goal of HSD is to stimulate innovation in security and economic development. The strategy is to stimulate cooperation between businesses, government and knowledge institutions. The aim of this chapter is to make a profile of the sector security, as it currently is in The Hague. The first part is about the variety of businesses and institutions that together make up this sector, and what kind of city environment each of them needs. The second part elaborates on the people and institutions that together make up this sector, and what kind of city environment each of them needs. The third part is an overview which facilities are needed, and which features those facilities need to have.

Companies and institutions

There is a large variety of companies and institutions that are related to the security sector, ranging from technological start-ups to big commercial companies to technological start-ups. Those companies and institutions are of a very different nature, and those features each of them need is determined by what has been defined as the main priorities by The Hague Security Delta, a project that has been started in 2012. This project is the early beginning of the development of a cluster, currently a group of existing companies and institutions that have committed to work together to develop into an innovative knowledge cluster. It responds to the launch of the Topsectorenbeleid by the Dutch government in 2010, defining which sectors are promising to be seen that the biggest cluster is in The Hague, and the large map shows where in The Hague this cluster is located. Currently 197 companies and institutions are connected to HSD, the goal of HSD is to stimulate innovation in security and economic development. According to the triple helix theory the security sector needs both knowledge institutions and commercial companies to technological start-ups. Those companies and institutions operate in different fields, with critical elements in the city for this sector.

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1.3 CURRENT SECURITY SECTOR

This results in a variety of urban environment preferences, both for working and living. The workforce consists of higher and lower educated people. According to the theory of the multiplier effect of innovative jobs, every new job at the top of the pyramid also creates a certain amount of jobs lower in the pyramid, in lower educated service jobs. However the focus in this section is mainly on the top of the pyramid, since the emergence of the cluster depends more on them. Lower educated service jobs are easier to fill in with the people of the local community. This does not mean that the goal is to have the entire top of the pyramid living inside the municipality borders of The Hague, since higher educated people tend to be more mobile than lower educated people. Especially for business purposes this group travels bigger distances. So it will comply when the desired living environments can be found in the region of The Hague.

The top of the pyramid of a knowledge cluster consists of mainly higher educated knowledge workers. Those people are very demanding to the quality of the urban environment, since they are very mobile and can easily go somewhere else if the quality of life is higher there. The kind of city environment that attracts this group is vibrant, has good amenities and nice recreational green. Florida (2002) calls them the creative class, and divides in bohemians and nerds. Bohemians are creative people, who are sensitive to an inspiring diverse urban environment, with high-end cultural amenities, located for instance in historic parts of the city. Nerds are more pragmatic towards their environment, preferring comfortable amenities like easy parking and accessibility. The security sector will have a larger share of nerds than bohemians, since the sector is less related to culture and arts.

A cluster aiming for innovative start-ups has to attract high educated people with an entrepreneurial spirit. Often those are people who are just entering the labour market, and when starting an enterprise they will not have much financial spending power yet. However they are still young and mobile, and can easily move to other cities around the globe. This group will be attracted by affordable housing, in a not too deprived area. The social milieu they are in is totally different from the people that live in disadvantaged neighbourhoods, so they tend to rather settle in the city centre or affordable housing elsewhere.

With the aim of creating an international top sector, the housing needs of expats need to be taken into account also. In this category there are inter-

national that stay a short term, and expats who move here, bring their family and also need international schools. The international reputation of a city matters to attract expats, since they are not familiar with the area before they come.

Amenities

In order to become a cluster that facilitates learning, innovation and the creation of new knowledge, forming a community with local buzz is key. Adding some amenities could enhance this process, to speed up develop-

ments. Case studies of existing clusters like Silicon Valley show that investment in such facilities creates an impetus for the cluster as a whole. In this case there are two main amenities that could be helpful, an event hall that can connect the local cluster to global partners through conferences, and increase the global reputation of The Hague as centre for security, and secondly a complex where small companies can choose workspace and learn from each other, to speed up the innovation process. Those amenities can be funded with public money, since the multiplier effect of innovation jobs creates an advantage for the city as a whole.

Currently The Hague Security Delta organizes events in different locations in the city, and there is a very small campus, which consist of two floors of an office building in the Beatrixkwartier. The events in the security sector vary in size, there is a large

Conclusion

The security sector is a collection of very different companies and institutions, with people from a variety of disciplines. Currently the cluster in The Hague is in a very early stage, some existing companies and institutions committed to increased collaboration, but not many start-ups and spin-offs have emerged yet. Spatially not much happened yet, a small campus has started on two levels of an office building in the Beatrixkwartier, but this is only the start. It is not very visible, and the kind of city environment might not be best for some of the aimed sectors. To stimulate further growth of the cluster some kind of headquarter would be helpful, with space for start-up companies and gathering spaces for national and international events.
1.3 CURRENT SECURITY SECTOR

Location in the urban fabric:

The map on the left shows how the buildings of the companies and organizations of the security sector are located in the urban fabric. Currently many of the partners of The Hague Security Delta are established large companies and institutions, that are located in buildings that stand on themselves, and do not need the urban fabric as much. Those large buildings have incorporated many of the urban functions in themselves, like sandwich shops, coffee bars and conference halls. In this way they have created a local buzz inside their buildings, which is separate from the urban environment. For this reason they do not necessarily need to be located in an interaction environment, some of them are, but for instance TNO, NATO and NFI are typical introverted buildings, with a fence and uninviting appearance. However some large institutions did relocate closer to each other in the past years, the ministries moved from their locations elsewhere in the country to a cluster in the city centre, and some international organizations moved to the cluster around the World Forum. The public space in this cluster around the World Forum is just being reconstructed, to enhance the interaction environment.
Nuclear Security Summit

The map shows the locations that were used for the Nuclear Security Summit, spread out through the Randstad. The main location of the summit was the World Forum in The Hague, however the city did not provide all the facilities needed by itself. Some important events during the summit took place in other locations. President Obama of the United States stayed for instance in a hotel in Noordwijk with his delegation, because that was easier to secure than the hotels in The Hague. The first press conference was in the Rijksmuseum in Amsterdam, where Obama gave a speech in front of the painting De Nachtwacht, and this picture went all over the world. The Chinese-Dutch trade forum took place in Kasteel Keukenhof in Lisse, and the president of Japan went to the greenhouses in het westland to learn and import techniques. At Schiphol airport an entire airstrip was reserved for the American airplanes, Rotterdam-The Hague airport was the place where the airplanes of the other delegations stood. This illustrates how the impact of a major event in The Hague does not stay inside the municipality borders, and how The Hague needs the facilities in the region to be able to house such an event.

Geneva international quarter

Geneva is a city that has a similar specialization as The Hague, with a focus on large international organizations. They are not each other’s direct competitors, since they have a slightly different niche. Geneva is often mentioned as a very good example of an pleasant international city, with a small urban scale and a high quality of life. In this section is studied what The Hague could learn from Geneva. Sometimes Geneva is mentioned for having very good public space, recognizable as an international city. Looking more into details reveals that this is mainly due to two locations: the park and square around the UN building, and the famous fountain. The rest of Geneva looks just like any other city in Switzerland, which looks nice, but is not particularly recognizable as an international quarter. Even though Geneva is only a small city, most international organizations are located in only a part of the city. They are strongly clustered around the UN building, close to the airport and facilities like the congress centre at the airport.
Silicon Valley is often mentioned as a prototype for how a cluster should work. It is very successful in producing start-ups and spin-offs, many technical enterprises are started there. The story of how this cluster came into being in this location illustrates how it is rooted in historical events, some planned and some unplanned. A very important actor in the early days of Silicon Valley was Fred Terman. He is the one who started the Stanford Research Institute in 1946, which is the first initiative in the world at a university which helps students start up enterprises. He had the idea that university and business should be more connected, and stimulated for instance Hewlett and Packard to start HP. Those were two of his students, he taught a radio course at Stanford University in those days. With this initiative he laid the foundation for what later has been named the Triple Helix: the collaboration between university, industry and government.

Terman had not planned to live in this area. In his days the main IT developments took place along route 128 between Boston and New York. But he got ill, and the climate in California was much better for his health. This illustrates how the location of something is not always a rational choice, coincidences and choices of main actors have major impact. Another big stimulus of Silicon Valley are the huge amounts of money invested by the government, mainly through the army. During the second world war and the cold war Silicon Valley expanded super fast, due to the investments of the army in innovative techniques they needed for the war. The initial location of many start-ups was in the garages of the parents of the students. The current location of Apple is still close to where Steve Jobs grew up. He lived close to the HP labs, where he got inspired to start building a computer, and start a company. Nowadays the entire bay area is filled with IT companies. Since a few years a remarkable shift is happening: the cluster is moving from the suburbs to the inner city of San Francisco. The Brookings Institute states that this shift is a trend, that innovative districts will move back into the city.
1.5 Conclusion

GLOBAL POSITION OF THE HAGUE

In these current times of globalization it is key for metropolitan areas in the West to focus on internationalisation and the knowledge economy (Reus, 2011; van Wenden, 2004). Larger metropolitan areas have agglomeration benefits of density and international connectivity that makes them naturally most successful in both the knowledge economy and internationalisation. Smaller cities can be successful if they are able to find their specialization that suits the city and has a global relevance (Scharnagl & Puga, 2000). The spatial expression of such a specialization is visible as various types of clusters.

In The Netherlands the most internationalized places are Amsterdam and The Hague, in light of path dependency it is most promising to focus on these locations for the development of an international top quality. The Hague has a strong international position on the theme of peace and justice, which is rooted in historical events throughout the past centuries. However, to flourish in the knowledge economy entrepreneurial activities on the crossroads of industry and university are very rewarding (Ekeland & Leydesdorff, 1997). The current focus in The Hague is very much on large public institutions (B&A consulting, 2011), while the entrepreneurial climate is weak compared to other successful metropolitan areas in the knowledge economy. An emerging commercial sector that is rapidly growing worldwide, and is related to the specialization of The Hague, is the security sector. The further development of the security cluster could take the international position of The Hague and The Netherlands to the next level (Reus, Spaans, Louw, Hoogerbrugge & Priemus, 2013).

REGIONAL COMPLEMENTARITY

The Hague is a medium-sized city that needs other cities in the region to benefit from metropolitan scale advantages. In order to become an integrated whole, the spatial strategies of the cities should complement each other, instead of competing for the same functions. The Hague needs to be connected to the knowledge base of Leiden, Delft and Rotterdam, since these cities have good universities that are incomparable in scale to the knowledge institutions in The Hague. Amsterdam has some high-end cultural facilities that cannot be made in another city within the Netherlands, since the metropolitan region as a whole does not need those double. Besides leased Amsterdam also offers a living environment that is more urban than in The Hague, and has an unique attractiveness that is different from The Hague. The same goes for smaller towns in the region that offer a different kind of environment that is complementary to the metropolitan region as a whole. The Hague has most international institutions, embassies and government related functions, and is an international centre of peace and justice. New program related to those qualities, like the security sector, would benefit from locating in The Hague compared to locating in other cities in the region.

The security sector is a niche which is related to many different disciplines, ranging from IT and biotechnology to law and international relations. This results in a varied palette of companies and institutions, with very different demands on their urban environment. Therefore, the diverse workforce of this sector also has various different lifestyles with associated varied housing preferences. The Hague is only a medium-sized city, which is not able to provide all those urban environments by itself. It needs the amenities and urban environments of other cities and towns in the region as well, to complement what is present in The Hague.

The centroid of the cluster would be in The Hague, as the centre of a network of companies and city environments in different cities and towns in the region.
PART 2 Conditional spatial aspects

INTRODUCTION
A knowledge cluster of international importance cannot develop just anywhere: next to the urban strategy for the cluster itself there are conditional spatial aspects that are key to create an urban environment with potential. Knowledge workers are very demanding, but are the main resource for the cluster development, so offering the right range of living environments is key for the development of the cluster (Florida, 2009). The first priority is to offer all the desired living environments at commuting distance, and the second priority is to look which living environments should be added in The Hague, near the cluster. Commuting requires good regional accessibility, to benefit from the different existing urban environments in different cities in the polycentric city region. Next to regional accessibility are the global transport connections key for development of a cluster of international importance: this includes airports, high speed trains, and enough road capacity.

Amenities, nature, and attractive city centers are key to offer the leisure opportunities of a competitive environment that meets the wishes where the very mobile knowledge workers look for.
2.1 Living environments

Regional complementarity

The work environments of the cluster strategy cannot be developed isolated from the desired living environments of the people that work in the cluster. Knowledge workers are very demanding, but are the main resource for the cluster development, so offering the right range of living environments is key for the development of the cluster (Florida, 2009). The first priority is to offer all the desired living environments at commuting distance, and the second priority is to look which living environments should be added in The Hague, near the cluster. Commuting requires good regional accessibility, to benefit from the different existing urban environments in different cities in the polycentric city region. The maximum acceptable commuting distance is set at one hour, during rush hours, for both public transport and car, as this is the norm the PBL uses. The map on the left page shows which area can be reached from the international zone in The Hague in one hour, by both public transport and car. This covers a large part of the Randstad, which offers a variety of cities, towns and villages, with a range of living environments for many target groups.

Connecting to Amsterdam

However the unique urban environment of the canals of Amsterdam is just outside the reachable area. This urban environment is unique in The Netherlands since it offers the most cosmopolitan urban environment, still not comparable to the cosmopolitan world cities like London and New York, but a lot closer than the urban environments other cities in The Netherlands can offer. Especially young urban professionals are attracted to cosmopolitan urban environments, both Dutch and international highly educated knowledge workers. Connecting the international zone of The Hague to this area in Amsterdam will raise the potential of The Hague, as well as for the region as a whole. The city center of Amsterdam and the canal area on the south of it should be connected to the international zone in The Hague by a fast train between the cities, combined with fast trains in the city. In Amsterdam the construction of the North-South Line will contribute, and in The Hague a faster train from the train station to the World Forum area should be constructed. These two urban environments are complementa-ry to each other, and cannot easily be created in both cities.

Diagram: Area within commuting distance from the Central Zone in The Hague.

Diagram: Improve connection between The Hague and Amsterdam.
Commuting and the regional complementarity of different towns and cities near The Hague offer many of the desired living environments. However, some types of housing should be developed in The Hague, because proximity to the international zone is more important in those cases. The main shortage in The Hague is for short-term housing for both internationals and students. These target groups look for furnished studio apartments near the city center, the first group more concerned with quality, and the second with affordability. The housing preferences of internationals differ a bit from Dutch people in some issues with the interior of apartments: for instance, Dutch stairs are considered very steep, Dutch hallways and kitchens very small, and many internationals prefer an ensuite bathroom. Student housing can be a solution for 24-hour liveliness in areas where safety in the nights is an issue. Student housing, a location near the city center or near the educational institution is often considered more important than the conveniences in the house.

The neighborhoods in The Hague, where currently many internationals live, can roughly be divided into three categories. First, the green, urban, classic environment of Benoordenhout; second, the urban, prewar environment of the Statenkwartier; and finally, the vinex environment of Leidschenveen and Ypenburg. The first two are more expensive, while the latter offers a cheaper kind of family housing, which has become the center of the Asian expat community. These three living environments in The Hague are very popular among internationals; however, this does not mean that The Hague needs to focus on creating more similar environments. The map on the left page shows that there are similar living environments available in The Hague, so the priority should go to adding other living environments that are missing in The Hague, like more short-term studio apartments.

According to the Province of South Holland:
- Short stay expat housing
- Affordable housing for starters
Rent below €650 per month
Buy below €170,000
These two target groups already face a housing shortage currently, while these are also key target groups for the development of an international knowledge cluster. While aiming to strengthen the security sector in The Hague, housing for these groups needs to get much priority. Short stay expat housing is key for internationalisation, and the dynamics of people staying for a few months. Starters are key for an innovative and entrepreneurial knowledge base.
In order to create a knowledge cluster of international importance, both the regional and international accessibility are key. In this section some issues are discussed that could improve the accessibility from The Hague, which is mainly from one side, due to the location by the sea, and second the connection to Rotterdam-The Hague airport. Other issues regarding the accessibility of The Hague are the integration of the metro system of Rotterdam with the tram system of The Hague, and the construction of the Rotterdamsebaan.

**Rotterdamsebaan**

The main international connection goes through Schiphol airport, which is well connected to the worldwide air network, and is also well connected to The Hague by car and train. However the Rotterdam-The Hague airport just north of Rotterdam is very poorly connected by public transport. The capacity of the airport is incomparable to the size of Schiphol Airport, however it can play a different role as for instance business flights or private planes during large conferences. During the Nuclear Security Summit in February 2014 some airplanes with delegations arrived at Rotterdam-The Hague airport. Currently there is an no trains to this airport, which results in a long travel time from The Hague, even though the straight line distance is very small. A fast train from The Hague to this airport could use the existing train tracks, only a few hundred meters of rails need to be added near the airport. An alternative solution would be to move the gate to the other side of the airport, and add a station to the RandstadRail line between Rotterdam and The Hague. The disadvantage of this solution is the slow route of this line through villages like Pijnacker.
Leisure is a key asset to facilitate the high standards of quality of life for knowledge workers and internationals. The Hague is a fairly small city for the global importance of the organisations it houses, which enables the low density and green environment. The location by the sea is a key quality, that should be utilised more. Currently there is a line of low quality developments in between the nice area of The Hague and the sea.

In the mental map of internationals some specific areas in the region play an important role: for instance the city center of Amsterdam, with the Rijksmuseum, and other high-end amenities. Also the Keukenhof as display of the Dutch specialization in flowers is a quality that can also be utilized as a conference location or for leisure.

THE HAGUE CITY BY THE SEA - The international zone is conveniently located between the city center of The Hague and the sea, however currently the seafront boulevard is crammed with low quality developments. Upgrading the area around the Kurhaus will reconnect the international city to the sea, and restore the historical allure of the Kurhaus.
PART 3 Urban strategy for the security cluster

INTRODUCTION
In this final part the focus is on the design of an urban strategy for the development of the security cluster. The established knowledge is applied into strategy to foster the security sector in The Hague, and develop the sector into an innovative knowledge cluster of international importance. The main challenge is to combine the theoretical knowledge about the ideal layout of a cluster in the context of the complex reality of the location. After a range of design experiments, the method was established to divide the cluster in subclusters, and combine those with the various location profiles in The Hague. A more detailed analysis of the security sector resulted in a range of subclusters, each subcluster being a group of different businesses and organizations working towards a similar goal. The location preferences of these subclusters is determined based on three characteristics: the size of the businesses or institutions, their main activities, and the kind of people that work there. These variables help to link the specific location preferences of the cluster to established knowledge in literature. A more detailed location analysis revealed the range of location profiles in the Central Zone in The Hague, where the majority of economic activities is centered. Combining the location profiles with the subclusters led to a strategy with key interventions. In the fifth section this strategy is compared to earlier design experiments, which were aimed to find one location in the Central Zone to locate the centroid of the cluster. Finally it is reflected which conclusions can be drawn from this design exercise about general knowledge about urban design for cluster strategies, about general planning issues in The Hague, and about urban design for the security sector.
Goal: Growth of the High Tech Campus Eindhoven into an innovative cluster of international importance.

Comparing The Hague Security Delta to presidents

The goal is to develop an urban strategy that facilitates the growth of the security sector in The Hague into a knowledge cluster of international importance. The elements of the urban strategy are key interventions to establish the backbone of the spatial conditions that are necessary to enable cluster development. Comparing the security cluster to presidents gives interesting clues about the spatial characteristics of successful clusters. The high-tech campus in Eindhoven is a president for a large number of innovations, facilitated by a campus design that stimulates interaction. The tech cluster in Geneva is a president for its internationally established identity as a location for international institutions, combined with a commercial center of banking and high-end business services. An interesting observation in Geneva is that the majority of international institutions is in a different part of the city than the commercial business. The Facebook campus in Silicon Valley is an example of the corporate campus approach with amenities combined with a shared area that stimulates interaction.

Method: For developing an urban strategy

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The location preferences of different elements of the security cluster depend on the people, the size of the organization, and the activities.

**Activity**
Companies have departments at different locations: headquarters of different companies cluster in central business districts, while the R&D department can be in a businesspark at the edge of another city, and the industrial production can even be at a factory in another part of the world were similar parts are produced for other companies.

The reason for this is that a sector works, like local buzz and global pipelines (Bathelt, 2009) in local buzz companies learn from each other, while established relations are global pipelines that do not need proximity all the time. The relationships within a company between different departments are often easier to maintain than relationships with similar departments of other companies; a decision at the headquarters can be communicated by phone or email to the production department, because there is a hierarchical relationship, and this relationship does not need much regular effort to maintain, while the relationships between headquarters of different companies are much weaker, and need more face-to-face contact to maintain.

**Size of the organisation**
The size of the company or institution has much impact on which locations in the city are suitable. For instance the big buildings of large businesses and institutions do not have to stand in the city parts with a building typology with smaller traditional blocks. Those large organisations locate in areas where they can construct large new buildings. Smaller organisations prioritise neighborhoods that allow amenities, or related other organisations.

**Large businesses and institutions**
Large businesses and institutions have their own amenities inside the building, and the organisation also has critical mass in the different departments, this city dynamics inside the building gives the opportunity to isolate the organisation from the surroundings of the building.

**Small businesses and organisations**
Small businesses and organisations do not have the mass to support private amenities, so they need to use public amenities or organise shared facilities. For collaborative projects they depend on related program in the surroundings, they benefit from collaborative buildings like incubators.

**Location in areas with small- or units available for rent**

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**Location preferences**
Decisive factors for different people and activities

**People: alpha, beta, gamma**
The preference of the people that work in an organisation is determining for the location of the company or institution, in our current knowledge economy (Florida, 2000). Knowledge workers are very demanding and cities around the world compete to attract those people, who are the motor of innovations and the creators of new knowledge.

In Part 2 the living preferences of those people are discussed; this chapter focusses on the preferred working environment of knowledge workers.

This is not a homogeneous group, roughly they can be divided in alpha (bohemians), beta (nerds) and gammmas. Alpha’s are people who are focused on symbolic interaction, like artists, designers, writers, linguists, religious activists, human rights activists etcetera. Those people prefer an urban cosmopolitan space for new construction, with many amenities and status.

Beta’s (nerds) are people who also have a very organized and structured way of working, their activities are related to technology, like research and development activities. Beta’s prefer a spacious location, with a good price per square meter ratio, and they prioritize conveniences like nearby parking facilities. Gamma’s are people who work in complex organisations and institutions, they work mainly from experiential knowledge. Gamma’s prefer a high-end urban environment, with many amenities and status.

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**Business service: Lawyers**

**NATO**

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**High-end urban environment, with many amenities and status.**

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**Location preferences**
Decisive factors for different people and activities

**The location preferences of different elements of the security cluster depend on the people, the size of the organization, and the activities**

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Decisive factors for different people and activities

**The location preferences of different elements of the security cluster depend on the people, the size of the organization, and the activities**
Subclusters Functional clusters with similar activities

Program with related spatial priorities

Conferences are a key asset of clusters, because they enable people to man-

Interorganizational organizations make policy for subjects that need to

Research and development locations are a major location for technical innova-

Innovations, research and development often results in new technologies that
do not exactly fit in the current scope of these enterprises. Spin-offs from
developed companies and start-ups with new ideas are key to an innova-
tive environment. An entrepreneurial environment with an easy climate for
start-ups is the key asset of the innovative cluster of Silicon Valley.

High-end businesses like lawyers, accountants and consultants facilitate
both the growth of small companies into bigger ones, but are also a location
priority for corporate businesses to locate close to. These business service are
crucial for the economic ecosystem.

Specialized business in all different levels creates the opportunity to include the
local workforce in the sector, and also creates a location advantage that
attracts businesses looking for skilled people.

Corporate business has the scale and financial capabilities to acquire inno-

Creative business services like test writers, graphic designers and prototy-
pic designers are able to connect the technical developments to the people,
by communication and adjusting the products to the wishes of the people.

Development departments of semi-public
technology and R&D institutions like TNO, corporate busi-
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The majority of economic activities in The Hague are concentrated in the Central Zone. This area reaches from Scheveningen through the international zone and the city center to the industrial redevelopment areas of the Binckhorst and Laakhaven. Many people who work in the Central Zone live somewhere outside the city, and commute daily. International organizations are an important share of the local economy, with many international employees, but also Dutch people find jobs in these organizations. The top of the organizations is often made up by high-end jobs who recruit all over the world. However the pyramid of jobs below this top is filled with local employees, which makes international organizations an important employer. The international employees who are attracted by these organizations often bring their families, which stimulates the local economy, because they often have the financial resources to spend.

The Central Zone is the axis where most economic activity of The Hague concentrates.

150,000 People work in the Central Zone

33 International organisations in NL
International courts & tribunals, European institutions, organisations like OPCW
8100 Employees
5700 Family members

105 Embassies
3700 Employees
1850 Family members

Bottom-up initiatives registered by the municipality The Hague

Innovative companies, by Wetzel (2009)

Partners of The Hague Security Delta network

The Central Zone is the axis where most economic activity of The Hague concentrates.
**Leisure boulevard** Kurhaus as conference location and high-end beach leisure

**Scheveningen**

**LOCATION PROFILE**

- **HIGH-QUALITY HOTEL**: The Kurhaus is has the historic allure to house high-end activities and target groups.
- **SEASIDE LEISURE**: Scheveningen is in between The Hague and the sea, the potential spatial quality of The Hague as city by the sea is in Scheveningen.
- **AMENITIES**: Scheveningen has many restaurants and bars, as well as some cultural amenities like the Circus Theatre.
- **ACCESSIBILITY**: Scheveningen is one of the best connected beach resorts of the Netherlands by public transport, there are regular trams to the Central train station, and this connection is currently being upgraded with a higher quality tram.

**PROBLEMS**

- **LOW-QUALITY AROUND KURHAUS**: Low-quality developments around the Kurhaus have deprived the visibility of this historic building, and reduced the high-end area to only inside the Kurhaus itself.

**MATCH WITH PSN**

- **CONFERENCE PRIORITIES**
  - Near Hotels
  - Nature & Leisure
  - Security

**INTERVENTION**

- Clean up around the Kurhaus, clear some space to create a high-end area for conferences and leisure.

**Elements of the security cluster that have location preferences that match the characteristic qualities of the leisure boulevard.**

[Diagram showing the location profile and intervention strategies for Scheveningen.]
International peace park  Scattered buildings in the green

Conference cluster in the area around World Forum with large institutions

LOCATION PROFILE

LARGE SECURED BUILDINGS: The cluster is dominated by large buildings, each of another large international institution. Those organisations are very concerned with security.

CONFERENCES: The World Forum is a major conference location, and also the Crown Plaza Hotel can host conferences. In case of large conferences like the NSS a part of the public space can temporarily be occupied.

GREEN: Next to the cluster are the Scheveningse bosjes and Zorgvliet, two large parks, and the public space in the cluster has just been re-landscaped, with dune plantation.

INTERNATIONAL ZONE: The cluster is in the middle of the international zone, near the Peace Palace, near many embassies, and in the area where many internationals live.

PUBLIC TRANSPORT: The area is currently not so good connected by public transport, a direct high-speed connection to the central train station would be a major improvement.

NO SHARED AMENITIES: Currently the large buildings have no interactions with the public space, and due to the security concerns this cannot be realized on the photos.

INTERNATIONAL LINE: Fast tram connection to the central train station, that passes by the embassies quarter.

INTERVENTIONS

PAVILIONS: in between the buildings with shared amenities and flexibel workplaces, to be able to meet people from international institutions without needing to pass the security of the buildings.

London Bridge

Municipal Museum

Photo Museum

Omniversum

World Forum

Beursplein

THE CENTRE

Large buildings

High defficiency level

High security level
Secretive tech campus Innovative R&D cluster in the dunes
In the area around the Frederikskazerne, the new International Criminal Court and R&D departments of NATO and TNO

LOCATION PROFILE

CLOSED TO THE PUBLIC: The cluster is located at the border of the city, where not many people pass by, and the premises do not need the public in any way. The buildings are inaccessible for the public.

CAR ACCESSIBILITY: The area is very well connected to the highway, and there is much parking space around the buildings.

SPACE TO EXPAND: The cluster is located at the edge of the city, where there is much space for expansions.

TECH INNOVATION: The activities of the (semi-public) institutions are focused on technical innovations, and research and development.

INTerventions

PUBLIC TRANSPORT: The area is currently not so well connected by public transport, with the new International Criminal Court the area will have over 5000 employees, which could make more public transport possible.

NO SHARED AMENITIES: Currently the large buildings have no interaction with the public space, and due to the security concerns this should be designed in separate buildings.

CAMPUS WITH SHARED FACILITIES

Create a campus in between the current buildings, connected with a path for pedestrians, bicycles and e-cars.

SPACE FOR EXPANSION: There is enough space for future developments, like other large R&D departments, or many small enterprises.

TECH R&D

PRIORITIES

NO INTRUDERS: Innovations are often secret, and only professionals work on them together

NO SHARED AMENITIES: Due to the security concerns this should be designed in separate buildings

START-UPS & SPIN-OFFS

A new building in between the current buildings, connected with a path for pedestrians, bicycles and e-cars.

TECHNOLOGY INCUBATOR: Add facilities for start-ups and spin-offs near the large mass of research and development of the large organisations like TNO, NATO C3, and MIVD. These small enterprises can stimulate innovation.

CAMPS WITH SHARED FACILITIES

Create a campus in between the current buildings, connected with a path for pedestrians, bicycles and e-cars.

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**Prestige quarter**  
Historic city blocks with international organisations

The embassies quarter has many NGO’s, high-end business services, and high-end amenities

**LOCATION PROFILE**

**HIGHEST PRIORITIES**

- Prestigious location
- High-end business services
- High-end amenities

**ELEMENTS OF THE SECURITY CLUSTER**

- Top secret science centre
- Gateway to The Hague

**MATCH WITH**

**FSD**

**INTERVENTIONS**

- Symbolic city gate above Utrechtsebaan
- Central train station

---

**Gateway to The Hague**  
Place to create public visibility for the cluster

The entrance to the city is here, with the central train station and the main highway into The Hague

**LOCATION PROFILE**

**CENTRAL TRAIN STATION**

- Central train station is an important connection to the region and to the airport, it is the entrance to The Hague by public transport

**HIGHWAY**

- The highway is next to the sea, with all car traffic coming from the east, and enters the city through the Utrechtsebaan. New construction of the Rotterdamsebaan is planned, which will also enter The Hague in this area

**HIGHRISE**

- The buildings in this area are constructed in the last decades, and mainly highrise

**MATCH WITH**

**FSD**

**INTERVENTIONS**

- Symbolic city gate above Utrechtsebaan
- Central train station
Elements of the security cluster that have location preferences that match the characteristic qualities of the location profile.

Creative warehouses  Industrial redevelopment area

LOCATION PROFILE

FORMER INDUSTRIAL AREA. The parcel size is large, and many buildings are still large industrial buildings, some are rebuilding for new functions.

LOW LAND PRICES. The prices of buildings and land is still very low, even though the location is near the city center to the north, and near a nice housing area to the south.

CAR ACCESSIBILITY. The public transport within the area is still weak, but there are two main roads right beside the area. The accessibility by car is fairly good, with a highway right next to the area.

CREATIVE BUSINESS SERVICES

People with creative business services prefer historic buildings and rough industrial redevelopment areas.

AFFORDABLE. Often they can not afford an expensive location, and too neat areas are less inspiring.

COLLECTIVE BUILDING

Incubators with multiple creative enterprises are beneficial and inspiring.

FORMER INDUSTRIAL AREA. The parcel size is large, and many buildings are still large industrial buildings, some are redeveloped for new functions.

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TECH & R&D

People with tech & R&D companies often work in teams, and only professional work can be done together.

SPACE FOR FACILITIES. Professional facilities like laboratories and workshops need a spacious environment.

LIVELYNESS. A green campus-like environment is very much appreciated by the employees of R&D companies.

Elements of the security cluster that have location preferences that match the characteristic qualities of the location profile.

Business district  Second national center of corporate business

LOCATION PROFILE

CENTRAL TRAIN STATION. The area is well connected by public transport: the central train station is 10 minutes walking away, and the Randstadrail crosses through.

HIGHWAY. The Utrechtsebaan passes through the area, some buildings are build over this main highway into the city. The Beatrixkwartier is well connected for car traffic.

HIGHRISE. The building typology is dominated by highrise. Large buildings of corporate business, and office buildings combined with other functions.

CORPORATE BUSINESS

LARGE BUILDINGS. Corporate businesses need space to build large buildings, preferably space for new construction.

ACCESSIBILITY. International and regional accessibility.

FLAT OFFICE SPACE.

Three days in a week, many businesses use office space in different cities, for projects between companies and collaboration.

INTerventions

FORMER OFFICE SPACE. The demand for flexible office space is growing, while many large office buildings are empty. Large office buildings should be divided in smaller furnished units which can be rented for shorter periods of time.
Comparing strategies Subclusters at different locations or one core

Prior to the development of the strategy as described on the previous pages, some design experiments were done, looking for one location to be the core of the cluster. The leading principle was to look for a location in the Central Zone with a mix of different typologies, to house the variety of elements of the cluster. In addition the location should have potential for change: buildings that will soon be available for redevelopment, or a fairly large current stock of flexible office space for rent.

STRATEGY 1: different subclusters spread throughout the Central Zone

With a few key interventions the different urban environments in the Central Zone can house the variety of functions of the security cluster. In those subclusters similar activities of different stakeholders are concentrated, to stimulate interaction between the different parties. With a few expansions of the current tram network those places can all be at 15 min travel away from each other.

STRATEGY 2: different subclusters spread throughout the Central Zone

STRATEGY 2A: concentrate along International Line, Koningskade

The Koningskade is a street with a mix of typologies: at one side the street passes by the prestige quarter, with historic buildings, while the other side of the street was demolished in the war, and has now larger buildings. There is a range of different types of offices available: smaller ones in the historical buildings and bigger in the newer buildings. With the construction of a upgraded street traffic is very well connected, near the city centre, near the second business district of the country, and along the Bezuidenhout, a street with large offices for national Ministries.

STRATEGY 2B: concentrate behind central trainstation

Behind the central train station is a location with much potential for development: many buildings will soon be empty, at this very well connected location, near the central train station, near the second business district of the country, and along the Bezuidenhout, a street with large offices for national Ministries.

Deliberation

The main difference in design principles between strategy 1 and strategy 2AB is the balance between prioritizing proximity between the different elements of the cluster versus the matching the cluster with the location profiles. However in the generated strategies some other differences show up: when matching the subclusters with the location profiles (strategy 1) the various elements of the security cluster will be closer to similar elements of other clusters. In this strategy similar activities of the different clusters are at the same location, so that the new elements of the security cluster will be very close to existing critical mass. The proximity of subclusters close to related activities of other clusters might be even more stimulating for innovation than being close to other activities of the security cluster. In the process of dividing the cluster in subclusters a more nuanced image of the relations between the elements of the cluster came to the surface, in which some elements need as much proximity as possible, while the relationship between others can be less intense.

Conclusion

The main advantage of Strategy 1 is that it has more future growth potential, and the specific location preferences of different subclusters is considered more important than even more spatial proximity between subclusters. Within the subclusters the local buzz is better at different locations in the Central Zone. With improving public transport connections, those different locations will be only about 15 minutes away from each other.

Arguments for various subclusters

Subclusters match the current location profile very well, only small interventions will be sufficient. Moreover the different locations already all have some critical mass related to the subcluster. Low initial investment, most subclusters can start developing now.

More space for future expansions, each subcluster has space to expand separately, so all together the cluster can grow much bigger.

Concentration and local buzz in subclusters, in those subclusters are related activities that need daily face-to-face contact, different subclusters have different people and different activities, that need less regular encounters between different stakeholders. Option for shared amenities, and a headquarter which is close to the entire cluster.

In strategy similar activities of different clusters are at the same location, that way the new elements of the security cluster will be very close to similar elements of other clusters. In this strategy similar activities of different clusters are at the same location, so that the new elements of the security cluster will be very close to existing critical mass. The proximity of subclusters close to related activities of other clusters might be even more stimulating for innovation than being close to other activities of the security cluster. In the process of dividing the cluster in subclusters a more nuanced image of the relations between the elements of the cluster came to the surface, in which some elements need as much proximity as possible, while the relationship between others can be less intense.

Conclusion

Strategy 1 is a better option, since it has most future growth potential, and the specific location preferences of different subclusters is considered more important than even more spatial proximity between subclusters. Within the subclusters the local buzz is better at different locations in the Central Zone. With improving public transport connections, those different locations will be only about 15 minutes away from each other.

Arguments for one main location

Spatial proximity between different elements of the cluster, which enhances the chance for spontaneous encounters between different stakeholders. Option for shared amenities, and a headquarter which is close to the entire cluster.

Two those locations have a mix of typologies, with big buildings for large organizations, and smaller historical buildings, along a street with allure.

STRATEGY 1

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design challenges

IMPLEMENTATION IN INTERNATIONAL POLICY

Intergouvernmental organisations. Currently there are some major international organisations located in the world-known area.无力和建筑物可用作停机坪或供鸟儿休息。更多重要和建筑物可用作停机坪或供鸟儿休息。Intergovermental organisations and Embassies. They can play an important role in the security sector.

ACCESIBILITY

High-quality city trains. Currently there is a problem with the connection to the city centre. The city train will be improved.

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<td>Fit more security tech to provide better services and safety.</td>
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<td>Flexibilisation and interaction</td>
<td>Add a facility for start-ups and spin-offs, near the large mass of research and developments projects.</td>
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<td>Symbolic city gate above Utrechtsebaan.</td>
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<td>Space for expansion</td>
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DESIGN CHALLENGES
Urban strategy and design to develop the security sector in The Hague

Interaction environments with clusters of related program

**VISION**

The security sector in The Hague should be the place where the local and the international community work together to create security innovations and implement them in international policy. The urban fabric should offer the specific urban environments for the various elements of the sector, designed according to their specific location preferences. The three most crucial elements to develop in The Hague are a location designed for collaborative tech-innovation, a location to implement those in international policy, and a location to connect to the local community.

**STRATEGY**

A few key interventions in these locations will enable the development of a strong security cluster, embedded in current clusters in the urban fabric. These are the construction of an R&D campus for tech-innovations near current security organizations, the further development of the cluster for international institutions and conferences, and adding specialized education and public functions to clusters in the city center.
Security innovation campus
collaborative tech-R&D behind gates

DESIGN PRINCIPLES

Central facilities & amenities
Incubator
Central facilities & amenities
Business complex
Loculator
New construction

INTERACTION ENVIRONMENT

Central location with shared facilities, representative rooms, business complex, technology labs, childcare

BOULEVARD IN THE DUNES

Central boulevard connecting the campus

SPACE FOR EXPANSION

Parcels available for corporate R&D departments, international security companies or semi-public institutions

R&D campus for security professionals
International allure & security standards in the World Forum area

DESIGN PRINCIPLES
- New entrance to Park Sorghvliet near the World Forum and new pavilion
- Renew the facade of the World Forum
- Bilingual childcare amenities near the area

INTERACTION ENVIRONMENT
- Exclusive Park
- Singels around the area, to decrease required fences during large conferences

EXCLUSIVE PARK
- Redevelopment buildings in the area for international organizations

Horeca and flexible workspaces in a pavilion and in the ground floors of The Statesman and Toren van Oud

World peace authorities
intergovernmental institutions & conferences
Top Secret Security Center in the former American Ambassee

Gateway to security city
educational & public program

Professional education, conference, artistic & science center where the newest technologies are displayed.

Specialized educational programs (MBO, HBO, university), student housing, large lecture rooms.
the conclusion of the research and design has a generic theoretical side and an applied solution for the case of The Hague. The proposal for a strategy and design approach applied for the case, this showed at the previous pages. The generic conclusions are elaborated in this chapter. The main findings can be summarized as follows: design and creativity contribute to the development of the sector/y. The Hague into an innovative knowledge cluster of international importance. The approach was to look from the theoretical perspective of economists and search for the link with the design practice of urbanism. These are parallel universes with a rich body of knowledge, that provide a totally different viewpoints to clusters. The combination of literature review and the design elaboration in The Hague provides understanding about connection between these two disciplines. Firstly the search for the application of spatial economic theory resulted in a set of generic principles for the design of clusters. The result is a framework for designing clusters: 

1. The framework is applicable in practice. The framework allows the creation of an innovative knowledge cluster.
2. Different activities of different parties is an increasingly important phenomenon, which increases the demand for flexible workspaces. Creating an attractive location for a certain mix of program.
3. Hence it is crucial to prepare those areas for the future. Established methods are amenities in business district. Stimulating interaction in business districts is key to different typologies of environments that enable these facilitation.
4. Global bad starting enterprises, by enabling interaction between different clusters. Some of the critical mass to stimulate localization economies in an innovative knowledge cluster.

ENHANCING LOCALIZATION ECONOMIES

Urbanization economies refers to the economic advantages of a divers mix of urban amenities. A dense urban area can enable network events. The dimensions of sub clusters and the distance, and creating shared facilities and amenities. The interaction between these two sub clusters is less frequent, since the relationship between different clusters is closer to supply and demand than to intensify collaborative innovation. However by locating the sub clusters within the same city, the network of people will merge through the shared urban amenities outside the sub clusters. These are for instance cultural events, sports or a certain hobby, or semi-professional activities like lectures and network events and sub-clusters. The interaction between sub clusters thus depends on the desired frequency of interaction, combined with the time people are willing to travel to the facility.

ENHANCING URBANIZATION ECONOMIES

Urbanization economies refers to a critical mass with a related variety of program near each other. An urban designer can stimulate localization economies by creating an attractive location for a certain mix of program. Urbanization economies refers to the economic advantages of a divers mix of urban amenities. The interaction between these two sub clusters is less frequent, since the relationship between different clusters is closer to supply and demand than to intensify collaborative innovation. However by locating the sub clusters within the same city, the network of people will merge through the shared urban amenities outside the sub clusters. These are for instance cultural events, sports or a certain hobby, or semi-professional activities like lectures and network events. And network events. The dimensions of sub clusters and the distance, and creating shared facilities and amenities. The interaction between these two sub clusters is less frequent, since the relationship between different clusters is closer to supply and demand than to intensify collaborative innovation. However by locating the sub clusters within the same city, the network of people will merge through the shared urban amenities outside the sub clusters. These are for instance cultural events, sports or a certain hobby, or semi-professional activities like lectures and network events. The dimensions of sub clusters and the distance, and creating shared facilities and amenities. The interaction between these two sub clusters is less frequent, since the relationship between different clusters is closer to supply and demand than to intensify collaborative innovation. However by locating the sub clusters within the same city, the network of people will merge through the shared urban amenities outside the sub clusters. These are for instance cultural events, sports or a certain hobby, or semi-professional activities like lectures and network events. The dimensions of sub clusters and the distance, and creating shared facilities and amenities. The interaction between these two sub clusters is less frequent, since the relationship between different clusters is closer to supply and demand than to intensify collaborative innovation. However by locating the sub clusters within the same city, the network of people will merge through the shared urban amenities outside the sub clusters. These are for instance cultural events, sports or a certain hobby, or semi-professional activities like lectures and network events.

Dividing a cluster into sub clusters with related location preferences is found as an important phenomenon. A good climate for start-ups speeds up the development and commercialization of these innovations. Incubators can be expanded in a certain direction. Critical mass can expand in a certain direction. Critical mass can create a sub cluster. This is done through finding a location which complies with many location priorities, combined with a few key interventions to solve the remaining issues. Offering an urban environment which matches the location preferences of the sub cluster facilitates the development of the cluster, and not the sub cluster.

The first step is to find a current critical mass of related program. This is done through finding a location which complies with many location priorities, combined with a few key interventions to solve the remaining issues.
In analyzing the spatial challenges in The Hague similar issues recur. The first is the challenge of creating liveliness in big scale areas through small scale developments at the ground floors. The second planning issue in The Hague that stood out in this project is the challenge to create flexible office space and smaller units for rent. Vacancy of large office buildings is another issue of these areas, which also needs increased attention for the smaller scale. Large buildings should be divided into smaller units, to prepare these areas for the increased demand for flexible office space and smaller units for rent. The second planning issue in The Hague that stood out in this project is the challenge to create areas for tech innovation in an institutional city. The major strength of The Hague is in policy, government and international diplomacy. It is a challenge to add an innovative spirit to this sector, because in this sector are different people with other location preferences. The city planning and the economy of The Hague in the direction of innovations and entrepreneurship in the technical sector.

The secrecy of the security sector and the open cluster dynamics of a knowledge cluster seems to be opposites. However the levels of exclusivity and security vary for different elements of the security cluster. By organizing the different elements in sub clusters, the level of secrecy can vary between locations. The first type is the R&D campus. Interaction and shared professional facilities are a key asset of a research and development campus, while this sub cluster does not need any contact with laymen. A gained campus with open interaction inside the gate is a spatial solution for this sub cluster. The second is the location for the implementation of technical innovations in intergovernmental policy. This sub cluster has the highest security levels, due to the high risks of becoming the target of an innovative solution for security in public space would enable these buildings to be embedded in the urban fabric. Separate from these two sub clusters can be the parts of the cluster that are meant for the public: like educational facilities, a science center and a symbolic visible campus, while this sub cluster does not need any contact with laymen. A gated campus with open interaction inside the gates is a spatial solution for these buildings to be embedded in the urban fabric. Separate from these two sub clusters can be the parts of the cluster that are meant for the public: like educational facilities, a science center and a symbolic visible campus, while this sub cluster does not need any contact with laymen.

FURTHER RESEARCH

Economic research into the performance of clusters would provide very valuable information for urban designers if the classification of clusters was related to spatial features. There is therefore a need for research into the relation between the urban topology and the performance of clusters from a certain sector. The current location of various sectors in the urban fabric: gives reason to suspect a relationship between the sector of a cluster and the urban typology this cluster performs best in. Moreover the programmatic ideal cluster could be further examined. This approach of dividing the cluster in sub clusters enables different levels, which creates an interesting challenge for the design of public space. By organizing the different elements in sub clusters, the level of secrecy can vary between locations. The first type is the R&D campus. Interaction and shared professional facilities are a key asset of a research and development campus, while this sub cluster does not need any contact with laymen. A gained campus with open interaction inside the gate is a spatial solution for this sub cluster. The second is the location for the implementation of technical innovations in intergovernmental policy. This sub cluster has the highest security levels, due to the high risks of becoming the target of an innovative solution for security in public space would enable these buildings to be embedded in the urban fabric. Separate from these two sub clusters can be the parts of the cluster that are meant for the public: like educational facilities, a science center and a symbolic visible campus, while this sub cluster does not need any contact with laymen. A gated campus with open interaction inside the gates is a spatial solution for these buildings to be embedded in the urban fabric. Separate from these two sub clusters can be the parts of the cluster that are meant for the public: like educational facilities, a science center and a symbolic visible campus.

URBANISM AS AUTONOMOUS CRAFT

Even though there seems to be an interesting opportunity for cross pollination between economics and urbanism, arguments from the economic perspective cannot fully cover urban design decisions. Besides economics there are many other fields that develop theories related to the city, like sociology, traffic engineering, landscape design, subsurface infrastructure. Some argue that urbanism as a craft is a result of blending these disciplines. Even though all these disciplines provide various interesting perspectives, the craft of designing meaningful urban interventions cannot be marginalized to combining all the information.

Studying the relationship between economic performance and urban design involves to deepen understanding about the arguments behind certain strategic decisions in urban design, however theories about economic performance cannot fully substitute any urban strategy. The impact of urban design in urban design outcomes, while the same theoretical framework may result in different urban designs. The zeitgeist, the style of the designer, and most important the context of the location to have the biggest impact on the urban design. Even though understanding about related disciplines is important, the craft of designing meaningful urban interventions cannot be marginalized.
In this section is reflected on the results of the research and design in the graduation phase, on the product, the process and the planning. The aim is to look back and see whether the approach worked, firstly the choice of method (how) and secondly the argumentation (why). Subsequently the chosen approach is related to the wider societal context, and the theme and methodical line of the studio.

**APPROACH**

The method to find a way to embed the theoretical ideal cluster in the urban context was to parallel study the program of the cluster, analyzing the location, and looking at case studies. The goal was to combine those into a design intervention. This was done by categorizing the spatial priorities of the cluster, which resulted in key location priorities of the different subclusters. The location priorities of these subclusters are found by categorizing them by size of the organization: these are features that have location preferences compared to other graduation projects. The theme of the graduation studio was very broad: the entire urbanism of the city. Most of the literature review was done in this period. After P2, in the process of finding the spatial strategy of the actual cluster, the challenges turned out to be slightly different areas than covered in the literature review. Some additional research about location preferences of various target groups had to be assessed, in order to make the cluster instead of just understanding how the cluster dynamics worked. In the end the amount of literature is quite big compared to the various location preferences of different elements of the cluster, the implementation of this cluster, the challenges turned out to be slightly different areas than covered in the literature review. Some additional research about location preferences of various target groups had to be assessed, in order to make the cluster instead of just understanding how the cluster dynamics worked. In the end the amount of literature is quite big compared to the various location preferences of different elements of the cluster.

**PLANNING**

Up till P2, the midterm presentation, the focus was on understanding the programmatic approach to urbanism in this graduation project is very relevant in the current times of intervening in the existing fabric, rather than greenfield developments. Often the build environment has a much longer change interval compared to the programmatic changes; buildings have a longer lifespan than the program inside. Moreover in these times of globalization the specialization of cities is key for the socio-economic vitality of society, a theme much discussed by urban economists. However, the implementation of these theories has to be done by urbanists, which makes clusters a key theme to understand, in the cross-over between economic geography and urban design.

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Regarding the accelerated graduation program due to the changed architectural law, the acceleration was mainly in the second half of the project, while the biggest challenge of connecting the research and design was also in this period. In hindsight the acceleration could better have been in the first half of the project, the orientation phase was now very long, while the actual strategy development was quite fast.

**STUDY AND RESEARCH THEME**

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the fun times we had together, and many thanks for how you helped in organizing the facility issues around my final presentation. Underlined a super sweet song. Thanks for each time you cleaned up my mess, cooked for me, and being there for me, you’re the best! Marjan en Sjoerd, thanks for your support, for all spoken to you for weeks, but the day after I got ill and was stuck in bed feeling miserably and lonely, the mailman suddenly delivered a box full of magazines and a CD in which you

Mom, thanks for taking such good care of me, you have been the most caring mother I could wish for. Your mother instinct is so strong, I remember a few years ago when I hadn’t

When we would go for a bike ride on summer evenings to Leesten, the vinex neighbourhood in our town, we would look at all the new original houses and discuss which we liked.

I remember when I was only 9 years old you told me about an urbanist you worked with, explained what an urbanist does, and told me you could see me become an urbanist later.

In addition I would like to thank my family and friends for being there for me when I needed it, and giving me space to study like a workaholic during deadline seasons. Dad, I

REFERENCES


