Place-making with the makers

Exploring directions of place-making strategies in the redevelopment of industrial urban areas into mixed-use areas

Case of Schieoevers Noord, Delft

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"We are more likely to fail as craftsmen due to our inability to organize obsession than because of our lack of ability."

- Richard Sennett in *The Craftsman* (2008)

Colophon

Personal

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Abstract

The lack of effective place-making strategies to transform industrial urban areas into mixed-use areas, and the limited knowledge of how manufacturers interact with other actors, have exposed the vulnerability to future challenges of these redevelopment processes. Therefore, this research aims to identify directions of place-making strategies to overcome future challenges in the redevelopment of industrial urban areas, through the interaction of actors in the case of Schieoevers Noord. This is done following a research by design with a qualitative approach through the analysis of the case and its arenas of interaction, the exploration of possible future scenarios, and the identification of opportunities and challenges. This reveals opportunities to build on good relationships, promote co-creation, facilitate discussion and interaction, stimulate long-term investment and commitment, and develop awareness of existing businesses. However, challenges are portrayed in the dependence of private land ownership and public support for businesses development, the urge for space availability and affordability, and the lack of operation awareness between neighbors. Hence, it is possible to recommend that place-making strategies should be implemented in a timely manner, within the relevant arena and involving the respective actors. Within industrial urban areas, it is essential to activate businesses to exploit positive interests and prevent place-breakers, while unlocking new opportunities to implement strategies that facilitate community engagement and socio-economic interaction. The implementation of strategies over all of the arenas can enhance the effectiveness to overcome future challenges in the redevelopment of these areas.

Keywords: place-making, urban area development, industrial urban area, mixed-use area, urban manufacturing, scenario planning, city of the future.

Preface

This thesis is the culmination of a one-year process following a research through the cross-domain studio City of the Future and within the department of Urban Development Management of the MSc program track Management in the Built Environment, at TU Delft. Besides, the research has been based upon knowledge from Area Development and Urban Design to provide new insights regarding place-making of industrial urban areas and their redevelopment into mixed-use areas.

This is the result of a fascination with how cities are made and the process of making, which has been placed in the context of industrial urban areas. As a designer, I have always been interested in the process of making and my curiosity led me to research how various actors an influence the way we shape cities based on different interests.

During this time of hard work and great experiences, many people have been a support. First, I would like to thank my supervisors, Tom and Maurice, for their open guidance, feedback and discussions that gave more insights than what I can briefly explain in the thesis. Still, they have motivated me to push forward, reflect and take my own decisions based on strong arguments. I deeply appreciate sharing this process with you and the time taken by you to listen and challenge me.

I would like to thank the coordinators of the studio, Roberto, Alper and Joran, for giving me the platform to explore new ideas with a multidisciplinary approach and enduring the coordination during hard times. Besides, I would like to extend my gratitude to the interviewees and experts for the time to share ideas and experiences for the research, in particular Yawei, Bernardina and Birgit.

Throughout this time in TU Delft, I have made several friends, which are equally or more important as the knowledge I am taking with me. Especially, I would like to thank Fabrizio and Akshit for the time we spent in the faculty working together and the time we spent traveling around The Netherlands. Getting to know this country and the people here has given me great experiences and memories that have shaped my professional and personal perspective.

Finally, but most important, I would like to thank my parents, my sister and Cata for their support and motivation which drives me to pursue my goals and to be confident of my values and beliefs.

Carlos,

Rotterdam, June 2021

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Introduction



Figure 1 Making City (own image)

1. Introduction

The future of urban areas is uncertain; as cities continue to expand and transform, radical changes in daily life make our actions unpredictable. Are we shaping places (un)intentionally? The development of urban areas has become complex given the dynamic forces of people's behavior, environmental and health challenges, local ambitions, and global trends. In the Netherlands, especially in the Randstad region, challenges are accentuated due to the rapid urban growth and various ambitions. While the region tries to overcome living and environmental issues for the upcoming years (e.g., housing and nitrogen crisis), each city has different long-term visions given its own challenges and opportunities. Like other cities in the region, Delft confronts a housing shortage and a rapid urbanization; though it aims to differentiate with the goal of becoming the high-tech capital of the Netherlands through an innovative manufacturing industry. Therefore, how can these ambitions, combined with sustainability and future-proof challenges, could be overcome simultaneously while managing the interests of involved public and private parties, and existing and future users.

Given the scarcity of land and the importance of available infrastructure, industrial urban areas have attracted interest for redevelopment and transformation into mixed-use areas, in particular Schieoevers Noord in Delft. These transformations have been associated with the process of *place-making* to create attractive and successful places with a strong identity, quality and well-being. However, conflicts arise when dealing with the redevelopment of these areas since the ambition to create new living and working conditions is assumed to clash with the existing and future manufacturing activities correlated with given areas. Thus, this research explores the case of Schieoevers Noord to understand the process of redevelopment of an industrial urban area into a mixed-use environment and how to deal with diverse interests within an uncertain future for urban areas, cities and regions.

1.1. Problem Definition

Urbanization is creating new demands for housing, jobs, services, and products, resulting in pressure to transform industrial urban areas into higher-yielding and better uses (Davis & Renski, 2020). The shift to urban areas is contributing to economic growth through economies of scale by increasing productivity and reducing costs to fulfill the demand from the market (Cadena et al., 2011). Verheul (2015) argues that economies of scale have led to uniformity and places that barely represent the local economy while Adams & Tiesdell (2012) refer to this issue as *placelessness*, defined by the standardized landscapes. This results from the obsession to make places that respond to urbanization and global demands, without analyzing the intangible decisions that steer developments towards physical and nonphysical outcomes. Therefore, Adams & Tiesdell (2012) mention *place-making* as an activity that can make "better places through conscious acts of intervention than would otherwise be created" (p. 13). In addition, they explain how emphasis has been done on "first-order" design, consisting of specific buildings, public space or urban furniture, while ignoring "second-order" design that involves the modifications of decision-making environments where development actors operate (Adams & Tiesdell, 2012). However, the transformation of these policies and spatial strategies into suitable and effective actions rely more on building capacity and collaborating in arenas where actors come together for specific issues (Daamen, 2010; Heurkens et al., 2015). Consequently, this tends to be disregarded due to the need to supply new demands fast enough, resulting in place-making strategies that are not being effectively managed if there is not acknowledgement of how (un)intentional decisions produce cities.

Furthermore, Hill (2020) states that historically it is manufacturing that has transformed cities into "great machines of production and opportunity" (p. 37). Nonetheless, fast-urban growth and mass production expose several challenges for manufacturing given the claim for limited space and the complexity of social, financial, and environmental factors in decision-making (Hill, 2020; van den Berghe et al., 2019). Since each context may be different, overcoming these challenges require a process of tailored place-making, rather than a process of mass production like economies of scale.

The scarcity of land in urban areas and the difficulties of integrating peripheral areas have motivated the transformation of industrial urban areas into mixed-use areas (Collaton & Bartsch, 1996; Hill, 2020; Lester et al., 2013). Despite the historical presence of manufacturing activities in these areas, Hill (2020) affirms that industrial urban areas are considered more financially attractive for housing, service, and commercial purposes rather than manufacturing, which is seen as a weaker land use. Although these other activities are drivers in achieving sustainable and mixed-use areas, the tension has been causing the displacement of manufacturing from urban areas, resulting in vulnerable activities without leverage. Borra & Urhahn (2020) argue that manufacturing and activities with social values deserve more attention when facing the claims over limited space and the market pressure. Evading these social, financial, and environmental challenges rather than overcoming them has been translated into a vicious cycle of manufacturing displacement. Adams & Tiesdell (2012) allege that in order to make a place successful, it is essential to encourage their local distinctiveness. Though, can industrial urban areas become successful places without manufacturing activities?

Moreover, manufacturing activities are affected by the normative perception of their environmental nuisance, notwithstanding the efforts to present them as adequate and desirable activities for cities (Collaton & Bartsch, 1996; Hatuka et al., 2017; Hill, 2020;

van den Berghe et al., 2019). Despite having positive intentions, investors and developers cannot find enough arguments to keep existing activities and buildings just because of reminiscence. Arguments must be supported by the use, experience, and future value to work with the existing and the new buildings or activities in sustainable area development (Daamen & Franzen, 2020). Meanwhile, keeping manufacturing activities through protective policies and financial incentives does not guarantee growth in industrial businesses or job creation (Davis & Renski, 2020; Moos et al., 2018). Neither does urban planning alone would facilitate the transformation of industrial urban areas into successful places. Thus, strategies have not been effective enough to transform industrial urban areas into successful mixed-use places.

In addition, urbanization causes higher demand for industrial land to support just-in-time modes of production (Davis & Renski, 2020; Hatuka et al., 2017). The market has been adapting to the constant changes of demand and supply, while socio-economic, demographic, and technological trends have changed the mindset of consumers, resulting in a demand focused on choice variety, convenience, and service (Hospers, 2017). In other words, consumers are looking for manufactured products or services in a global market instead of the local supply, mainly because of convenience, marketing strategies, and technological means. Consequently, these forces have caused an era where "goods increasingly lost their connection to place" (Hill, 2020, p. 36).

In conclusion, the lack of effective place-making strategies to transform industrial urban areas into mixed-use areas, and the limited knowledge of how manufacturers interact with other actors, have exposed the vulnerability to future challenges of these redevelopment processes.

1.2. Relevance

Social

Manufacturing has an important role in the process of local economic growth and community engagement. Hatuka et al. (2017) state "detachment from geography and community is becoming increasingly unsustainable" (p. 148) while Hospers (2017) emphasizes on the importance of making places that "boost the local economy and activate the community" (p. 66). Manufacturing activities historically provide great job opportunities for minorities, lower-skilled workers, and middle-class starters (Davis & Renski, 2020; Lester et al., 2013). Nonetheless, Hatuka et al. (2017) add that urban manufacturing does not depend on low-wage labor, but it is strongly related to knowledge development, technological innovation, and industry specialization. In addition, changes in technology are facilitating manufacturing to be more localized, making places and communities more reachable for manufacturers, rather than relying only on economies of scale within a global market. Urban areas have unique characteristics that are essential for manufacturers, for instance, infrastructure, dense population, and high-value consumer market. Thus, displacement from urban areas can have negative consequences on manufacturing entrepreneurship and scaling up, or even discouraging innovation and a potential transition towards a circular economy (van den Berghe et al., 2019). Breaking clusters of manufacturing activities can erode the value of agglomeration forces, consequently hindering the manufacturers' return and long-term growth (Almeida & Fernandes, 2013; Lester et al., 2013). Likewise, the Covid-19 pandemic has exposed the disadvantages of an unbalanced dependency on the global

market and scarce local manufacturing. For example, the blockade at the Suez Canal by the ship *Ever Given* has had an unexpected and large impact over the global supply chains, but the shock could have been absorbed better with diverse sources of supply (The Economist, 2021). As well, just-in-time modes of production have been challenged by just-in-case modes, resulting in a shift to balancing strategies of production. Hence, unexpected events, for instance the Covid-19 pandemic, reveal the importance of having access to locally manufactured products to support global supply chains (Muzhi, 2020). In other words, raising autarky is becoming urgent to become resilient. Besides, people and organizations are trying to overcome the Covid-19 pandemic to stay competitive in the present and be resilient in the future. There is a need to address the challenges of manufacturing activities and their relationship with future urban areas.

Nevertheless, the social aspirations are harder to achieve without taking into consideration the creation of economic value, given that private interests are drivers in transforming industrial urban areas. Carmona (2014) states "for private developers, an enhanced sense of place adds to the intrinsic value of developments by making them more attractive in the market" (p. 18). However, there are gaps in ensuring business models of transforming these areas while keeping manufacturing activities. There is a need to change towards models where value is shared among the actors involved in the area development growth. Long-term value has to be broken down for developers and authorities to support and enhance these manufacturing activities and find ways to make a positive impact on the embedded networks.

Scientific

Numerous theoretical and empirical research approaches have been done regarding the importance of manufacturing, how has it shaped our cities, and the reasons for its displacement (Collaton & Bartsch, 1996; Davis & Renski, 2020; Hill, 2020; Hutton, 2006; Lester et al., 2013). As well, ongoing research and interest have been focused on the future of manufacturing and how is it going to reshape cities and economies (Agrawal et al., 2020; Blackwell et al., 2017; Davis & Renski, 2020; Hill, 2020; Muzhi, 2020; Scale Cities, n.d.; van den Berghe et al., 2019). On the other hand, given the current trends of globalization and sustainable challenges, discussions have been increasing on the local identity, the future of cities, and the need for urban area transformation (Adams & Tiesdell, 2012; Goffman, 2020; Hospers, 2017; Verheul, 2015).

However, the scientific and non-scientific literature narrowly discuss the impact of future scenarios in the process of redeveloping industrial urban areas into mixed-use areas, considering the role of urban manufacturing. Borra & Urhahn (2020) claim that "ecosystems for work in the city cannot be designed, they are constantly changing - just like the city itself. That is why direction is indispensable" (p. 164). Hatuka et al. (2017) state "manufacturing serves as a lens through which to view and assess the ways that cities adjust to economic competition, demographic growth and rapid urbanization" (p. 153). As well, Hill (2020) introduces the challenge "to forecast what role manufacturing will play in the future" (p. 31). In other words, there is still a gap between the theory of urban manufacturing and urban area development, especially considering the uncertainty of future scenarios. Despite the efforts of implementing place-making strategies and local community engagement, it is not clear if these strategies are really effective on enhancing the conditions for urban manufacturers. Therefore, research is needed to understand the place-making strategies and the conditions of urban manufacturing through an exploration of future scenarios.

1.3. Goal & Main Question

Following the problem definition, the main goal of this research is to identify directions of place-making strategies to overcome future challenges in the redevelopment of industrial urban areas into mixed-use areas, through the interaction of actors in the case of Schieoevers Noord. This will be done through an iterative process of research by design: describing the problem, identifying the forces from theory, analyzing the area, actors, strategy and outcome, visualizing the future scenarios, discussing the empirical findings, and concluding with alternative directions of action. This research aims to shed light on the changing conditions of the redevelopment process of an industrial urban area, and reveal opportunities and challenges in the interaction of actors to direct strategies effectively.

Given this research goal, the main research question is:

How to direct place-making strategies to overcome future challenges in the redevelopment of industrial urban areas into mixed-use areas, through the interaction of actors in the case of Schieoevers Noord?

1.4. Method

To answer the main research question, a research by design is proposed. This approach facilitates transcending from conventional frameworks of area development and urban design. Berkers (2020) emphasizes the added value of research by design by uncovering challenges and issues from the decisions taken by the involved actors. In order to follow this approach, a theoretical framework is needed to define concepts, identify gaps and overlaps, and analyze forces that influence manufacturing and industrial urban areas. These concepts and forces are used to formulate future scenarios within different arenas of actor interaction. Moreover, empirical research is needed to analyze the case and create an input for scenario planning. The empirical research will be done through an in-depth case study analysis of the redevelopment process of Schieoevers Noord. Analyzing theory from a literature review with data collected from case documentation, meeting reports and interviews, will define aspects to be considered. Besides, discussing the current strategies and future scenarios is expected to reveal unknown challenges and possible alternative directions for the process. Thus, the research by design is used as a diagnosis rather than a plan (Berkers, 2020). Daamen & van der Linden (2020) highlight the importance of research by design as a strategy, in which "integral solution directions for 'wicked problems' can be explored in areas relatively quickly" (p. 21). This facilitates the visualization of possible pathways and exploration on how can the cities of the future continue to be drivers of production and opportunity while overcoming these challenges in industrial urban areas.

1.5. Case Study

Schieoevers Noord is an industrial urban area within the Schieoevers district in Delft, which has been overtaken by the city due to urbanization, just like most of this type of areas in urbanized regions. At the time of this research, Schieoevers Noord is undergoing a redevelopment process after several unsuccessful initiatives from public and private parties in previous years. According to Gemeente Delft & Broekman (2019), Schieoevers has been characterized too long for being an area standing still. Therefore, following a research by design would be relevant since it is usually applied "when an existing plan or policy has stalled" (Daamen & van der Linden, 2020, p. 21).

The central location between the train stations and its proximity to existing facilities and TU Delft shows potential for a mixed-use development. There are opportunities for strengthening the innovative manufacturing industry because of its history, infrastructure, and location near TU Delft (Gemeente Delft & Broekman, 2019b). Therefore, this area is seen as a means to leapfrog Delft from a knowledge city to the high-tech capital of the Netherlands (Gemeente Delft, n.d.). Nonetheless, Heurkens et al. (2015) have already discussed before the challenges for making a knowledge city, given the difficulty of transforming these policies and spatial strategies into actions. Thus, emphasis should be made on building the capacity with the private sector to develop an effective urban strategy for the city (Heurkens et al., 2015). According to Daamen, (2010) an effective strategy "anticipates change and involves all actors who depend on each other in making well-considered and timely decisions" (p. 221).

Schieoevers Noord plays a crucial role in overcoming challenges at regional and local scales regarding housing, energy, mobility, and manufacturing (Gemeente Delft & Broekman, 2019b). Having the innovative manufacturing industry as one of the main drivers for the transformation, the area is relevant to the scope of the research. Besides, foreseeing possible future scenarios for the redevelopment of this industrial urban area into a mixed-use area is expected to reveal potential opportunities and challenges that can be the basis to answer the main question.

Methodology

2. Methodology

2.1. Approach

This research builds upon different sources of knowledge of management, urban manufacturing, and urban design. First, the *Urban Development Management* (UDM) program is used as a starting point to research an urban area. Within UDM, area development is a growing field that focuses on combining concepts from "urban planning and design, property development and related professions" (Van Bueren et al., 2016, p. 281). This perspective facilitates an integrated approach to spatial, social, economic, and environmental dimensions. Thus, the research is supported on the UDM 4P model that aims to breakdown the main elements of urban area development (Van Bueren et al., 2016): Person, Place, Product and Process. This framework facilitates the analysis of each concept individually but keeps a holistic perspective on how to "produce and promote an urban environment that meets the demands of sustainability and resilience" (Van Bueren et al., 2016, p. 284).

For the purpose of this research, the four P of the model are described as: (see Fig. 2.1)

Person

Actors: people involved in the intervention, as individuals or representing an organization. In this research, Actors refers to the manufacturers as well as others involved in the network, for instance developers, investors, local authorities, and neighbors.

Place

Area: spatial and situational context influenced by historical and locational qualities. In this research, Area refers specifically to industrial urban areas, specifically Schieoevers Noord.

Product

Outcome: (non)physical outcome of the process. For the purpose of this research, the outcome refers to a mixed-use area, including both physical elements and the activities they foster.

Process

Strategies: Interactive decisions and actions taken by the actors to shape the area-based project, both intentionally and unintentionally. For the purpose of this research, the strategy will refer to the process of place-making.

Furthermore, the research is done through the graduation studio *City of the Future* (COTF), which enables exposure to other disciplines and improves the awareness of designing for future scenarios. Berkers (2020) mentions that "urban development is a game of continuity and change" (p. 14). To portray these changes, a process of scenario planning is proposed to describe future scenarios. Adopting this idea adds another layer of complexity for the research but it is essential to deal with the uncertainty of "wicked" problems.

Finally, the research is explored through ideas from Hill (2020) in *Foundries of the Future* since it allows to have an informed perspective regarding the aspects of urban manufacturing, and how it shapes cities. Hill (2020) manifests that urban manufacturing is a complex arena and dynamic system, which has constant changes affecting other aspects of urban development. Therefore, they argue that actions are needed to make manufacturing an influential part of cities. Besides, it is suggested that urban manufacturing has three pathways for research: urban integration, circularity and technology, and people, networks and policy. Due to the nature of the research, emphasis is done on people, networks and policy, to understand interactions between actors within the concept of urban manufacturing.

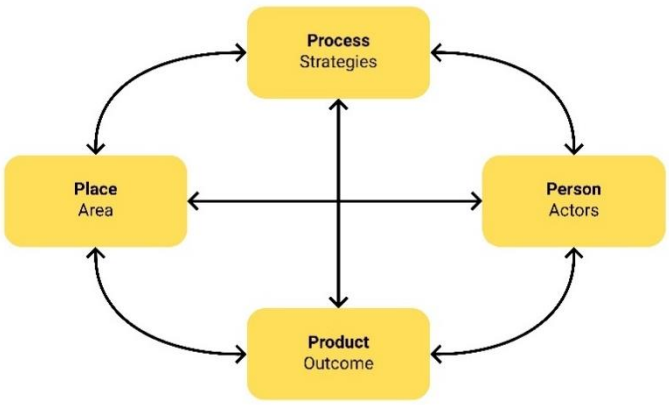

Figure 2 - 4P Model (own image based on van Bueren et al., 2016)

2.2. Conceptual Model

Based on the UDM 4P model it is possible to identify the relations between main concepts of the research. This is done through a conceptual model that supports the methodology (see Fig. 3). For this research, emphasis is done on how the conditions of Schieoevers Noord can influence the process; or how can it be shaped by the interaction of actors within different arenas. Daamen (2010) refers to an arena where actors from different networks interact for a specific issue and common interest, without being a closed or limited network of actors. This open network is formed by actors involved at different scales and time, and coming from different sectors. Within the arena, the dynamic relationship between what actors do and the situated conditions in which they are (un)able to do it is defined as agency and structure (Daamen, 2010). Carmona (2014) refers to the power relationship between agency and structure as the core of the "urban design – place-shaping- process, dictating the flow and function of the process itself, and the nature of its outcomes" (p. 30). Though, the long-term development of the arena also gets influenced by surrounding driving forces (Lindgren & Bandhold, 2009a). To anticipate changes, it is key to identify forces and trends that may affect the arena in time and space, therefore creating a wide range of possible future scenarios. Furthermore, a future mixed-use area consists of possible physical and non-physical outcomes but this concept should be clarified through theory and empirical evidence since it is an expectation rather than a given. Besides, the place-making strategy is analyzed by the (un)intended actions made by the actors, which can steer the process towards diverse directions.

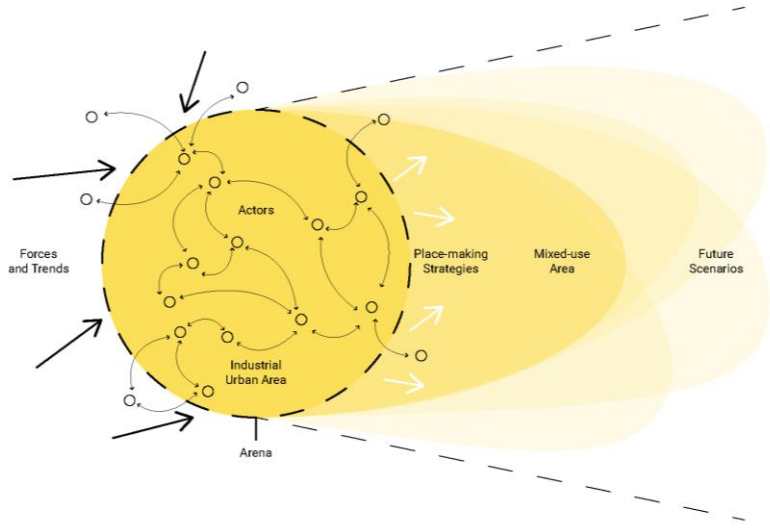

Figure 3 - Conceptual model (own image based on van Bueren et al. 2016; Daamen, 2020)

2.3. Objectives

The main research question sets a primary goal for this research, though it is necessary to set achievable objectives to answer the question. This is done by breaking down the conceptual model into sub-objectives. First, to analyze the arenas in which actors interact in specific area conditions. Second, to identify possible future scenarios based on underlying forces of manufacturing and industrial urban areas. Third, to identify opportunities and challenges based on empirical analysis and possible future scenarios. These objectives are represented in the following sub-questions:

S.Q.1. Which are the arenas of actor interaction in Schieoevers Noord?

What are arenas?

Who are the actors involved and what are their interests?

What are the spatial and socio-economic conditions of the area?

What is the expected physical and nonphysical outcome?

What actions have been taken throughout the process?

S.Q.2. What are the possible future scenarios for Schieoevers Noord?

Which forces and trends are influencing urban manufacturing?

What possible scenarios are driven by unpredictable forces with high impact over urban areas?

S.Q.3. What are the opportunities and challenges based on empirical findings and future scenarios for Schieoevers Noord?

What are the possible (dis)alignments between current strategies and future scenarios?

2.4. Research Design

This research aims to support designers, planners and policy-makers, and inform developers and investors in decision-making environments of a place-making process, specifically in the redevelopment of industrial urban areas into mixed-use areas. This is done by generating knowledge upon theory and practice of a specific case. Analyzing the case of Schieoevers Noord allows exploring integral solution directions for future challenges. Daamen & van der Linden (2020) suggest that research by design facilitates this exploration for such "wicked" problems. Susskind (2013) mentions the importance of shifting from theory to practice, and analysis to prescription to have a complete and in-depth study of a single case. Thus, the research design is based on the *Circle of Engagement* of Susskind (2013), which is used as a reference on how to link the worlds of theory and practice (see Fig 4). Nonetheless, for this research, time is added to ensure the achievement of deadlines instead of staying in a theoretical circle, thus the closed-loop becomes a flow process diagram (see Fig. 5). The research is taken as a making process itself, rather than just looking at the theory of area development and urban manufacturing. This means that the research will shift from thinking to making constantly in an iterative process. Therefore, the process is inspired on ideas from *The Craftsman* by Sennett (2008), in which emphasis is done on problem-finding rather than problem-solving, allowing to explore the *Why* and the *How* simultaneously.

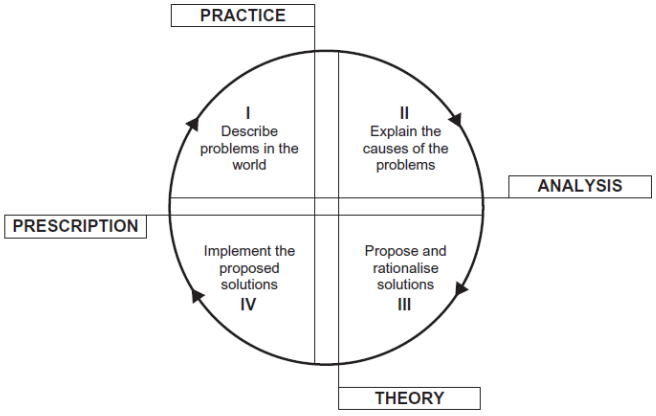

Figure 4 - Circle of Engagement (Susskind, 2013)

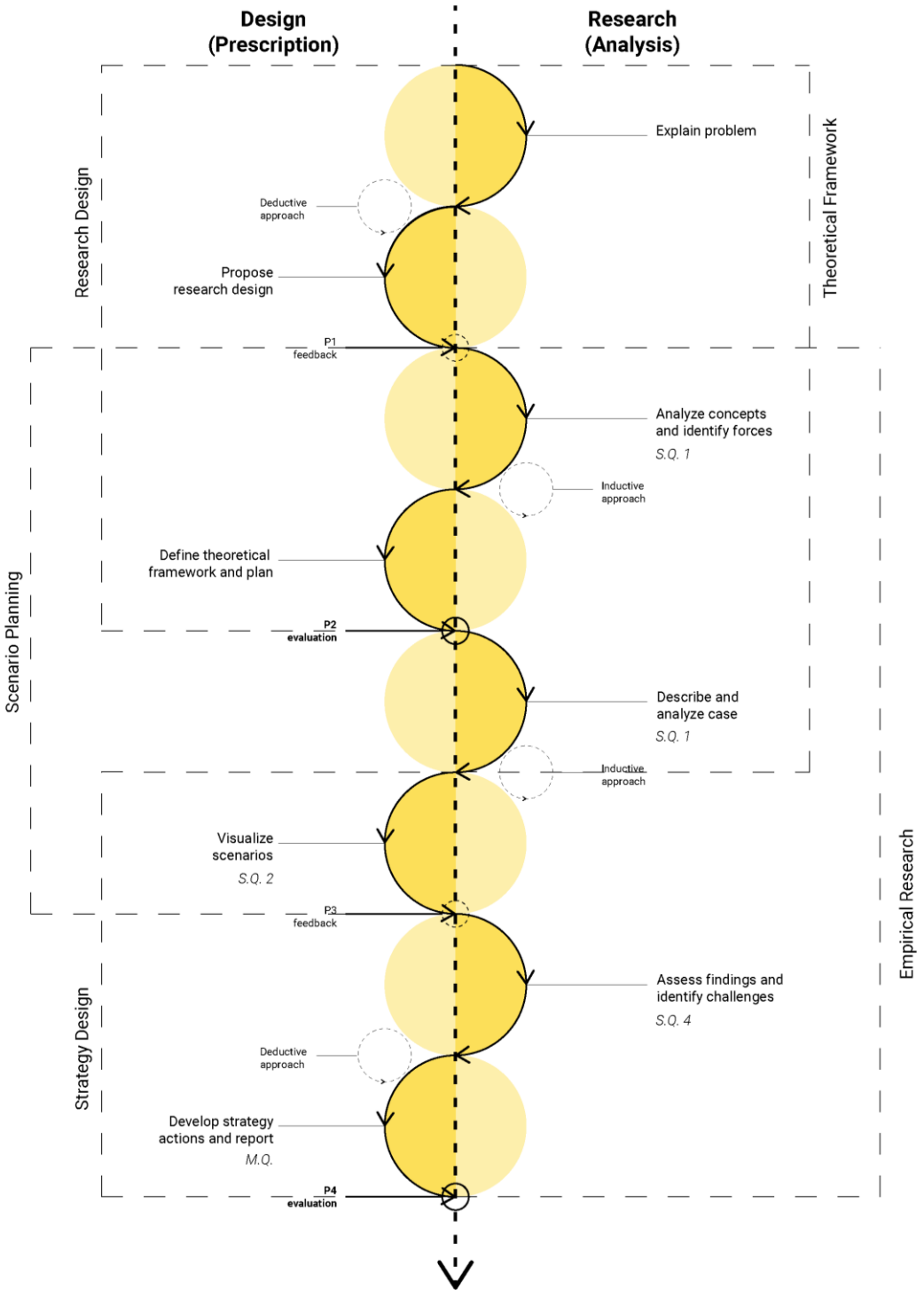

Figure 5 - Research design approach (own image

2.5. Methods & Data Collection

This research by design method will mainly have a qualitative approach. As stated by Bryman (2012), qualitative research is significant because of its inductive perspective, observing evidence to formulate theory and concepts. However, it is not exclusively an inductive research, since the process requires to have a deductive approach at given moments, going from theory to data. Moreover, Bryman (2012) mentions that qualitative research allows the researcher to adopt the perspective of the participants. Since the aim of the research is people (e.g., developers, policy-makers, users), their interests, challenges, and opportunities, the qualitative research facilitates a better understanding of their position. Besides, this research approach is more open to finding social factors that are key in the process of place-making, for example meaning and experience, though findings could also be translated into possible opportunities for economic purposes within public and private development.

The different methods used throughout the research are explained in the following description of the process:

· Explain the problem from a literature review on the themes of area development, place-making and urban manufacturing. *Foundries of the Future* from Hill (2020) and *Shaping Places* from Adams & Tiesdell (2012) are used as a starting points given their topic relevance and timeliness. In this step, the problem definition and relevance are done based on existing gaps in market and scientific literature.

· Propose a research design based on theory from literature and case documentation of Schieoevers Noord. Through this shift, a deductive approach is done to test specific ideas and their viability for the research.

· Analyze the main concepts using theory to identify underlying forces that influence them. After the first feedback session (P1), an in-depth interview, with an inductive approach, is conducted with a policy-maker consultant involved in the case to collect more information.

· Define theoretical framework and plan after the literature review. The research plan and framework are presented to be assessed in the first session of evaluation (P2)

· Describe and analyze the area conditions, actor network, desired outcome and intended strategies with the UDM 4P model. Data is collected through an inductive approach, analyzing case documentation, meeting reports and in-depth interviews. Besides, a penta-helix stakeholder diagram, a power-interest matrix and spatial mapping are used to consolidate findings. After this process, S.Q.1 can be answered.

· Visualize possible future scenarios. This is done by following a scenario planning and describing the possible future scenarios. In this process, S.Q.2 can be answered.

· Assess empirical findings and possible future scenarios. In the second session of feedback (P3), discussing the empirical findings with scenarios will facilitate the identification of challenges and opportunities. Thus, this process will answer S.Q.3

· Conclude with alternative directions and design the report. After discussing the empirical findings and scenarios, conclusions can be made to propose possible alternative directions. During this process, M.Q. can be answered.

After following these steps, the last evaluation session (P4) is reached to present the output. This is not a final result but a production of alternative directions to overcome future challenges in the redevelopment of industrial urban areas into mixed-use areas.

As mentioned before, data will be collected from case documentation, meeting reports and in-depth interviews. The interviews will facilitate having a qualitative and inductive approach and they will be conducted on actors from different perspectives, namely development managers, policy consultant, area manager, business manager, experts and other individuals that may portray the perspective of the users. In addition, meeting reports allow to have a wider range of stakeholders and experts, for example urban designers, planners, architects, developers and existing users of the area. The meeting reports are taken from the participation process of Schieoevers Noord and give a better insight into the actors' roles and actions, the current strategies, and the possible challenges encountered throughout the process. The participation meetings took place online from January 13th to February 11th of 2021 and follow different themes: working and living, quality of life, and accessibility (Schieoevers Noord, n.d.). The interviews and reports allow the compilation of perceptions and ideas across the whole actor-network, enabling a stakeholder analysis. After visualizing scenarios, findings from the interviews and participation meetings can be discussed to identify the challenges and opportunities of the process. Regarding case documentation, data is collected from the development plan, vision document, and spatial quality framework of the municipality (i.e., Gemeente Delft), reports from organizations (e.g., BKS and Roots), plans from designers and projects (e.g., Mei Architecten & Kabel District), and commercial documents from developers (e.g., Amvest and Kondor Wessels). This data will enable the process of analysis, mapping, scenario planning, and strategy assessment.

In Fig. 6, a breakdown of methods to be used can be seen. Different methods will be used for analysis and prescription, having a relation to the research design approach described before. Some of these methods can overlap to have an integrated approach to the sub-questions and main question. In the section Appendices, the list of interviewees and participants of meetings can be seen; besides, interview protocols used for the in-depth interviews are presented.

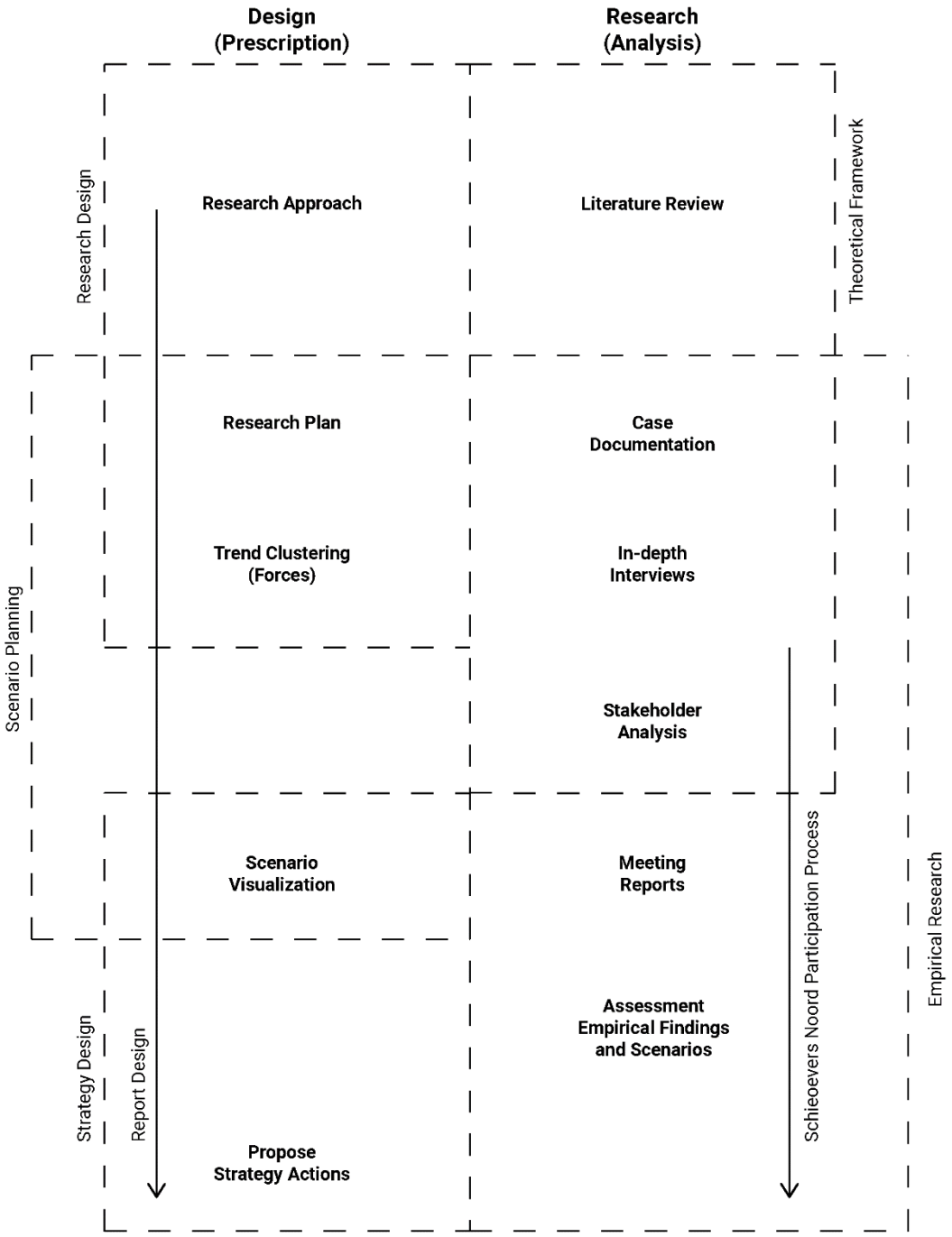

Figure 6 - Research methods (own image)

Theoretical Framework

3. Theoretical Framework

Before taking a closer look into the case, a literature review is done regarding few concepts that are relevant to establish a basis. First, a review is done on urban manufacturing and the forces that influence manufacturers. Identifying the forces allows having a better picture of the manufacturer involved in urban areas. Furthermore, industrial urban areas are briefly discussed to understand the typologies of industrial spaces and historic trends. Then, a literature review of mixed-use area and place-making is done to establish a relation. Finally, a framework is presented based on interpretations and relations taken from theory.

3.1. Urban Manufacturing

The concept of urban manufacturing has received recent attention to clarify its role in today's society and economy, especially in mixed-use urban areas. Manufacturers have been traditionally individuals, groups, or organizations that transform physical material into a product through labor, tools, and machines and produce at scale (Hill, 2020). Hill (2020) discuss that the manufacturer has been associated with the concept of *the maker* that usually relates to artisan activities. Though, linking manufacturers to production at scale or artisan activities makes the term too broad to pinpoint a specific type of manufacturer. Hence, understanding the contemporary manufacturer is essential to imagine the future of the activity. Given the trend of urbanization, a recent growth of urban manufacturers have been found in cities that provide beneficial conditions, in particular "a dense network of specialized firms, highly trained workers and high-value consumer markets" (Davis & Renski, 2020, p.433). On the other hand, Hatuka & Ben-Joseph (2017) explain that urban manufacturers are important in stimulating production in cities with lower economic opportunity, generating job and revenue growth, and improving livability through place-making. Hill (2020) define the urban manufacturers as those that are city-oriented and undergo processes which fit into the urban fabric in aspects of scale, logistics and impact on the contextual conditions. Borra & Urhahn (2020) argue that not every manufacturer is really city-oriented since some cannot be mixed easily with housing and others should be respected due to their high environmental category. It seems inevitable that urban manufacturers are businesses related to the process of making both products and cities, but they are influenced by various forces created by the policies, market and technology. This makes some manufacturers dependent on the context conditions, but some are more vulnerable to changes than others. This research uses the term manufacturer referring to companies, organizations and individuals that operate making products and offer services. Sometimes the term business will be used to group together with related or neighbor companies, unless it is explicitly mentioned that they have large-scale operations or a high environmental category.

Based on an inductive approach to the literature review, the following are nine forces that are currently influencing the activity and can change the role of the manufacturer in different future scenarios (see Fig. 7).

Forces	Trends	Sources
Diversity	Sectoral diversity	Almeida & Fernandes (2013)
	Diverse operations in service and manufacturing	Hatuka et al. (2017)
	Diverse job opportunities	Hill (2020)
	Diverse activities	Van den Berghe et al. (2020)
	Diverse firms and buildings	Hutton (2006)
Craftsmanship	Artisanal production	Hutton (2004; 2006)
	Artisanal activities	Hill (2020)
	Sustainable craftsmanship	Campana & Cimatti (2013)
	Artisanal manufacturing	Lester et al. (2013)
Industry 4.0	IoT, additive manufacturing, technological platforms	Culot et al. (2020)
	Iot, blockchain, additive manufacturing, VR	McKinsey & Company (2020)
	Additive manufacturing	Hatuka et al. (2017)
	Distributed manufacturing	Hill (2020)
	Additive manufacturing	Markforged (2020)
Ecosystem	Ecosystem of partners	McKinsey & Company (2020)
	Ecosystem of people	Hatuka et al. (2017)
	Business ecosystem	Hill (2020)
Proximity	Competitive advantage of proximity	Hatuka et al. (2017)
	Proximity to consumers	Hill (2020)
	Proximity to large markets	Brülhart & Mathys (2008)
	Proximity to other local sectors	Almeida & Fernandes (2013)
Competitiveness	Competitive advantage by people	Hatuka et al. (2017)
	Financial and skill competitiveness	Hill (2020)
	Skills, creativity and improvement	Campana & Cimatti (2013)
	Land conversion for competitiveness	Lester et al. (2013)
	Manufacturing performance	McKinsey & Company (2017)
Knowledge Development	Knowledge spillover	Almeida & Fernandes (2013)
	Knowledge transfer	Hatuka et al. (2017)
	Knowledge sharing	Hill (2020)
	Knowledge spillover	Lester et al. (2013)
Personalization	Mass customization	Culot et al. (2020)
	Mass customization	Hill (2020)
	Product customization	McKinsey & Company (2020)
	Personalized products	Muzhi (2020)
	Highly personalized small scale production	Campana & Cimatti (2013)
Localization	Community and place	Hatuka et al. (2017)
	Local economic structure	Almeida & Fernandes (2013)
	Resilience of local economy	Hill (2020)

Figure 7 Forces influencing manufacturers (own image)

Diversity

Hatuka et al. (2017) emphasize that separating a manufacturer and a service provider is a mistake regarding the current state of the economy. Manufacturers have diversified by offering services with the products or even product as a service (Culot et al., 2020; Hatuka et al., 2017; Hill, 2020; Lester et al., 2013). Hill (2020) discusses how this diversification has created diverse job opportunities in the sector. Almeida & Fernandes (2013) support that "regional diversity in the sectoral composition is associated with faster long-run growth" (p. 2211). Besides, van den Berghe et al. (2019) mention the diversity of activities as a trend for the new emerging industries, while Hutton (2006) considers the diversity of firms and buildings as key in the development of the inner-city.

Craftsmanship

Hutton (2006) introduces artisanal production as part of the new economic development in the inner-city. Hill (2020) refers to this artisanal production as the artisanal activities or maker movement that has been linked to urban manufacturing. For instance, in The Netherlands, these artisanal forms of manufacturing have brought life back to struggling areas (Hill, 2020). On the other hand, Campana & Cimatti (2013) urge the importance of slow factory or sustainable craftsmanship like a new paradigm of manufacturing that "embraces innovation to satisfy the new needs of the market" (p. 275).

Industry 4.0

The manufacturer is already attempting to innovate processes and offer according to consumer demands. Culot et al. (2020) recognize that consumers are "turning into prosumers that co-create products and services with companies through the internet and 3D printing at home" (p. 7). Moreover, technologies, namely additive manufacturing, blockchain, virtual reality (VR), and Internet of Things (IoT), are transforming manufacturers and supply chains, thus developing the Industry 4.0 (Agrawal et al., 2020; Culot et al., 2020; Hill, 2020; Markforged, 2020).

Ecosystem

Emphasis has been done on the importance of an ecosystem approach in the manufacturing business models and supply chain (Agrawal et al., 2020; Culot et al., 2020; Hill, 2020). Hill (2020) states that "cities should therefore encourage locally-rooted innovation to develop business ecosystem from within the city" (p. 53). Developing an ecosystem concept is essential for a city and a region to depend less on traditional manufacturing and create opportunities for "hybrid manufacturing-service firms" (p. 147). Furthermore, Borra & Urhahn (2020) make reference to the term of ecosystems of work to highlight how systems can be created by different work activities that influence each other. They present different types of work ecosystems: hybrid work-living that can mix well; clusters with high environmental category that should be respected; and specialized mixed clusters that cannot mix well with living conditions.

Proximity

Hatuka et al. (2017) state "proximity to firms in the same or related industries improves firms' access to 'specialized workers, suppliers, and customers' as well as the institutions that support their work (e.g., universities)" (p. 146). Hill (2020) highlights the trend of manufacturers to have proximity to consumers, while Brülhart & Mathys (2008) describe it as proximity to large markets. On the other hand, Almeida & Fernandes (2013) argue about proximity to other local sectors. For instance, sectors could be supportive services or even knowledge institutions. Hatuka et al. (2017) stress the need to acknowledge that proximity facilitates competitiveness and knowledge development.

Competitiveness

"Competitiveness and proximity are becoming interdependent" (Hatuka et al., 2017, p. 147). Hatuka et al. (2017) recognize that people in the manufacturing sector are an essential factor in the competitive advantage of cities. Campana & Cimatti (2013) consider skills, creativity, and improvement as key for competitiveness, while Hill (2020) and Blackwell et al. (2017) acknowledge the need for financial competitiveness and manufacturing performance to keep up with the market.

Knowledge Development

Almeida & Fernandes (2013) and Lester et al. (2013) introduce the concept of knowledge spillover within the same sector or different sectors as key for knowledge development. Nonetheless, Almeida & Fernandes (2013) recall that knowledge spillovers may be more influential in sectors with rapidly changing technologies and nontraditional processes. Hatuka et al. (2017) and Hill (2020) support these ideas with the concepts of knowledge transfer and knowledge sharing, both needed for development and innovation.

Personalization

Muzhi (2020) highlights that to get closer to consumers, manufacturing will become more "personalized and localized"; recalling how consumers are beginning to value emotion, personality, and interactivity with manufacturers. Campana & Cimatti (2013) consider high personalization at a small-scale production. Besides, Carpi et al. (2019) claim that the value of manufacturing hinges on the people rather than just the tools or technology. Although, it is the technology that can enable mass customization to scale-up businesses and stay competitive (Culot et al., 2020; Hill, 2020).

Localization

Despite the prompt globalization and offshore production of the last decades, trends of localized production have been rising. (Hatuka & Ben-Joseph, 2017) state "new thinking in supply chain management, especially in regards to local production, is beginning to take root, supplanting modernist concepts of separating production" (p. 21). Moreover, Hatuka et al. (2017) emphasize the power of localism by mentioning the increasing importance of community and place for manufacturers. Almeida & Fernandes (2013) argue the importance of a local economic structure while Hill (2020) is currently pressing the need for a resilient local economy to deal with the unforeseen challenges.

The nine forces identified are not meant to be exhaustive, though are crucial in understanding how can the industry and the role of the manufacturer can change for the upcoming future. Some of these forces are interrelated, for instance diversity of services and new artisanal production has enabled the integration of manufacturers in the inner-city. New technologies of the industry 4.0 are transforming supply chains, which make alterations in the ecosystem and how the system works according to the activities. Besides, proximity of related activities is connected to the creation of a competitive advantage or knowledge development. In addition, localization of manufacturing activities creates a closer interaction of manufacturers and consumers, resulting in possible ways for personalization. On the other hand, some forces may contradict themselves because proximity involves the closeness to related or supportive services, but to what extent diversity of activities in a compact area can hinder the advantages of similar firms stimulating competitiveness and knowledge development. Therefore, each of these forces has different degrees of steerability and impact on urban development. The forces will be used in the section of scenario planning to operate with the most suitable for the specific case of Schieoevers Noord.

3.2. Industrial Urban Area

An industrial urban area has unique conditions in comparison to any other area within a city. The conditions of an area are the underlying characteristics of the place that define the spatial and socio-economic dimensions. Carmona (2014) introduces two main contextual factors that shape a place through time: history and traditions. These factors influence how the process of urban development unfolds; decisions taken over time and place have made the current conditions which can be work with. Regarding industrial urban areas, the conditions are defined by the historic industrial activities, namely manufacturing. Lester et al. (2013) mention that these areas offer competitive location for manufacturers due to traditional location factors like transportation infrastructure, consumer markets and access to labor and suppliers. Nonetheless, Lester et al. (2013) recognize that areas for industrial use have been reduced in cities, resulting in a need to be more strategic on how these areas can be redeveloped to achieve economic goals of the city and the region. Hill (2020) argues that these areas are the result of how manufacturing and urban areas have evolved during the 20th century, laying foundations of infrastructure used today, and which some are now in unstable conditions due to the technological, environmental and economic impact on the sector. Hatuka & Ben-Joseph (2017) define three prototypes of industrial spaces: integrated, adjacent, and autonomous (see Fig. 8). These prototypes as a whole reveal the increasing separation from the city and the relationship between industry and city on economic, political and spatial development. Besides, the three prototypes differentiate on the living conditions they foster, going from a symbiosis of living and working in the integrated, to a separation in the adjacent, and almost nonexistent or reduced living in the autonomous. Hatuka & Ben-Joseph (2017) argue the prototypes reveal three historical trends. First, the trend of shifting away from the city while depending on the global economy and an autonomous model, but independent of location. Second, the trend of having a centralized management with international companies and industrial parks that have an impact on the local economy. Last, the creation of specialized industrial environments that associated with innovation, clean science and becoming "out of place" but connected to the global dimension.

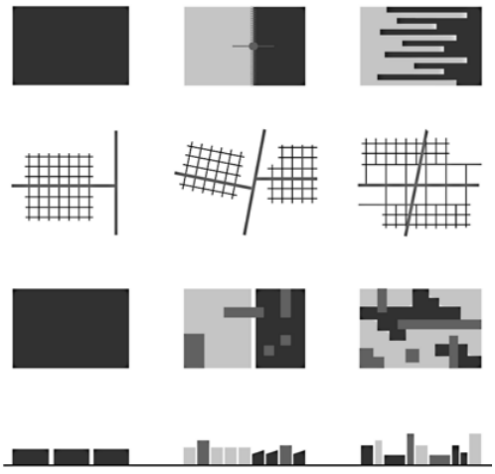

Figure 8 - Prototypes of industrial spaces (image from Hatuka & *Ben-Joseph, 2017)*

Nonetheless, currently, cities are realizing the importance of reintegrating manufacturing within the urban fabric, just like living and commercial activities. Changes in technology and processes are facilitating the promotion of manufacturing in urban development of future cities. However, technology and market changes can shift faster than traditional processes of manufacturing or even the existing built environment and infrastructure of an area. In other words, manufacturing activities and industrial real estate struggle to adapt to new demands and conditions in urban areas. Furthermore, Hill (2020) refers to three pathways to enhance urban manufacturing, namely people, networks & policy, urban integration, and circularity & technology (see Fig.9). Also, they introduce fifty patterns across these pathways and five different scales to work on: transcalar, city/neighborhood, neighborhood/block, block/building, program. Nevertheless, Daamen & Verheul (2018) emphasize on the challenge of redeveloping industrial urban areas, in particular Schieoevers Noord, due to the high dependence on interactions and the need to build confidence with the people through process; not only focusing on the spatial characteristics of the product. In conclusion, industrial urban areas reflect a complex arena to manage due to their separated urban development and the specificities of industrial activities, unless more emphasis can be done on the interaction environments between actors.

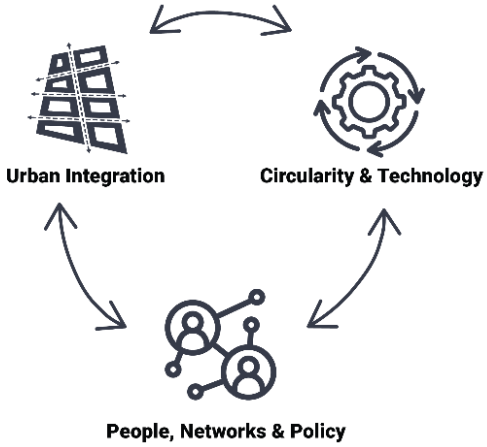

Figure 9 - Pathways for urban manufacturing (own image based on *Foundries of the Future, Hill, 2020)*

3.3. Mixed-use Area

Frequently, one of the main goals of redeveloping industrial urban areas is to transform them from monofunctional areas to mixed-use areas. The concept of mixed-use has been applied
in the last decades as a strategy to create variety and vitality in urban areas through diverse scales and activities (Hoppenbrouwer & Louw, 2005). Nonetheless, Rowley (1996), Hoppenbrouwer & Louw (2005), and Moos et al. (2018) stress that the concept of mixed-use is still ambiguous, and the outcomes of implementing it through policies and planning should still be studied.

Rowley (1996) defines mixed-use development as "an aspect of the internal texture of settlements" (p. 86) and creates a comprehensive model to analyze it through its texture features, spatial scale, and influences (see Fig. 10). Mixed-use development does promote urban quality, attractiveness, livability, and sustainability by creating vitality and diversity, though skepticism grows if it is not well managed and implemented effectively (Rowley, 1996).

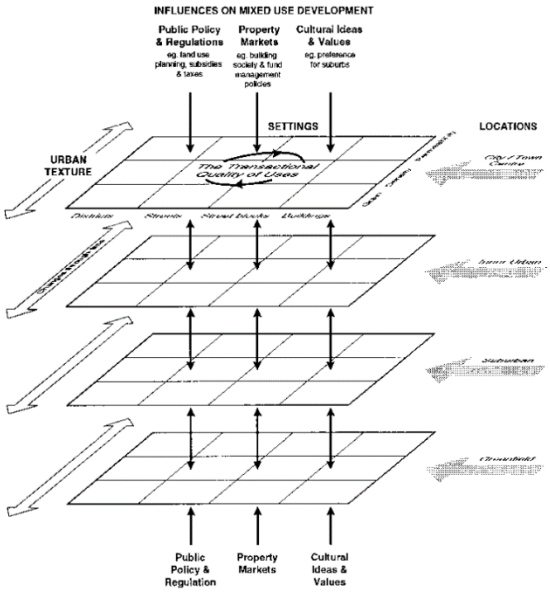

Figure 11 - Mixed-use model (image from Rowley, 1996)

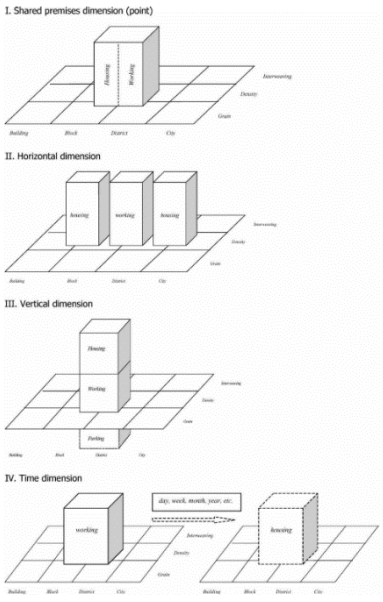

Figure 10 - Mixed-use model (image from Hoppenbrouwer & Louw, 2005)

Assumptions by planners and designers on the virtues of mixed-use development have to change to align with environmental challenges, social needs, and economic interests. Rowley (1996) states "if people are to voluntarily accept mixed-use development as a norm rather than as an exception, they will need to be educated and converted; not just developers and investors, but users, occupiers and purchasers" (p. 94). Despite the advocate tone of "educated and converted", it is noteworthy to mention the need to make, communicate and promote mixed-use development as more attractive and feasible for the decision-makers and the users of the space.

Hoppenbrouwer & Louw (2005) recalls that mixed-use and diversity do not automatically lead to vitality unless people's perceptions are not understood. They support Rowley's ideas but make adjustments by adding the shared premises dimension, the vertical dimension, and the time dimension (see Fig. 11). In their empirical research on Amsterdam's Eastern Docklands, Hoppenbrouwer & Louw (2005) determine that the mixed-use concept can be ambiguous because "the higher ambitions of mixed-use are not met, but the implementation by the local government has been rather successful, as witnessed by the perception of the entrepreneurs. Probably the emphasis on urban design has caused this to happen" (p. 982). In other words, despite not achieving optimum mixed-use as a goal, other strategies implemented have been perceived as successful by the actors involved. More importance should be made on the emergent strategies that urban design enables to tackle challenges rather than using mixed-use as a sole top-down strategy.

Moos et al. (2018) raise concern over the outcome of implementing mixed-use through policies and regulations. They argue that, contrary to planners' expectations, mixed-use zoning could reduce housing affordability, social diversity, and manufacturing activities. Using the city of Toronto as a case study, Moos et al. (2018) suggest that practitioners should be aware of unintentional consequences of implementing mixed-use development without policies for affordable housing or adequate incentives for developers. Besides, emphasis should be made on how to shift towards a knowledge-based economy to prevent increasing inequality and manufacturing decline.

While the three theories have different arguments and perspectives, they share the concern of having mixed-use as a unique top-down strategy for urban transformation. It can be concluded that mixed-use are development planning cannot be used as an independent strategy for urban redevelopment without considering financial feasibility, urban design, emergent strategies, economic policies and incentives, effective communication, and adequate conditions for diverse activities (e.g., manufacturing and knowledge development). Moreover, attention is needed to those environments where strategies are created by decision-makers and those where users perceive the actions taken.

3.4. Place-making

"Whatever space and time mean, place and occasion mean more; for space in the image of a man is place, and time in the image of man is occasion" – Aldo van Eyck

Transforming areas into attractive places is a multi-scale and multi-stakeholder process; not only a task of planners and developers. There is an increasing need for communities and businesses to get involved in the transformation of their neighborhoods to overcome social, economic, and environmental challenges. Since places are influenced and shaped by the people's experience, the *place* is socially constructed and adopts its meaning and value from people (Adams & Tiesdell, 2012; Verheul, 2015). For this reason, area development has been recently linked with the process of place-making through urban design as an essential activity. Carmona (2014) states "urban design represents an on-going journey through which places are continuously shaped and re-shaped—physically, socially and economically— through periodic planned intervention, day-to-day occupation and the long-term guardianship of place" (p. 34). Besides, Carmona (2014) refers to urban design process as a continuum that shapes space for use and through use. Thus, decisions taken in area development are perceived by the users of the space. Adams & Tiesdell (2012) refers to some users as unknown designers that can become place-breakers, instead of place-makers, if they are not taken into consideration. They emphasize the value of urban design on "exploiting positive externalities, neutralizing negative externalities, and creating a much better sense of place than is normally produced by standard speculative development" (p. 14). Verheul (2015) describes the sense of place as "the feeling that people have at places" (p. 36). Furthermore, urban design transcends public and private traditional development and has public space as the main driver for a long-term natural process of urban transformation. Thus, making a place attractive is getting more complex for planners and developers without understanding interactions within the public realm.

According to Adams & Tiesdell (2012) five characteristics facilitate the creation of successful places, but do not ensure it, namely places meant for people, well-connected and permeable places, places for mixed-use and varied density, distinctive places, and sustainability, resilience and robustness. Nonetheless, place-making is also defined by how each actor perceives and captures value. Adams & Tiesdell (2012) acknowledge value as a multi-dimensional concept, which can be exchange value, use value, social value, environmental value, image vale and cultural value. Emphasis is done on the gap between short-term decisions in development and the long-term consequences in investment return, management and the daily occupation. Thus, place-making requires determination, commitment, ingrained culture, and effective leadership and governance to capture the respective value for each stakeholder involved.

Furthermore, Wu (2000) and Martin (2003) touch upon the local and global dimensions of place-making. Wu (2000) reflects on how place-making for Shanghai can be defined by a global strategy taken by decision-makers to promote a local economy, but globalization can be a "double-edged sword" that widens the economy but makes it vulnerable to more market shifts (p. 1375). Besides, Martin (2003) discusses how place facilitates discourse and identity to make community-based and neighborhood-based organizations. Nevertheless, it is the proximity of occupiers in the place that fosters common experiences and interests, not necessarily location. Both global and local dynamics can shape people's experiences and interests, influencing place-making in multiple scales and dimensions.

In contrast to a mixed-use area development, place-making can be seen as an overarching strategy to transform areas into successful places. However, both concepts are interrelated and not mutually exclusive. Mixed-use area development needs a process of place-making to gradually mix buildings, public space and activities, without ignoring the process of shaping and managing the decision-making environments where actors interact for planned intervention or daily operation.

3.5. Framework

As described before, urban manufacturers are actors within area development that can be defined by a wide range of forces, making them hard to define as only one type of actor. Some manufacturers adapt easier to forces while others are more prone to struggle with them, for instance proximity to other activities, diversity of users, new technologies or changes in their ecosystems. However, urban manufacturers have in common the presence in arenas that bring together diverse actor networks consisting of suppliers, consumers, neighbors, investors, landlords and regulators of their operations. In addition, these actors interact in a specific arena that involves shaping industrial urban areas that have been historically characterized as spatially, socially, politically and economically separated from the city. Transforming this particular area into a mixed-use environment has to consider the implications of creating an ecosystem with high diversity of activities and users. This makes the arena intrinsically complex due to the dependence on interactions between the existing actors and new interested parties, including new living and working neighbors. Therefore, the existing network in the area would inevitably transform, involving new actors that fit in, changing others that are able or willing to do it or replacing those which cannot be embedded within an urban ecosystem.

Furthermore, it is noticeable that an industrial urban area has historical and traditional characteristics that define it. Still, it can be shaped by deliberate intervention or daily use of it. It is this process of place-making that can redefine the meaning of a place. Involving new actors, like residents, changing existing ones or replacing others, would introduce a dynamic of interaction between them. Ideally, mixed-use area development would intentionally increase density and physical proximity between occupiers. It is their interactions, experience and common interests that can shape the perception of the place, not only the location itself; these interactions can be related to social, environmental or economic interests. Therefore, deliberate interventions of planners, policy makers, developers and other decision-makers should focus on supporting positive interactions to achieve a desired outcome and prevent future conflicts.

It is important to make emphasis on the decision-making environments where industrial urban areas are shaped for use and through use to create a living-working environment. These decision-making environments are referred as the arenas in which actors from different networks are encountered to take action. First, “Urban Area Development” is considered an arena where actors, for instance policy-makers, developers and planners, shape space for use through a vision, design, negotiation, policies, and other decisions on property development. Second, “Mixed-use Area” is an arena where space is shaped through use by actors, in particular residents, workers, commuters or even managers, whom operate, adapt, appropriate, and manage in the daily occupation. Third, “Urban Manufacturing” is an arena where space is shaped through use too, but actors are mainly involved in the operation of business networks, for instance producers, service

providers, suppliers, clients. The three arenas come together in the industrial urban area to be developed. These arenas are interrelated and part of the overall process but having a closer look at them separately facilitates identifying the actions taken and then relate them to the whole (see Fig. 12).

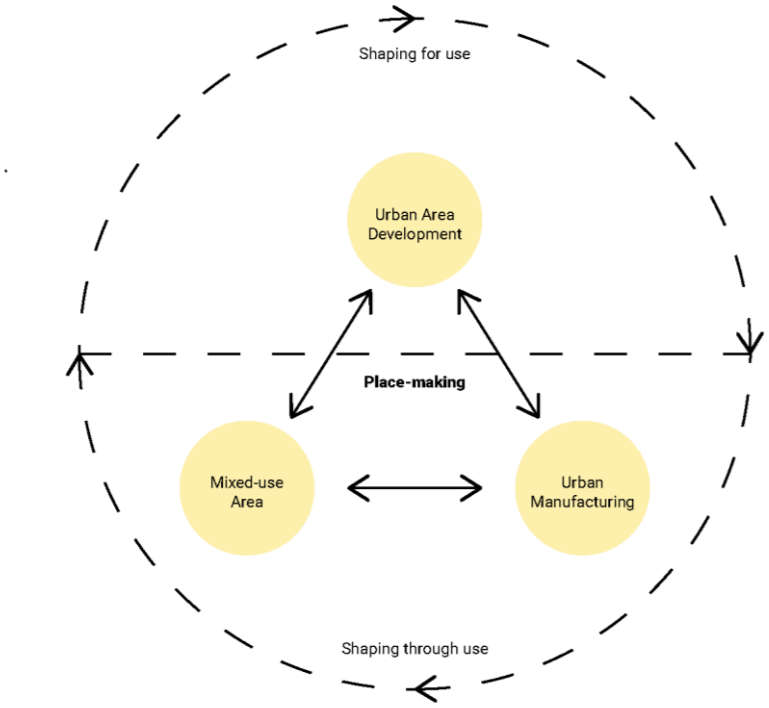

Figure 12 - Theoretical Framework (own image)

Empirical Analysis

4. Empirical Analysis

4.1. Introduction

As previously mentioned, the case of Schieoevers Noord is described through the UDM 4P model consisting of the actors, area, outcomes and strategies. To do so, data has been collected from case documentation, interviews and meeting reports of the participation process. Besides, different tools are used per concept to elaborate the description. First, the actors are analyzed with the penta-helix stakeholder map and the power-interest matrix, describing actors from sectors of public service, knowledge, community, capital and business. Second, the area is described through the city and region, and the conditions of the area itself. Third, the outcome is presented using five different scales, namely transcalar, city, neighborhood, block and program. Last, the strategies are explained through the past (2006-2020) and the present (2021). After the analysis of each element, findings are presented together on the three arenas of interaction of the theoretical framework: Area Development, Mixed-use Area and Urban Manufacturing.

4.1. Person (Actors)

Schieoevers Noord has actors involved at different scales and from different networks of society. Using the penta-helix stakeholder map from Hill (2020), it is possible to identify stakeholders according to the following sectors: Public Service, Knowledge, Community, Capital and Business (see Fig.13). The five sectors have different scales of interest: micro, meso and macro. Besides, some stakeholders can be involved in more than one sector or scale. the following actors are not meant to be exhaustive but they have been taken into account as a sample of the stakeholders involved, according to documentation and empirical evidence. Nonetheless, some other new actors can influence in the future.

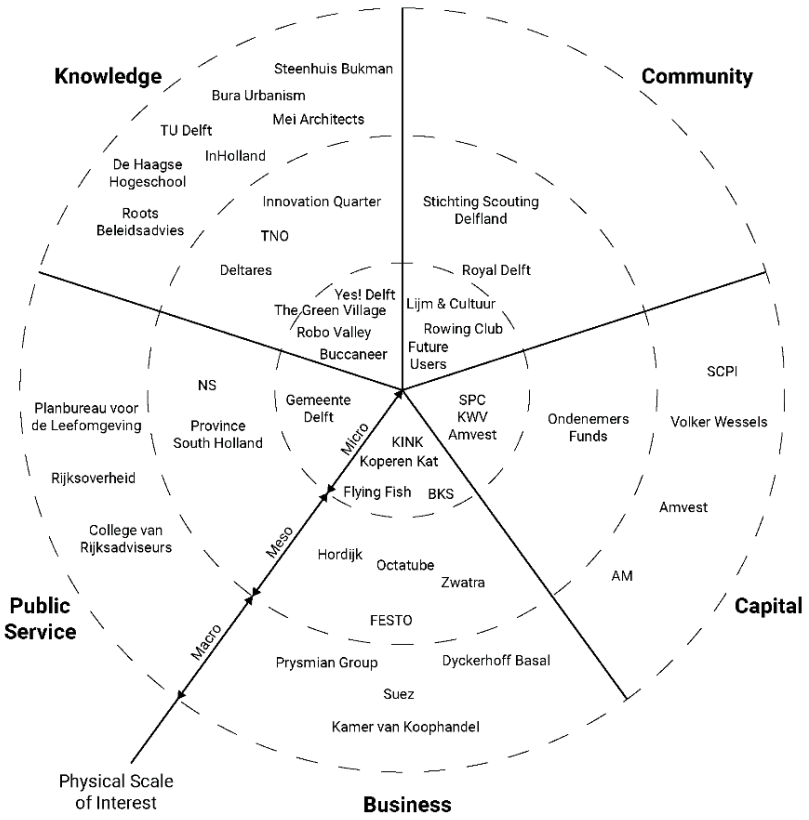

Figure 13 - Penta-helix stakeholder map (own image based on Hill, 2020)

Public Service

Public actors can be divided into the elected officials and the professional workers within the institution. In this case, Gemeente Delft is the main public actor consisting of more than one person and more than one role. The elected officials are focused on the political and policy aspects, forming the City Council. The City Council deals with aligning the vision of the city with the region and the national government through policy making. On the other hand, the professional workers deal with the technical and administrative issues. The area manager describes their role as representing the community but not politically driven nor elected; they are professionals with specific fields within the institution: *"We are the people of the community here…we are not political driven; we are not chosen. We have a job. The Municipality is also not one person or one institution. You have lots of different tastes"* (DS, area manager of Gemeente Delft, 2021). The area manager is concerned of the program and process management of the area development, informing and consulting citizens and companies, developing a framework of socio-economic and spatial goals, and facilitating the discussion between interested parties: *"I've been working for four or five years to really get a relationship with them (businesses)…and working on trusting*

each other…a cooperation together with them" (DS, area manager of Gemeente Delft, 2021). In addition, the business manager works closely with companies to organize meetings and consult about their needs and operations (MM, business manager of Gemeente Delft, 2021).

Gemeente Delft has limited financial and capital power since they do not own private land in the area and rely on a budget from the province, which is usually aimed for housing development: "*the driver for the Metropoolregio Rotterdam Den Haag is pure housing"* (GB, policy consultant for BKS, 2021). However, Gemeente Delft still owns the public space, the province owns the waterway and NS owns the station area. The Province South Holland acts as an intermediate actor between local stakeholders and the interests of the region due to its interest over the infrastructure. For example, a project team member explains how the province works as the waterway manager, facilitating discussion between users, namely Dyckerhoff Basal and the Rowing Club to examine the conflicts of rowers and shipment in the Schie canal: *"With the province as the waterway manager, the location of the shipment (Basal) in relation to the rowers (Rowing Club) has been explicitly examined. The province has indicated that both should get in close contact with each other to discuss"* (PM, project team member, 2021). Furthermore, the decisions taken by the professional workers of the municipality depend on the approval of the City Council based on the regional interests and the policy documents: e.g., Zoning Plan or Environmental Impact Assessment (EIA) (HL, development manager of Kondor Wessels, 2021). Table 1 shows some of the actors involved in the process, their role, contact person and interests.

Knowledge

These actors offer support through knowledge and expertise. They can be academic and research-based institutions, built environment consultants, technology hubs, financial advisors, etc. Some of them have a national and international reach, like TU Delft, Roots Beleidsadvies or Bura Urbanism; a regional interest, like Innovation Quarter; or a localized focus, like Yes! Delft or Buccaneer. For example, the Innovation Quarter reaches different scales by introducing international companies to the region. They work by connecting the companies with the province, TU Delft and Gemeente Delft, and conduct a research on what place fits best the company within the regional landscape*: "Innovation Quarter introduces international companies to the region, to the Province of South Holland and they do the research of what place fits best for the company"* (MM, business manager of Gemeente Delft, 2021).

Furthermore, despite not being physically settled on the area, the presence of TU Delft in close proximity and its strong network, creates an attraction force for companies related to knowledge and technology development. This is one of the reasons Gemeente Delft has the ambition to work towards a high-tech capital: *"There is not only room for that type of companies (related to TU Delft). However, it is a clear objective of the Municipality to work towards a high-tech capital"* (JV, development manager of Kondor Wessels, 2021). The presence of incubators and technology hubs like Yes! Delft or Buccaneer in the surroundings of TU Delft reflect the growth of the ecosystem based on knowledge-intensive companies (see Fig. 14). Therefore, the power and interest of TU Delft seems as high enough to steer the decisions of the other actors. Table 2 shows some of the actors involved in the process, their role, contact person and interests.

Table 1 - Public Service actors

Actor	Role	Contact	Interests
Gemeente Delft	City Council Alderman	Stephan Brandligt	Policymaking on sustainability, work and finance, mainly on becoming the high-tech capital of Netherlands
	Area Manager	Derk van Schoten	Process and program management of Schieoevers
	Economic Affairs	Monique Martens	Communication with companies and facilitating collaboration and discussion
NS	Infrastructure Administration	N/D	Mobility and Accessibility
Province South Holland	Regional Administration	N/D	Alignment of regional vision through policymaking, mainly on housing development and mobility.
Planbureau voor de Leefomgeving	Environmental Assessment Agency	N/D	Framework and criteria to assess issues on urban development, mobility and infrastructure
Rijksoverheid	National Administration	N/D	National policymaking and governance
College van Rijksadviseurs	Council of Advisors	N/D	Advice on mixed-use urban development

Table 2 - Knowledge actors

Actor	Role	Contact	Interests
TU Delft	University	Peter Boulhouwer	Education and research support, specifically on technology engineering, policy and management
Roots Beleidsadvies	Policy Advisor	Gilbert Bal	Regional socio-economic advice for the Bedrijvenkring Schieoevers and intermediary with the Gemeente Delft
Bura Urbanism	Urban Designer, Planner and Architect	N/D	Urban integration and spatial quality, commissioned by Gemeente Delft
Mei Architects	Urban Designer, Planner and Architect	N/D	Urban design commissioned by the Cable District
Innovation Quarter	Technology hub	N/D	Business and technology innovation
Yes! Delft	Technology hub	N/D	Tech business incubation
Buccaneer	Technology hub	N/D	Scale-up growth in energy and offshore

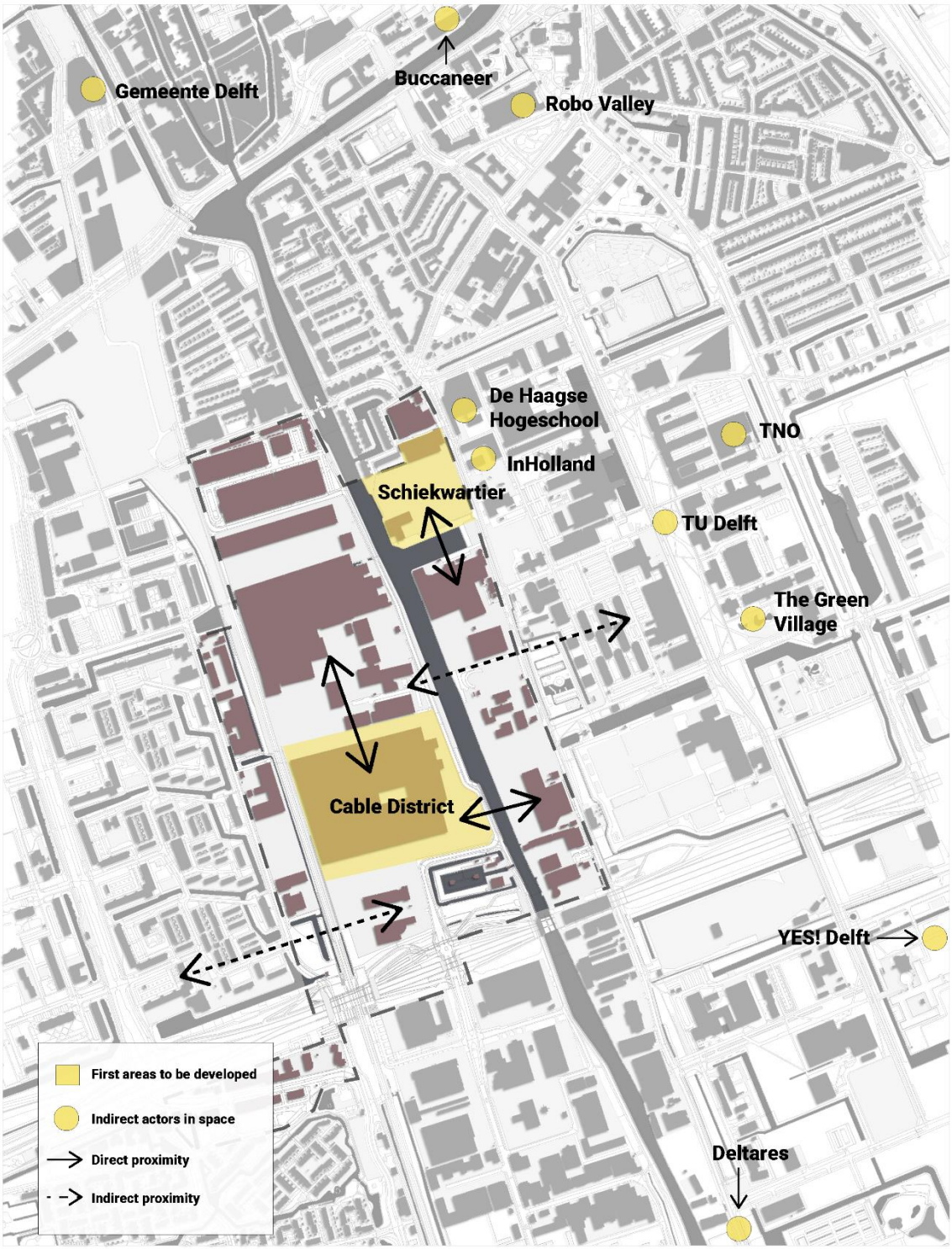

Figure 14 - Map of knowledge ecosystem (own image).

Community

The community concerns the public groups focused on the health and social welfare of the people. These can be non-profit, voluntary, think-tanks, cultural organizations, sport clubs, etc. Based on the available information of the area, there is a lack of strong community organizations due to the absence of living conditions (i.e., no housing). Therefore, a specific person has been assigned, by the Cable District team, the role of "place-maker" to implement place-making strategies based on uses and events within the themes of integrated city, greenery, entertainment and culture: *"…it is important to develop this further with the neighborhood. That is why we want to start communicating with people as soon as possible. Someone special has also been recruited for placemaking…"* (KK, urban designer of ZUS, 2021). Nonetheless, the focus has been mainly done only on the Cable District and using references of a selected target group that differs from the existing users. Therefore, there is some unclarity of how these new users are involved in the development of the whole mixed-use environment. As said by a participant during a meeting, public space is needed for co-creation as well as starting with a hub and a place for the business community: *"I am for co-creations but I wonder if this will come about with the public space. I do think, for example, that a hub or the business community is a good place for this.* (MP, meeting participants, 2021). These future users are unknown at the moment, but it is clear that it is a wide range of target groups compared to the existing users: *"…target groups of these homes. These are the (Delft) starters, transfer students, the elderly and students; in short, a diverse group of people…there is a real battle for space. You see this not only with students but also other groups."* (SB, policy-maker of Gemeente Delft, 2021). Currently, the existing community actors are linked to cultural and leisure activities, namely Rowing Club, Stichting Scouting Delfland, Royal Delft and Lijm & Cultuur; the latter has been emphasized as an important meeting place that offers opportunities for the community: *"Lijm en Cultuur is indeed an important meeting place that is already located here and has a lot to offer. We like to work with that"* (OW, development manager of Amvest, 2021). Table 3 shows some of the actors involved in the process, their role, contact person and interests.

Table 3 - Community actors

Actor	Role	Contact	Interests
Stichting Scouting Delfland	User (Foundation)	N/D	Historical heritage and cultural preservation through activities
Royal Delft	User (Museum and Producer)	N/D	Historical heritage and cultural preservation through craftsmanship
Lijm & Cultuur	User (Activities and Events)	N/D	Entertainment, leisure and cultural promoter
Rowing Club	User (Sports)	N/D	Promote sports
Future Users	User (Living and Working)	N/D	High quality and healthy living environment
Cable District	Placemaker	Nina Voets	Place-making through uses and events

Capital

These stakeholders consist of owners of land, technology or financial capital. Therefore, these stakeholders have high leverage on decision-making: *"…a lot depends on land ownership"* (OW, development manager of Amvest, 2021). Some of them may be existing users of the area, developers, investors or community funds, namely AM, Amvest, Volker Vessels, SCPI or the Ondenemers Funds (i.e., entrepreneurs' fund). The area manager emphasizes on the importance of having a good relationship with the companies that own their property and land, not only developers and investors, and how their role is key in the research about mobility, noise and air pollution: *"Important parties for the Municipality to have a good relationship…all the companies in Schieoevers Noord who have their own property and land. They research about mobility, noise and air pollution…33 apart of the developers on Amvest, Kondor Vessels and AM that are players in this development"* (DS, area manager of Gemeente Delft, 2021)

Furthermore, a special purpose company (SPC) created by Kondor Wessels Vastgoed (part of Volker Vessels) and Amvest is an independent entity created for the specific purpose of owning and developing the Cable District within the area. One of the development managers explains how the project team consists of around 10 people from both companies which are detached from their mother company: *"It's not an Amvest plan or a Kondor Wessels plan, we're team Cable District and we both are like detached from our companies"* (OW, development manager of Amvest, 2021). The group can continue growing in the future given the size and complexity of the project, making it a unique joint venture for both Kondor Wessels and Amvest as investors in the long run. In other words, the SPC is a localized actor from different larger networks, but united by common long-term interest and within a specific arena. Actors like TU Delft and the Gemeente Delft also have financial and technological power, though they are mainly seen as part of the Knowledge and Public groups. Other companies that own land, namely Prysmian Group and Hordijk, are described later in the Business group because their focus is on operations rather than on land and property capital: *"Companies who have their land and property in the area, for them it's very logical to invest in digital operations and more viable, friendly production"* (GB, policy consultant for BKS, 2021). Table 4 shows some of the actors involved in the process, their role, contact person and interests.

Table 4 - Capital actors

Actor	Role	Contact	Interests
SPC (Amvest and Kondor Wessels Vastgoed)	Developer and Investor	Heleen Luijt, Olga Wagenaar	Long term financial interests focused on investment, development and operation
Ondenemers Funds	Investment Fund	N/D	Stimulate the business ecosystem
SPCI	Civil Fund	N/D	International property investment fund
Volker Wessels	Investor	Joost Versluijs	Long term financial interest on investment
AM	Developer	Ronald Daalman	Area development

Business

These actors refer to individual companies and organizations providing a product or a service in the specific area. They can also be an industry lobby or a cluster of companies with similar interests. In this case, the business actors are small companies (e.g., Koperen Kat and Flying Fish), collective workshops (e.g., Kink), large companies (e.g., Octatube and Hordijk), international corporations (e.g., Prysmian Group and Dyckerhoff Basal), or business associations (e.g., Bedrijvenkring Schieoevers or BKS). Each of these actors have different scales of interest and reach, from local neighborhood to global networks, but they come together in a specific place. The BKS has a key role in the area since it is interested in supporting the business ecosystem and network to enhance participation and interaction between the entrepreneurs: *"the Business Association asked to help them with the priority…a goal to stimulate the business area… it (BKS) is driven by the people (in the area) … they are very active in their role…when you speak about place-making, it's about the people. The people are telling the story of Schieoevers Noord"* (GB, policy consultant for BKS, 2021). In addition, the companies and entrepreneurs have been referred as "ambassadors" that tell the story of the area. The business manager explains how Gemeente Delft organizes meetings between new and existing companies of the same or related sectors because they work as ambassadors of the area*: "organize a meeting with other companies of the same or related business…because they are the ambassadors"* (MM, business manager of Gemeente Delft, 2021). One of the project developers of AM discuss *"how you can make a close-knit group and complement each other. Furthermore, the advantage in this project is that you can use them (entrepreneurs) at an early stage and that they can function as a kind of ambassadors, with whom you can also do place-making."* (RH, project developer of AM, 2021)

Furthermore, large scale companies and landowners, in particular Prysmian, Hordijk and Basal, have interests that may diverge from the vision of the area. Both a policy advisor and a development manager mention the importance of attracting companies in high-tech system manufacturing (HTSM) to develop the area as the place for high-tech manufacturing, though this does not apply to large scale manufacturing: *"If you want to develop this area as THE place for high-tech manufacturing, then you have to have this kind of people, who tell about this story"* (GB, policy consultant for BKS, 2021). "*Companies we want to attract are high tech systems (HTSM)…but not on a large scale"* (HL, development manager of Kondor Wessels, 2021). Nonetheless, their presence is inevitable in the area due to their control over land and property through ownership. Hence, a development manager emphasize that they have been in the area for a long time and do not have to leave, but an effort can be made to know each other and find ways to work together:

"…they (Prysmian Group) don't have to leave… we have put in quite a bit of effort in recent years to try and get to know each other a little bit better. Big part of getting to know each other is actually having respect for the people who were there first. Prysmian was there first" (OW, development manager of Amvest, 2021).

Regarding smaller companies, their interest relies on affordable space and capturing talent. A member of a small high-tech company mentions that their interest in the area is based on having affordable rent, opportunity to expand and be close to TU Delft to attract talent from students (e.g., DREAMS hall) and work with the university as a client: *"we are here because it is cheap, we can grow and we can work with TU Delft. Also, we try to attract friends and students of the university. But we also have a main client in Rotterdam and we do not need to stay here"* (FF, member of Flying Fish, 2021). However, they do not feel the need to stay there if their rent or space conditions change dramatically since they can continue operating with clients in other areas, as it is the case with one of their main ones in Rotterdam (FF, member of Flying Fish, 2021). Their operations consist of low manual

production, relying on office-like processes, digital production and prototyping (e.g., 3D printing). Their interaction with other companies in the area is low, aside from the immediate neighbors, unless they meet in public venues (e.g., Koperen Kat). Besides, it can be noted that some of the existing users can have a "negative" perception of the large-scale companies: *"Yeah, (Prysmian) it is like an old factory"* (FF, member of Flying Fish, 2021).

Therefore, shedding light on these existing companies is important to discard assumptions about how businesses operate and avoid conflicts between the diverse users: *"It is indeed essential to organize awareness of the existing industry for people, we will have to continue to do this in all inner-city environments, not only where there is activity…"* (PM, project team member, 2021). The effort is needed to make the entrepreneurs from this Business group work as ambassadors, both for new entrepreneurs and residents. A project developer suggests entrepreneurs should feel at home in the place to feel responsible, together with the residents, and make a positive atmosphere in the neighborhood; even with environmental nuisance, it should be worked out together (HA, director of Amvest, 2021). Table 5 shows some of the actors involved in the process, their role, contact person and interests.

Table 5 - Business actors

Actor	Role	Contact	Interests
Bedrijvenkring Schieoevers (BKS)	Business Association and Lobby	Nick Eekhout	Business ecosystem support, networking and interaction
Prysmian Group	User and land owner (International cable manufacturer)	Klees Verkuil	Business operations with national and regional reach
Dyckerhoff Basal	User and land owner (International concrete producer)	N/D	Business operations with national and regional reach
Octatube	User and land owner (Construction systems manufacturer)	Nils and Mick Eekhout	Business operations with national reach
Hordijk	User and land owner (Packaging manufacturer)	N/D	Business operations with national reach
SUEZ	User (waste management)	N/D	Recycling and waste processing
Flying Fish	User (High-tech engineering)	Gijsbert van Marrewijk	Scale-up and grow based high-tech solutions
Koperen Kat	User (Brewery)	N/D	Business operations and social activities with local reach
KINK	User (Collective workshop)	N/D	Collective growth and business operations with local reach

Power and Interest

As seen before, the actor network consists of a large variety of stakeholders, making it a diverse group to manage. Nonetheless, these actors can have different power and interest over the process (see Fig.15). Just like agency and structure, stakeholders with more power can steer and shape the structure to their interests, but can also be limited by normative conditions of the structure. Besides, the actors can use their power in different arenas, according to their interests. The power, i.e., the leverage over the process and other actors, is usually linked to land ownership or financial capital. Both developers (e.g., Amvest and Kondor Wessels) and large companies (e.g., Prysmian and Basal) have this type of power. Though, leverage nowadays can also be created through social capital (i.e., collectiveness), media, product and technology. This can be seen with BKS and TU Delft having power over the process despite not owning land in the area itself, but gaining leverage through collectiveness and technology, respectively. Besides, Borra & Urhahn (2020) argue that land policy can be used as leverage when applying special conditions for manufacturing development. This type of leverage makes Gemeente Delft have enough power in the process without being a main capital actor. The power-interest matrix makes it possible to compare different actors. It is important to understand that actors with high power and interest are key players in the arena; actors with less interest are meant to be kept satisfied; actors with less power are meant to be kept informed; and actors with less power and less interest are meant to be kept with minimal effort.

This analysis allows to have more clarity of the network, thus be able to manage the actors and foresee possible *place-breakers* if not managed well: *"You have to collaborate with each other and otherwise it will not succeed"* (GB, policy consultant for BKS, 2021). In the case of Schieoevers Noord, while the actors with higher power and interest (e.g., SPC, AM, Gemeente Delft) are leading the redevelopment process, attention should be put on actors with high leverage due to land ownership which are not actively involved in the process (e.g., Prysmian Group, Dyckerhoff Basal, Hordijk), or those "ambassadors" which may gain leverage through collectiveness: "*The DNA of the Cable District has been formed since 2004. With the few resources available, many creative people have worked here on setting up a manufacturing city. The area would be demolished. I would therefore also like to see these people included in the formation of the new DNA of Schieoevers Noord"* (LC, member of Lijm & Cultuur, 2021).

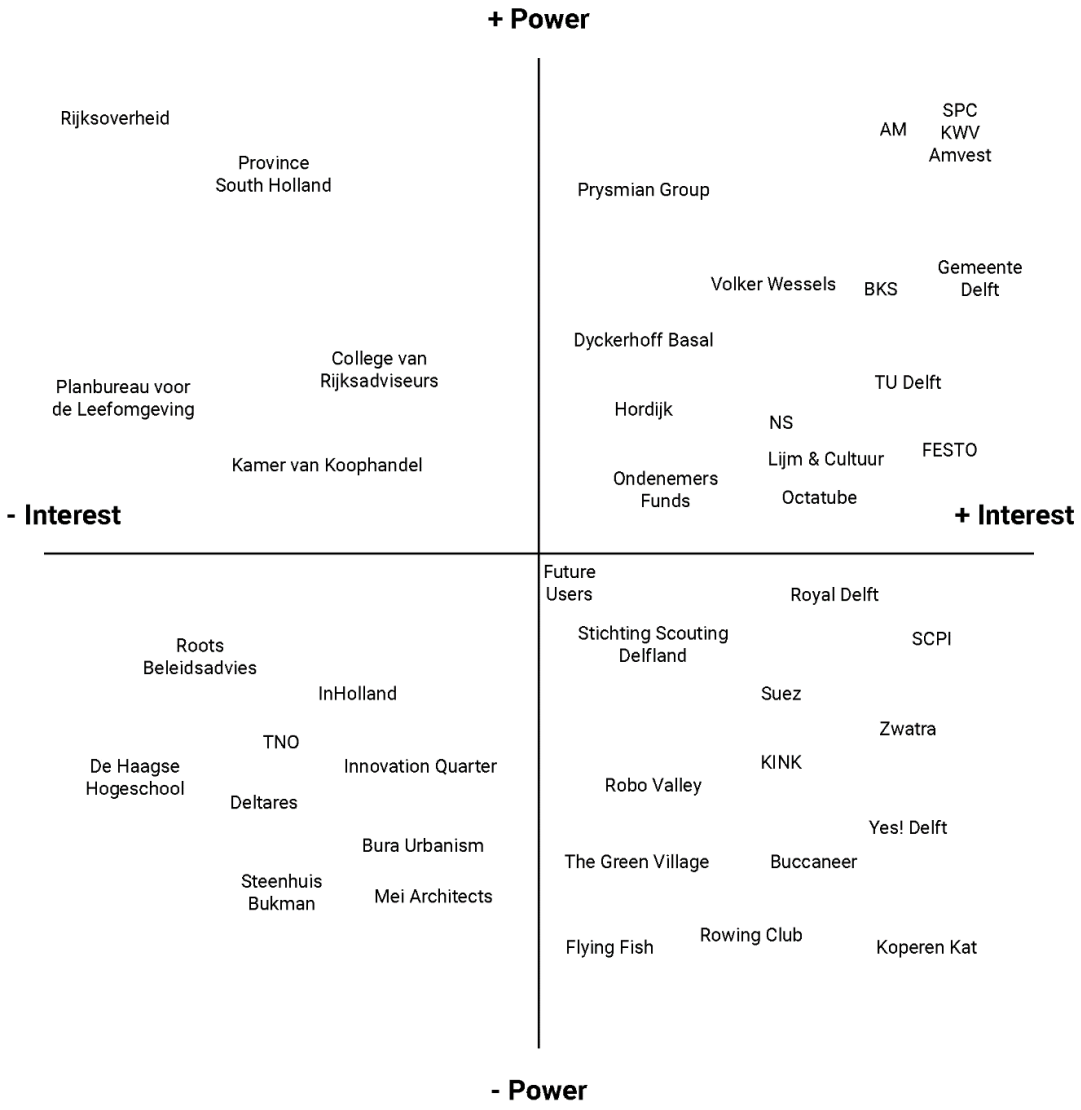

Figure 15 - Power-interest matrix (own image)

4.2. Place (Area)

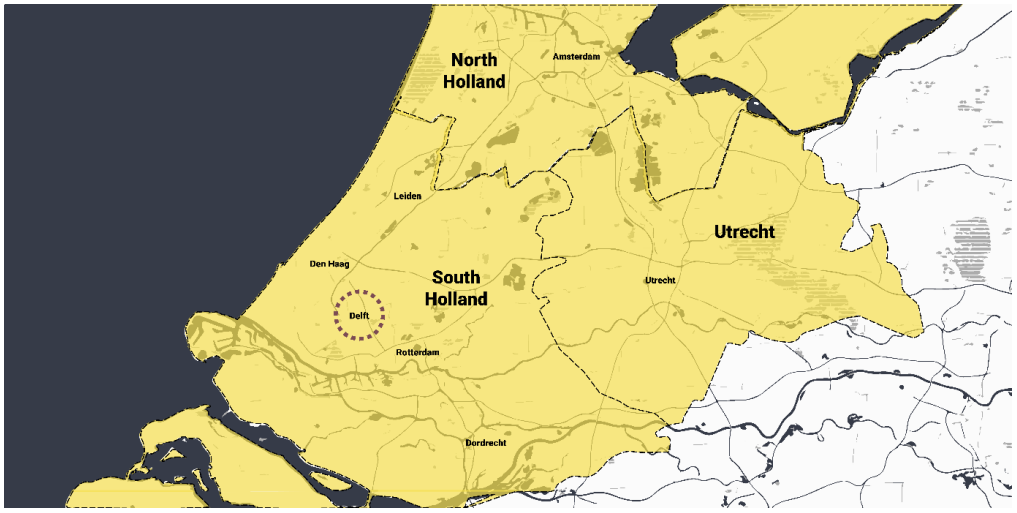

Figure 16 - Randstad - South Holland - Delft (own image)

City and Region

Delft has the ambition to leapfrog from a knowledge city to the high-tech capital of the Netherlands and plans to overcome socio-economic challenges by creating 10,000 additional jobs and 15,000 new homes by 2040 (Gemeente Delft, n.d.). According to Gemeente Delft & Kuiper Compagnons (2018), the housing supply is expected to grow 30%, and the number of jobs, 19%. As mentioned before, Delft, like many cities of the Randstad region, has limited space to overcome the population growth, household growth and an expected housing shortage. A housing expert from TU Delft referred to "*housing shortage as an increasing pressure on space*" (PB, housing expert of TU Delft, 2021). In addition, Delft's broad vision also involves the realization of more workplaces, space for innovative manufacturing, new forms of mobility, and a sustainable environment (Metropoolregio Rotterdam Den Haag, n.d.). However, the South Holland Province, including Leiden, The Hague, Delft, Rotterdam, and Dordrecht is promoting housing development to take advantage of the great connectivity due to the outer line of public transport (see Fig.16). While the city of Delft has been already planning to stimulate housing development, it has struggled given a lack of economic vision as a whole. This resulted in concerns from the community, especially the business association in Schieoevers (BKS). Thus, the policy consultant, working together with the business association, decided to "*write a letter to the city council about the lack of economic vision and there was a political discussion about it and the municipality made the decision to make an economic vision for Delft as a whole*" (GB, policy consultant for BKS, 2021).

Hence, the city has the challenge, or opportunity, of combining multiple assignments at the same time. Delft has already been establishing as a knowledge city given the presence of TU Delft, though urbanization brings an economic impulse that could improve the role of Delft within the region and country if strategies are implemented effectively. A business manager from Gemeente Delft has described the "*technical talent of Delft as the unique selling point, which is not in conflict of interest with others in the region*" (MM, business manager of Gemeente Delft, 2021). In addition, the position of the city

can be seen as a geographical and strategic link between the larger neighboring cities, The Hague and Rotterdam. The policy consultant for BKS suggests that strengthening this link would allow tackling current and future challenges as a region:

"A lot has emerged from TU Delft spin-offs who are looking for a place in the region, they are looking for one community that suits them best…I think the main factor is that it is close to TU Delft and between the two cities (The Hague and Rotterdam) …it is a threat or a big opportunity for the labor, which is one big factor for the companies which are now in the area. The unique point is its close position to TU Delft and the chance to develop in connection to the TU Campus ecosystem. You don't have that in Binckhorst and on the Makers District you have it partly because of RDM Campus…but lots of companies there have their roots in Delft" (GB, policy consultant for BKS, 2021)

Area Conditions

The area of Schieoevers is defined by underlying conditions within the spatial and socio-economic dimensions. Both history and traditions have shaped the current situation of the area, slowly transforming from an autonomous and "out of place" area, specialized on cable manufacturing and logistics, towards an area with diverse business activities adjacent to the Delft city center, TU Delft campus and residential neighborhoods.

Within the area of Schieoevers, the city is focusing first on developing the northern part, given the nature of the area and ambitions, though, the southern part still has a role. Schieoevers Zuid (South) will be oriented towards facilitating traditional industrial activity with water connection and higher environmental activity, while Schieoevers Noord (North) is the driver to develop a mixed-use area. The policy consultant argues that *"(Schieoevers Noord) has more chances for small companies from Yes! Delft, with less mobility, noise and environmental issues. In the southern part, more production and industrial area which accommodates bigger firms"* (GB, policy consultant for BKS, 2021).

Spatially, Schieoevers Noord is a 60 Ha area that was originally developed in the outskirts of the city as an industrial estate but, due to urbanization, it has been overtaken by new developments. The area manager from Gemeente Delft argues that the area was originally suitable for manufacturing, but it is not so clear nowadays with the TU Delft Campus on one side and residential neighborhoods on the other: *"Schieoevers in the first place, it was somewhere outside the city, along the water, near a big road. It was logical to be a production area…but nowadays no, with the development of TU Delft on the East side…and along the West side there are living areas…"* (DS, area manager of Gemeente Delft, 2021). Now, Schieoevers Noord has a central location within Delft, with a close connection to the city center, TU Delft, residential neighborhoods, and the two train stations (see Fig. 17). According to Gemeente Delft & Broekman (2019), Schieoevers Noord is a focal point for connecting the historic city center in the North and the peripheral area in the South by developing spaces as the "green-blue" lung of the city. Besides, the area has the opportunity to break the barriers (e.g., waterway and railway) between the residential neighborhoods of the West and the TU Delft Campus in the East. Regarding its built landscape, the area consists of a variety of industrial real estate, including large warehouses, cranes, fences, open space for stock and silos, among others (see Fig.18). In addition, some historic buildings can still be seen, mainly being used by cultural organizations and companies. Other elements, like large office and educational buildings can also be seen in the surroundings, mainly used by TU Delft and multinational companies.

The strategic location of Schieoevers Noord motivates the connections to aspire for an innovative work-live area, making it more than just a simple project, but an important part of the whole city. In other words, Schieoevers Noord is its own ecosystem within a whole network and it that can develop further by breaking physical barriers and strengthening the connections with the rest of the network. The ecosystem benefits from making and producing the inventions and ideas developed on the knowledge ecosystem on the other side of the Schie canal, the TU Delft Campus: *"There are a lot of mini ecosystems…on one side of the Schie we have inventions and ideas, and we make it on the other side…how representative the location is…there are a lot of companies who have relocation questions and would perfectly fit"* (MM, business manager of Gemeente Delft, 2021).

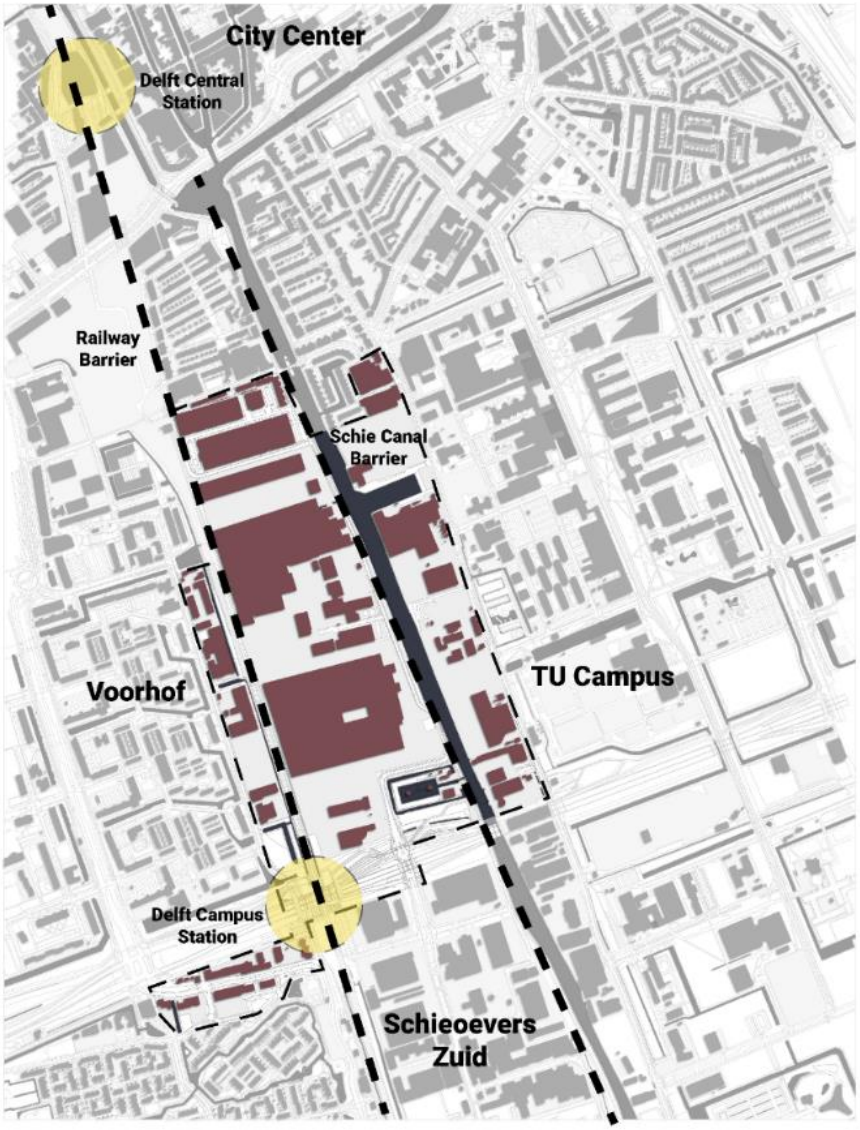

Figure 17 - Schieoevers Noord (own image)



Figure 18 - Schieoevers Noord (own image)

Furthermore, Schieoevers is geographically located as a link between the Binckhorst, The Hague and the Makers District, Rotterdam; both important industrial urban areas in process of transformation too (see Fig. 19). As the main industrial area of Delft, Schieoevers has a different socio-economic profile compared to the rest of the city. According to Roots Beleidsadvies (2017), by 2016, Schieoevers accounted for approximately 4,900 jobs (40% in manufacturing) and producing more than 6.6 million euros of added value (64% in manufacturing), resulting in more than 9% of employment and 17% of added value of the city. The whole Schieoevers, by 2016, also had a space productivity (i.e., added value per Ha) higher than the rest of Delft and higher than the average industrial areas in the region (Roots Beleidsadvies, 2017). These are some of the reasons Schieoevers Noord is considered a main driver to achieve the ambition of becoming the high-tech capital of the Netherlands due to the presence of TU Delft. Nonetheless, the approach for redevelopment has not always been the same. The policy consultant of BKS emphasizes that *"it's a big difference because in that period from 2017, there were only plans to stimulate housing and not an economic program"* (GB, policy consultant for BKS, 2021). The biggest difference relies on having a strong economic vision and a role in the ecosystem of manufacturing innovation. Now, the area can have an important role in the network of ecosystems and aligns with the plans of the municipality and the region. However, there is need for space to foster manufacturing activities, as it can be seen with most startups and successful companies from incubators decide to move to Rotterdam and The Hague looking for space to develop: *"70% of the growers are not growing in Delft…they made the decision to go to Rotterdam or The Hague because there is space to develop themselves"* (GB, policy consultant for BKS, 2021). Although there is already work being done in the area, it is still too little in comparison to the available space that could be developed. The housing expert from TU Delft suggests that despite the existing jobs in service and production, *"there are parts of the industrial estate that are not yet being used optimally"* (PB, housing expert of TU Delft, 2021). Fig. 20 shows the type of work present in the area, involving the industries of manufacturing, retail, service, storage, design and culture.

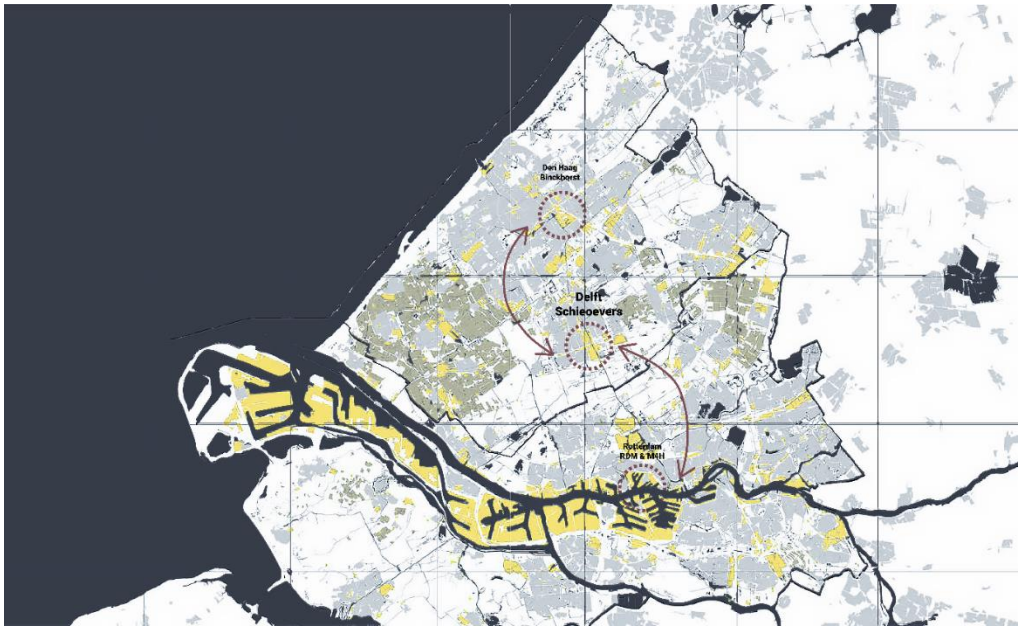

Figure 19 - Industrial areas of Den Haag, Delft and Rotterdam (own image based on Cities of Making, 2020)

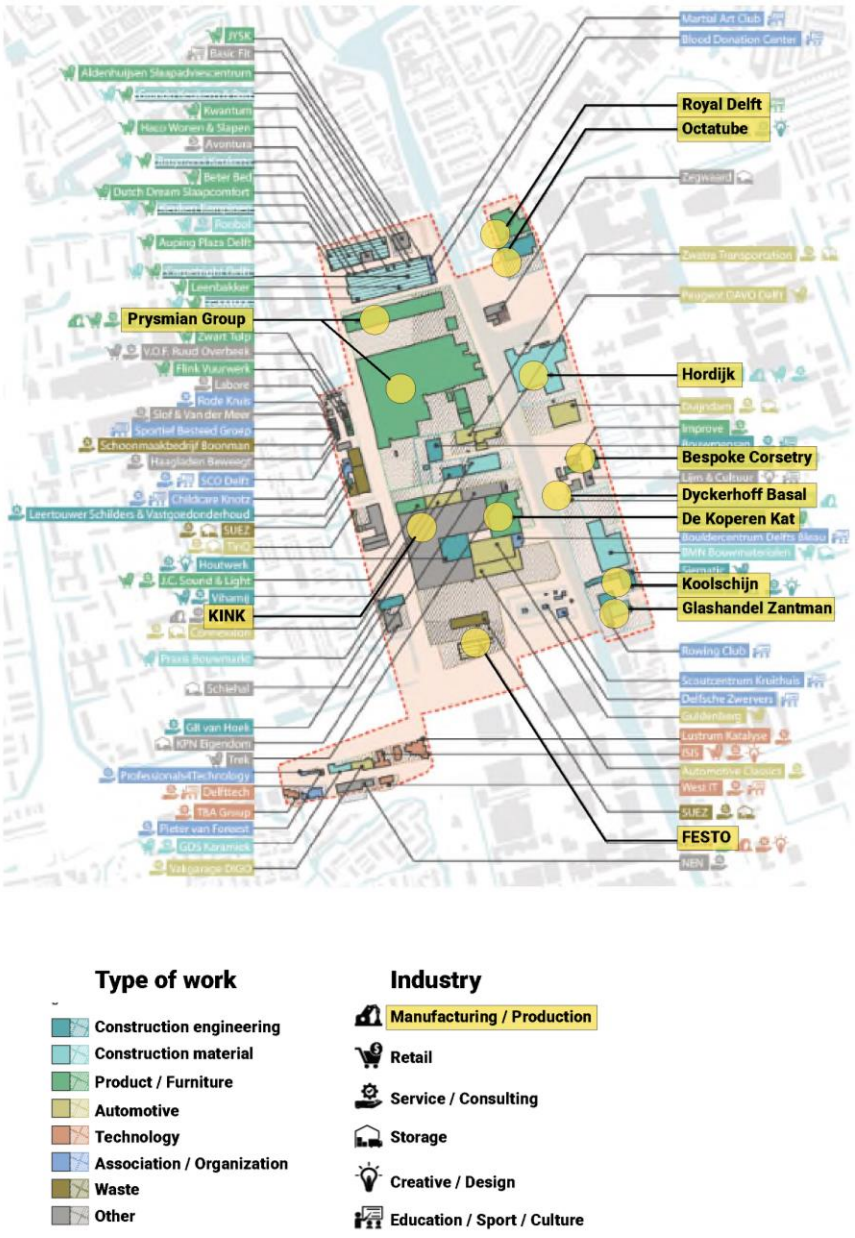

Figure 20 - Map of functions in Schieoevers Noord from Antea Group (2019)

The urge for space and the ambitions of the stakeholders are steering the area to become an integrated living and work environment but the history has shown that it is relatively common to separate living and working. As it was explained by a city planner of Gemeente Rotterdam: *"in the Netherlands we are not only doing these things (living and working) spatially divorced, but also financially…we see a lot of benefit from the overlap…a*

(living) environment with economic interaction is very important" (WV, city planner of Gemeente Rotterdam, 2021). Nevertheless, developers in the area claim that despite the tradition and advantages of separating living and working, they pursue a mixed-use environment. For instance, a development manager involved in Schieoevers Noord states: *"we are very good at separating living and working. We can keep the distance between these things separate, but the dream for the Cable District is that we can combine this while we can maintain the atmosphere"* (OW, development manager of Amvest, 2021). A design consultant argues that the atmosphere is not seen from a top view but it is seen in the meeting places, the residents, entrepreneurs and the community formed: *"…the atmosphere in a city and the meeting places present are more important. In Delft, the existing residents / entrepreneurs form the community and they should be taken as a starting point for further development. People's behavior must be more central."* (AB, design consultant, 2021). In addition, in a survey during the participation meetings (~55 respondents, including users), 95% agreed that mixing living and working would add value to the area and businesses; 85% agreed the redevelopment would contribute to the liveliness of Delft; and 75% agreed densification is necessary to meet demands of housing (MP, meeting participants, 2021). On the other hand, 54% disagreed that shared mobility would be enhanced in living-working environment (MP, meeting participants, 2021).

Moreover, Daamen & Verheul (2018) emphasize the challenge of the integrality of the assignment in Schieoevers Noord; considering both the living issues and the economic growth of the region. This challenge is highlighted by comments of some stakeholders during the participation meetings that are concerned about resolving the bottlenecks only at a micro level, instead of showing the connections of local problems to the larger picture (MP, meeting participants, 2021). In addition, mixing living and working (e.g., manufacturing) involve environmental challenges that hinder the implementation of spatial strategies. For example, housing cannot be developed close to a property with high environmental category, in particular some manufacturing companies, unless they change the operations to cleaner processes and lower environmental categories. One of the development managers stress that *"they (Prysmian and Basal) have too high (environmental) category, so we cannot develop housing while they are doing these activities"* (HL, development manager of Kondor Wessels, 2021). As mentioned before, those companies are expected to be allocated in the southern part of Schieoevers. Though, a development manager argues that these "big factory style" companies cannot even settle in Delft or Rotterdam anymore; instead, manufacturing companies into prototyping are interesting businesses to combine with houses because they are becoming cleaner: *"Not like in a factory style, because once it gets really big factory line work, you can't do that in Delft anymore, you can't even do it in Rotterdam, you need to find other areas…but, for prototyping business…really interesting business to combine with houses…they need space to do their business and it is becoming cleaner and cleaner"* (OW, development manager of Amvest, 2021).

Just like The Hague and Rotterdam, Delft is looking for opportunities in industrial urban areas to overcome these challenges and achieve their ambitions, while taking into consideration that, in essence, *"these areas have large number of companies, these areas are made for companies"* (GB, policy consultant for BKS, 2021). To do so, Gemeente Delft is approaching the development through an organic area development instead of an integral approach. Gemeente Delft & Broekman (2019) define organic area development as an approach in which the area starts with proposals of various parties from the area and not by a strong guiding municipality. Having an organic area development means that the transformation of Schieoevers Noord depends strongly on the interests and actions of the actors involved, including the existing manufacturing companies, and not only on the ambition of municipality. In addition, Gemeente Delft is not buying land

themselves due to lack of financial capital, but relying on cooperation with the stakeholders that own the land in the area: *"With 6-7 owners, you got 80%-90% of the area on control, and today there are five very large parcels which are owned by one body; that's very fundamental"* (DS, area manager of Gemeente Delft, 2021). Gemeente Delft & Broekman (2019) explain in the development plan that it has been divided into 15 sub-areas according to the location, ownership and type of activities. Therefore, the initiation of the development has been done in the plots owned by interested parties at the moment: Schiehallen (i.e., Cabe District) and Nieuw Haven (i.e., Schiekwartier).

4.3. Product (Outcome)

The product of the area redevelopment consists of the physical and nonphysical outcome, considering scales from the region to the building itself. From transcalar (i.e., across all of the scales) to the program, the outcome is described according to documentation, interviews and meetings, though some of these descriptions are visualizations of a possible future. Nonetheless, this expected outcome is essential to understand the interests of the actors and establish a basis to assess with the scenarios presented further in the report.

Transcalar / Region

The current redevelopment of Schieoevers Noord has five starting points to create a lively, mixed urban area with special space for the knowledge-intensive and innovative manufacturing industry (Gemeente Delft, n.d.): a lively mixed urban area; socially and culturally diverse; innovative manufacturing industry; good connections and new mobility; healthy and sustainable environment. To do so, the current industrial area is expected to be transformed into an attractive urban area by adding more houses and creating more jobs. According to the area manager, Gemeente Delft intends to develop the industrial urban area into a *"unique, mixed, urban area, future proof and multifunctional"* (DS, area manager of Gemeente Delft, 2021).

As mentioned before, participants are concerned of how micro-scale bottlenecks are linked to the macro perspective. Therefore, the built environment and activities developed in the area take into account what has already been made in other cities to compare and contrast: "*Biggest difference between Strijp-T and Schieoevers Noord is that in Strijp-T it is about horizontal mixing and in Schieoevers Noord it is about vertical mixing"* (GB, policy consultant for BKS, 2021). Setting the future outcome in comparison with other cities facilitates learning from other processes and avoiding conflicts of interest within the region. For example, according to a city planner from Rotterdam, the desired outcome for Schieoevers Noord differs from similar areas in Rotterdam and Eindhoven: *"Delft is seen as an area with space for pioneers and start-ups. Compared to Eindhoven, there are more makers with actual materials. Rotterdam focuses more on energy and maritime"* (WV, city planner of Gemeente Rotterdam, 2021). Therefore, it supports the intention of creating spaces and activities for a specific sector in the industry (e.g., high-tech manufacturing) to improve the competitive advantage.

City / Neighborhood

Based on comments from a policy-maker, Schieoevers Noord is a means to achieve a broader objective of the whole city: "*'What kind of city do we want to be?'. Politics is also very involved in this. We try to strive for a more mixed environment in Delft."* (SB, policy-maker of Gemeente Delft, 2021). Nevertheless, this socio-economic ambition of the city has implications on how to distribute the physical and nonphysical elements within the specific area of Schieoevers Noord. For example, the ambition of Gemeente Delft is to realize ~15,000 new houses and ~10,000 new jobs in the city by 2040, which has been agreed already with the whole region (DS, area manager of Gemeente Delft, 2021). Out of these numbers, the area is expected to allocate ~4,000 houses and ~1,800 jobs by 2030; and ~7,500 houses and ~5,500 jobs by 2040 (Gemeente Delft & Broekman, 2019a). This new product in the city is expected to be spatially integrated in order to achieve the ambition of a mixed environment: *"connectivity with station Delft Campus…also a tunnel to connect TU Campus with Voorhof, Buitenhof and Tatenhof"* (GB, policy consultant for BKS, 2021). This mentioned connectivity to the rest of the city relies on the future bicycle and pedestrian Gelatine bridge that connects the area to the TU Delft Campus and a tunnel under the railway to connect the Delft Campus station to the residential neighborhoods. Both of these interventions are expected to be done by 2024, enhancing the urban integration (PM, project team member, 2021). Design consultants discuss during the participation meetings how the bridge can be a driver for create a place and reinforce aspects of the location; how public space can articulate the area to the surrounding environment (e.g., city center and TU Delft); or even the importance of taking elements used in the city as reference to create more connections, for example the sidewalk typology: "Delftse stoep".

"In its design, the bridge can bring something new to the context, but also create the place and reinforce the new aspects of the location." (PR, architect of SK Movares, 2021)

"Schiekwartier is closer to the city, surrounded by activity and next to TU Delft…public space must anchor the area to the environment and for approx. 300 homes" (DP, urban designer of De Urbanisten, 2021)

Neighborhood / Block

Looking closer to the neighborhood itself, the whole area is treated as a city within the city. The intention is to have mixed and diverse environments to make an attractive area: *"Combination of buildings and diversity in the type of environments within Schieoevers makes it a fascinating area"* (FZ, urban designer of BURA, 2021). The desired outcome from the developers, policy-makers and designers is to create a mix of low and high-rise buildings while keeping and improving parts of the industrial heritage: *"It will be a mix between low and high-rise buildings. The added complexity in the area is that there is an old factory. The features and certain parts are kept as they are."* (JV, development manager of Kondor Wessels, 2021). Having an area approach creates advantages to reorganize infrastructure or public space according to the needs and interests: *"If you only look at the plots one by one, we would have never been able to flip the road to the other side"* (DS, area manager of Gemeente Delft, 2021). Public space is seen as essential to integrate buildings and activities throughout the whole area. An independent developer suggests that, in projects with high density as this one, public space deserves close attention and management, double use of space is essential, and elements of the industrial heritage should be conserved. (MR, independent developer, 2021). Therefore, the future outcome is highly dependent on how public space is used throughout the area to

integrate living conditions within an existing economic environment (i.e., industrial area): *"the connection of buildings to public space is enormously important. It is important that the public space becomes lively and the plinth (ground floor) offers space for meeting and interaction."* (FZ, urban designer of BURA, 2021). In addition, the architect of the Cable District suggests the importance of various meeting places for residents throughout the neighborhood, including shared inner gardens and roof terraces (ML, architect of Mei, 2021). The importance of the public space throughout the area is indeed mentioned constantly throughout documents, meetings and interviews. The approach on the area as a whole allows to plan different meeting places according to the needs of the users. Furthermore, it facilitates the shift of circulation to implement a mobility system without conflicts. Nevertheless, these decisions rely on having the land owners on board to be able to make compensations.

Block / Building

Despite having an expected outcome for the whole area, the redevelopment consists of an organic approach. In other words, the product will be developed gradually plot by plot. This allows public and private parties to focus on smaller scales and define blocks in different phases. According to Gemeente Delft & Broekman (2019a), the plan to develop the Cable District and Schiekwartier by 2030 creates a clearer and defined output. On the other hand, the other blocks and buildings are less defined, but should take form after 2030. Nevertheless, a Spatial Quality Framework document is expected to be used as guide and assessment tool to steer the future outcome of the buildings, blocks and the public space (DS, area manager of Gemeente Delft, 2021). As mentioned in the Development Plan, the Spatial Quality Framework is used as a guideline to ensure a good result is achieved, prevent nuisance and set smart design principles to facilitate the combination of living and working during design and construction (Gemeente Delft & Broekman, 2019a).

The Cable District (i.e., Kabeldistrict) consists of 12 Ha in which it is expected to allocate more than 34,000 m2 for companies and more than 3,200 houses; ideally, the KD Lab and the KD Campus would be opened by 2021 (JV, development manager of Kondor Wessels, 2021). This block is described as a new city district where people live, work and create. The architect of the project describes the future block as a dialogue between the old factory and the new buildings around it (ML, architect of Mei, 2021). Nonetheless, this is already an existing building with existing tenants and activities taking place, for example in Koperen Kat or the Boulderhal: *"We are going to make the Kabelfabriek part of a new city district, where people live, work and create. That has already been set in motion with programs that are already taking place. Such as the Koperen Kat and the Boulderhal"* (ML, architect of Mei, 2021). Regarding the Schiekwartier, it is expected to allocate space for 300 houses, catering and workspace, and the expansion of Octatube (DP, urban designer of De Urbanisten, 2021)

Given the organic approach, it is still hard to describe the future outcome of the other blocks or buildings of the area, especially if some of them are owned by companies not on board of the development process, in particular Prysmian Group, Hordijk and Dyckerhoff Basal. However, the public space adopts a key role in integrating the existing buildings with the new product. Participants during the meetings mention that they do not need to see a finished design for everything, but they could agree on starting points, discuss along and research how to work on public spaces and road networks: *"We participated in this last year, you don't have to come up with a finished design from us, we like to think along about this. If we agree on the starting points, it will also be easier to make the*

elaborations. For example, share the road safety research with us, so that we also have more insight into it." (MP, participant, 2021). In addition, other places could be developed later in the process, for example an industrial city park on the Schie canal as a special meeting place (FZ, urban designer of BURA, 2021).

Program

Diversity of activities plays a key role in the desired outcome for the area. Introducing housing to the area entails the creation of a variety of services and facilities for new residents or visitors. For example, education and workplaces are being considered to have area-transcending functions (FZ, urban designer of BURA, 2021). In other words, new uses are expected to attract people from outside the area and have an impact beyond the location itself. Moreover, the creation of the product at this scale is faster and easier to test: *"we are going to open a mobility hub on the Cable District in the short term to look at the effect. In this way, local demand can best be mapped out."* (MB, mobility consultant of Hely, 2021)

Nonetheless, diversity is aimed to an extent, since new facilities are intended to foster an environment focused on high-tech: *"…there will also be other educational facilities, MBO and VMBO, mainly focused on technology."* (SB, policy-maker of Gemeente Delft 2021). For this reason, the program would be steered to a desired outcome based on the type of businesses developers are aiming to attract: *"It is a relocation of the storage and low-value businesses that are leaving the area. Knowledge-intensive companies are entering the area and we are trying to attract them."* (JV, development manager of Kondor Wessels, 2021). This future outcome can create a movement or encounter a barrier depending on how it is developed, visualized and communicated: *"…I think they (Prysmian Group) will adapt to the direction we designed with the development plan and that's going to be a mixed area. We're not forcing them to do it here, we're just facilitating and inviting them to do it because we would like them to think about a different future than being just a simple cable factory"* (DS, area manager of Gemeente Delft, 2021). However, assuming that every activity would be aligned to the vision is unlikely, thus it is important to make new residents aware of existing activities associated with environmental nuisance. The city planner of Rotterdam suggests that sharing and exchanging resources (e.g., energy and parking space) can generate value from overlapping living and working uses: *"An environment with economic interaction is therefore very important; you have to be smart with your resources."* (WV, city planner of Gemeente Rotterdam, 2021).

Furthermore, one urban designer argues that good meeting places are necessary but also building a network of users to grow community: *"You want to build a community that grows. You can speed this up by building a network. A good example of 'making city together' is the facade garden"* (HK, urban designer of Stipo, 2021). The area manager supports the idea by mentioning that it is not only the physical elements, but also the social dimension. For this reason, they consider the program more of a process rather than a project, since it involves a goal but not a specific way to get there:

"…it is more than a project which is very well specified…bit softer…a program is more like a process; we got the goal but we don't know really how we're going to get there. It's not only the physical part, it's also the social part." (DS, area manager of Gemeente Delft, 2021).

4.4. Process (Strategies)

Past (2006-2020)

The redevelopment of Schieoevers Noord has been a long process with various initiatives from public and private parties, though some challenges have stalled the process at given moments. In 2006, the City Council adopted the *Schieoevers Area Vision* due to the purchase of land from private developers, but by 2010 this had to be updated to take into account the objective of transforming the Northern part into a mixed-urban environment (Roots Beleidsadvies, 2017). This plan in 2010 already included the redevelopment of the former Delft Zuid station, the tunnel under the railway and the construction of a bridge over the Schie canal. The area manager refers to this plan as a base with rough ideas for the current vision but argues that it was not well defined and properly decided (DS, area manager of Gemeente Delft, 2021). In fact, the policy document of *Economic Vision Schieoevers 2030* mentions the lack of public participation in this plan and the limited implementation of it on the current zoning plans (Roots Beleidsadvies, 2017). However, strategies had to be postponed or discarded due to the economic crisis and an unclear spatial framework, revealing the lack of resilience and awareness of what is possible in the area (Roots Beleidsadvies, 2017): *"Other developers have been working on Schieoevers, but they all went bankrupt because of the financial crisis so these old plans had been there"* (DS, area manager of Gemeente Delft, 2021). Therefore, this has resulted in an unrest from the users and companies of the area as shown by a participant's comment during a meeting: *"We have already spoken to the municipality several times, this process already started in 2010. Each time, a new architect comes along who again encounters the same problems. Perhaps we should go back to basics in order to arrive at a good plan together. We are still open to this."* (MP, meeting participants, 2021).

In 2017, market interest on the area rises again, especially in locations of the Schiehallen (i.e., Cable District) and the Nieuwe Haven (i.e., Schiekwartier); thus, Gemeente Delft presented plans for the area but mainly regarding a housing program and not taking into account a strong economic vision (GB, policy consultant for BKS, 2021). This resulted in a response from users and businesses, supported by the BKS, in which they considered the involvement of the companies was limited and there was a lack of economic vision for Delft as a whole (Roots Beleidsadvies, 2017; GB, policy consultant for BKS, 2021). The area manager argues that they have been collaborating with the users since the beginning but the policy advisor of the BKS mentions the importance of a letter to the City Council and the *Economic Vision Schieoevers 2030* as starting points to discuss together about the development and include a strong economic program (DS, area manager of Gemeente Delft, 2021; GB, policy consultant for BKS, 2021). According to the chairman of the BKS and user of the area, *"this (economic) vision focuses on two points, namely being the greatest added value for the Delft economy and nurturing / stimulating the existing companies."* (NE, chairman of BKS, 2021). This event generated political debates, though it opened the way for discussion until goals were combined in an agreement between BKS and Gemeente Delft in 2018 (GB, policy consultant for BKS, 2021).

Notwithstanding, the area manager argues that the redevelopment process takes a real impulse in 2020. This happens after the former owner of the Schiehallen applies for a permit to make a large distribution center, but, although it is possible within the zoning plan, the intention did not fit well in the plans of Gemeente Delft, making them react within 12 weeks: *"he (former owner Schiehallen) pushed us to decide"* (DS, area manager of Gemeente Delft, 2021). Meanwhile, the former owner opens the opportunity of discussion through a letter to the City Council, so it was possible to find parties

interested in buying out and developing a project aligned with the vision (DS, area manager of Gemeente Delft, 2021). The area manager mentions that they are currently working with those owners who have made an agreement about what they are going to make and how can they contribute for the cost recovery of public investment (e.g., infrastructure and public space). This is one of the reasons the area development strategy is being considered an organic approach. In the case Gemeente Delft owned the land, it could have been possible to make a complete zoning plan for the 60 Ha, but this is not the case and they have to negotiate with developers to have a feasible plan: "*if we would have been the owner, we could have made one zoning plan for the whole 60 Ha because we would have had control of ownership, but we didn't have it, so we are only making zoning plans with those owners who made an agreement about what they are going to make and what they are going to pay us as contribution to our costs"* (DS, area manager of Gemeente Delft, 2021; HL, development manager of Kondor Wessels, 2021). One of the challenges presented when planning to develop manufacturing in the area is prices would be too high for the existing companies, so Gemeente Delft decided to invest 5 million euros to create affordable space for these companies: *"So one of the big threats for the goal to develop manufacturing in this area is that the prices are too high for the companies which are active in it. And a big step inthe summer of 2020 was that the municipality said they want t invest 5 million euros to create payable spaces for companies. You see that in a lot of transformation areas that is a main factor why ambitions are not accomplished"* (GB, policy consultant for BKS, 2021). This means a lot for the vision since it is one of the main factors why ambitions are not easily accomplished in these areas.

Present (2021)

Currently, the redevelopment process undergoes three phases: it started with the Development Plan, then the preparation of the Spatial Quality Framework, and last the elaboration of a Zoning Plan. To do so, Gemeente Delft started a process in collaboration with developers, and presence of policy-makers, housing experts, urban designers, architects, mobility consultants, residents and business owners (PM, project team member, 2021). The participation process started at the beginning of 2021 with meetings on work, quality of life, accessibility and living. According to the area manager and two developer managers, the process enables some degree of flexibility, though a defined goal is needed to provide clarity to the interested parties and users (DS, area manager of Gemeente Delft, 2021; OW, development manager of Amvest, 2021).

"…on the one hand you need to provide clarity to residents and entrepreneurs, and on the other you need flexibility in the design and development plan. You cannot see in a crystal ball what changes will come in the future. And that balance seems very difficult to maintain." (HA, development manager of Amvest, 2021)

Some conflicts have been encountered during the meetings. For example, there has been concern about exising users not being taken into account before: *"I have not heard anything new compared to 9 months ago. I see that the municipality has not yet done anything with our comments"* (MP, meeting participants, 2021). Others argue that their ideas of meeting places to foster activities have been copied instead of working together: *"This is plagiarism. I've been working on these themes for 10 years, just across the street"* (LC, member of Lijm & Cultuur, 2021). However, some participants mention that there has been positive progress on how to approach place-making in the area, but it should not be forgotten on how to link identity to the physical environment: *"identity is strongly linked to physical aspects…I still miss an in-depth study of the sociocultural identity…I think the place-making of Schieoevers Noord is very good. Compared to old ideas, I think it is an enormous*

progress." (SD, member of Scouting Delfland 2021). One of the urban designers state: *"…it is important to develop this further with the neighborhood. That is why we want to start communicating with people as soon as possible. Someone special has also been recruited for place-making…"* (KK, urban designer of ZUS, 2021). Nonetheless, based on the presentations, place-making is being presented as the strategy of creating specific events and spatial interventions to attract people: "*Place-making is about seduction. The area is now often seen as an industrial and barren area. Place-making must ensure that it becomes lively, so that people like to move there."* (NV, manager of Cable District, 2021).

Besides, there have been issues related to Covid-19. A development manager has been critic with how the process has affected the way actors are able to get involved (HL, development manager of Kondor Wessels, 2021). The business manager argues that making direct contact with the businesses helps to diminish the impact of Covid-19: *"the implications of Covid 19…I think for the participation, it's tragic"* (MM, business manager of Gemeente Delft, 2021). Although, policy maker agrees but acknowledges the opportunity to attract other people and parties since the online meetings can have more reach (GB, policy consultant for BKS, 2021). However, complaints were made regarding the weak participation of TU Delft during the meetings: "*I find the link with TU Delft disappointing so far. I don't see a lot of people from TU Delft here, from which I interpret that there is little interest from TU Delft, which I find very shocking"* (RD, development manager of Fakton, 2021). Arguments were made to explain that there is in progress an alliance agreement and ambition in the train station with TU Delft, but this raises concerns (DS, area manager of Gemeente Delft, 2021). Equally, the business manager realizes that there has been any participation from international students, partly because the communication has been completely in Dutch: *"yeah, we have to communicate more in English…every year there are more international students…I don't think there is any kind of participation from international students to the development"* (MM, business manager of Gemeente Delft, 2021). Also, a development manager recognizes that some meetings have been characterized by being unilateral in informing and consulting rather than having a higher degree of participation (HL, development manager of Kondor Wessels, 2021).

Furthermore, the process contemplates how market operates, establishing a defined vision until 2030 for three specific areas because the natural process would not even allow to build, sell and rent all of the new properties in the given time (DS, area manager of Gemeente Delft, 2021). The area manager argues that not having everyone on board yet (e.g., Prysmian Group) allows them to focus on specific projects at the moment. The BKS ensures that every company can still participate for itself in the process and has the respective information. One development manager mentions that Prysmian Group is aware of the development and that they need to change operations or relocate in the upcoming years, so they area already analyzing options: *"they (Prysmian Group) are aware of this development and know that they have to change or to relocate in the coming years; but it's hard for them to relocate because they are already there for a long time…but they can relocate and get a large fee so they are now negotiating to get the highest possible"* (HL, development manager of Kondor Wessels, 2021). Another development manager affirms that they are open to have some flexibility and that they have been already in discussions with Prysmian Group to avoid hindering each other's growth in the area: "*We've been able to talk to each other (Prysmian and Cable District) openly about wanting to stay here and don't wanting to have cut the perspectives to grow…we don't say everything is possible and in the end is not my decision whether they stay or not, that's also the government's decision and their own…we are open to have a look at the development plan and maybe make some small adjustments"* (OW, development manager of Amvest, 2021).

Most of the developers advocate for a natural process in which communication with existing companies is key to build good relationships (OW, development manager of Amvest, 2021; HA, 2021). In other words, they try to find ways of working together instead of creating unintended pressure over some companies: *"It is not the intention to slowly suppress work; the intention is to structurally combine working with living"* (MR, independent developer, 2021). Nonetheless, Covid-19 has shown that companies area struggling to survive and thinking on short term, while the housing market is less affected: *"COVID-19 has big effects on some type of companies so they are now more in the struggle to survive. And they are thinking more short of the long term….Covid-19 has less effect on the housing market in NL"* (GB, policy consultant for BKS, 2021). This situation is being considered to prevent hard impacts on the intended vision: *"I want to provide long lines that do not change, but that at the same time you need space to respond to current events"* (KS, 2021).

4.5. Empirical Findings

The analysis made over the case of Schieoevers Noord portrays different empirical findings regarding the actors' interests, perceptions and their interaction with other actors. Hence, the findings are described through the three actor arenas of the theoretical framework: Urban Area Development, Mixed-use Area and Urban Manufacturing.

Urban Area Development

Public service actors, namely Gemeente Delft, have different interests based on political influence (e.g., policy-makers) and their assignation to specific tasks (e.g., area manager). For instance, the area manager develops good relationships with the land owners and businesses of the specific area to cooperate and trust each other. Knowledge actors, specifically TU Delft, influence in the attraction of knowledge-intensive businesses and technology hubs, while Innovation Quarter operate by introducing related companies to the region and research how to embed them in the area.

Furthermore, few strong community actors exist in the area, but some cultural organizations (e.g., Lijm & Cultuur) are considered a starting point. Still, users acknowledge the need to develop a community hub with future residents. On the other hand, capital actors, i.e., land owners, developers and investors, namely Amvest, Kondor Wessels and AM, are important for the Gemeente Delft to have a good relationship with. They research on environmental issues and form joint ventures to develop with a long-term vision. Last, business actors are represented by a business association (BKS) which has an active role to support and situmlate the economic vision in the development. Also, existing businesses are seen as ambassadors to make connections with others interested in relocating in the area.

Local authorities own the public space and infrastructure, but not the land for development. Though, Gemeente Delft perceives the area as no longer a suitable place for only production, due to the development of TU Delft Campus and the living areas around. This proximity of to the TU Delft Campus ecosystem and the access to technical talent from TU Delft and neighbor cities (The Hague and Rotterdam) is considered as a unique point of selling by knowledge actors. Besides, the transport connectivity of the area is an advantage to develop housing and build a community for new residents, increasing the household stock 30% by 2040.

Moreover, the area is divided in large plots and most of them, approximately 90% of the land, is owned by few private parties (6-7 owners). This is considered fundamental in the decision to take an organic development approach. Business actors consider this area suitable for companies, therefore the BKS made Gemeente Delft to consider the economic vision of the area within the development plan.

Gemeente Delft and other public authorities see the outcome of the area as a future proof and mixed living environment with an economic interaction. Taking an area approach facilitates public authorities to reorganize public space and transport infrastructure. Besides, architects and urban designers propose a mix of physical elements connected through public space, meeting places, a bridge and a tunnel. Nonetheless, the community is not expecting a finished outcome, but starting points to work along and co-create.

To initiate the redevelopment, the first development interventions, namely Cable District and Schiekwartier, are started in two large plots as drivers to create a new city district with housing and more workspace. Within these areas, some businesses, for instance Octatube, are expected to expand their footprint and operations.

Local authorities have already tried these redevelopment plans several times before but have failed due to the economic crisis. This happens because they rely on having agreements with land owners and private parties to negotiate cost contributions. On the other hand, consultants argue there has been a lack of participation, limited implementation and absence of an economic vision. Besides, community members consider the process has been tried several times and the problems are still there, thus they propose working together.

Finally, the redevelopment process has been triggered due to a former land owner and their decision to develop a distribution center, making the local authorities to reach because it does not fit within the vision. Therefore, they sold the property to developers and investors that would align their ideas to the city vision. In addition, business actors were able to make agreements with Gemeente Delft to ask for public investment (5 million euros) in making affordable space for working.

Key Findings:

- Good relationship and negotiation between local authorities and land owners
- Public ownership of public space and infrastructure used as leverage over reorganization of area
- Knowledge-intensive ecosystem generates attraction of interest in the area
- Public space, meeting places and public participation are perceived as key factors by consultants
- Community actors are interested in co-creation and connectivity to living areas
- Land ownership is seen as fundamental to trigger development decisions
- Businesses require public support and stimulation to develop
- Existing business network and actors are used as ambassadors and references

Table 6 - Findings Overview Urban Area Development

Arena	Stakeholder Sector	Elements of Analysis			
		Actors	**Area**	**Outcome**	**Strategies**
Urban Area Development	**Public Service**	Gemeente Delft have different interests based on political influence (policy-makers) or their assignation to specific tasks (e.g., area manager). The area manager develops good relationships with the land owners and businesses to cooperate and trust each other.	The local authorities own public space and infrastructure but not land for development. Gemeente Delft perceives the area as no longer a suitable place for only production due to the development of TU Delft Campus and living areas around.	The local authorities see the outcome as a future proof and mixed living environment with economic interaction. The area approach facilitates reorganization of public space and transport infrastructure.	The local authorities have already tried the redevelopment plans several times but failed due to the economic crisis. They rely on having agreements with land owners and negotiating cost contributions.
	Knowledge	The presence TU Delft influences in the attraction of knowledge-intensive businesses and technology hubs; Innovation Quarter analyzes how to fit companies in the region.	The unique point of selling of the area is its proximity to the TU Delft Campus ecosystem and the access to technical talent from TU Delft and neighbor cities (The Hague and Rotterdam)	Architects and urban designers propose a mix of physical elements connected through public space, meeting places, a bridge and a tunnel	Consultants argue there has been a lack of participation, limited implementation and absence of an economic vision
	Community	Few strong community actors, but some cultural organizations (e.g., Lijm & Cultuur) are a starting point. Users acknowledge the need to develop a community hub with future residents.	The transport connectivity of the area is an advantage to develop housing (30% by 2040) and build a community of new residents	The community is not expecting a finished outcome, but starting points to work along and co-create	Community members consider the process has been tried several times and the same problems are still there. They propose working together.
	Capital	Land owners, developers and investors (e.g., Amvest, Kondor Wessels and AM) are important for the Gemeente Delft to have a good relationship. They research on environmental issues and form joint ventures to develop with a long-term vision.	The area is divided in large plots and most (~90%) of the land is owned by few actors (6-7 owners). This is seen as very fundamental in the organic development approach.	First development interventions (Cable District and Schiekwartier) are started in two large plots as drivers to create a new city district with housing and more workspace.	A former land owner triggered the local authorities with the decision to develop a distribution center that does not fit within the plans. They sold to interested developers and investors that would align their ideas to the city vision.
	Business	A business association (e.g., BKS) has an active role to support and stimulate the economic vision in the development. Existing businesses are seen as ambassadors to make connections with others interested in relocating in the area	The area is considered suitable for companies. The BKS made Gemeente Delft to consider the economic vision of the area within the development plan.	Some businesses (e.g., Octatube) are expected to expand footprint and operations in new development plots	Business actors were able to make agreements with Gemeente Delft to ask for public investment (5 million euros) in making affordable space for working

Mixed use Area

Public service actors at local and regional levels facilitate positive discussions between different users to make agreements about use of space. Knowledge actors consider that attracting high-tech manufacturers can facilitate the combination of work with living conditions to avoid issues. Community actors discuss that users are having a battle for space, but public space and meeting places, for instance Lijm & Cultuur, can be taken into account for co-creation and building a community together. In addition, developers, namely Amvest, Kondor Wessels and AM, are long term investors through joint ventures and alliances, making them localized actors that interact with others in space.

According to knowledge actors, population growth, household growth and housing shortage is creating an increasing pressure on space. Therefore, local authorities see benefit from overlapping a living environment with economic interaction, despite the habit of separating these two uses spatially and financially. In addition, community perceives that mixing living and working adds value to the area and businesses, and contributes to the liveliness of Delft. Though, there are still doubts that shared mobility would increase in the area.

Existing business actors agree that the area vision needs to include both a housing and economic program combined. But developers see high-environmental category activities and large-scale manufacturers as an issue to develop housing. They consider these activities are already difficult to allocate in urban areas. On the other hand, some businesses raise concern of having rents increasing which puts them in disadvantage with new living activities.

Furthermore, Gemeente Delft does not see there is a defined and specific outcome, but a program and process that is managed through social interaction with people. Activities are already taking place in the area by community actors (e.g., Koperen Kat and Boulderhal) which enable meeting each other. Businesses consider that building on the existing network and meeting places is necessary to build community with new residents. Therefore, the first development projects (Cable District and Schiekwartier) are designed to use existing activities and allocate a mix of living and working. In addition, a mobility hub is being implemented and will be monitored to map out the effects in the short term and make adjustments.

Gemeente Delft intends to develop and mix in two phases, namely a well-defined one until 2030 and another one open for redirection until 2040 when other actors can get involved. Consultants suggest to communicate with people to develop place-making early. Therefore, developers use place-making events and spatial interventions to attract new residents. Nonetheless, community members feel their ideas are being copied to create meeting places and businesses raise concern of having rents increasing which puts them in disadvantage with new living activities.

Key Findings:

- Benefit is perceived from overlapping uses with a framed but not fixed outcome
- Local authorities facilitate discussion, interaction and involvement of actors
- Communication and clear operations management needed early to make adjustments
- Nourishment of existing activities and meeting places of community

- Long-term investment requires interaction with actors from high-environmental category activities
- Place-making events and spatial interventions are used to attract new residents to the community
- Existing business activities require awareness
- Rent support to prevent effects on businesses due to new living activities

Table 7 – Findings Overview Mixed-use Area

Arena	Stakeholder Sector	Elements of Analysis			
		Actors	**Area**	**Outcome**	**Strategies**
Mixed-use Area	**Public Service**	Local and regional authorities facilitate positive discussions between different users to make agreements about use of space	Benefit is seen from overlapping a living environment with economic interaction, despite the habit of separating these two uses spatially and financially.	The local authorities do not see a defined and specific outcome, but a program and process that is managed through social interaction with people.	Gemeente Delft intends to mix in two phases, a well-defined one until 2030 and another one open for redirection until 2040 when other actors can get involved
	Knowledge	Attracting high-tech manufacturers can facilitate the combination of work with living conditions to avoid issues	Population growth, household growth and housing shortage is creating an increasing pressure on space	A mobility hub will be monitored to map out the effects in the short term and make adjustments	Consultants suggest communicating with people soon to develop place-making
	Community	Diverse users are having a battle for space, but public space and meeting places (e.g., Lijm & Cultuur) can be taken into account for co-creation and building a community together	Community perceives that mixing living and working adds value to the area and businesses, and contributes to the liveliness of Delft. Though, there are doubts about increasing shared mobility	Activities are already taking place in the area (e.g., Koperen Kat and Boulderhal) which enable meeting each other	Community members feel their ideas are being copied to create meeting places
	Capital	Developers (e.g., Amvest, Kondor Wessels and AM) are long-term investors through joint ventures and alliances, making them a localized actor that interact with others in space	Developers see high-environmental category activities and large-scale manufacturers as an issue to develop housing. They consider these activities are already difficult to allocate in urban areas.	First areas to be developed (Cable District and Schiekwartier) are designed to use existing activities and allocate a mix of living and working	Developers use place-making events and spatial interventions to attract new residents
	Business	Businesses (e.g., Prysmian Group) discuss with developers to know each other. Awareness is stressed for people to know existing businesses	The area vision includes a housing and economic program combined, taking into account the existing businesses	Building on the network and meeting places are considered necessary to build community with new residents	Businesses see as threat the increasing prices of space because of combining with other activities

Urban Manufacturing

TU Delft and innovation hubs, namely Yes! Delft and Buccaneer, for part of a knowledge-intensive ecosystem for businesses, despite not being specifically located within the area. This business ecosystem is seen by the community as a good starting point to co-create. The local authorities, in particular the business manager of Gemeente Delft, organizes meetings with the businesses to understand their operations and consult about their needs. Businesses with their own land and property are interested in investing in digital operations and lighter production. Besides, businesses in general are interested in space growth and affordability, and proximity to clients, consumers and resources. Therefore, high-tech manufacturing is seen as attractive for the place but not large-scale manufacturers, especially because prototyping is seen as an attractive business to combine with housing for its cleaner process.

Gemeente Delft recognizes the area as a representative location with various ecosystems on knowledge development and prototyping. The space is used for industrial activities, namely production, service and storage, but knowledge actors consider it is not being used optimally. The area accounts for the highest space productivity in Delft and higher than average industrial areas in the region. Nonetheless, 70% of start-ups move to Rotterdam and The Hague to find space. Therefore, members of the business community are concerned about not connecting the local problems to the larger picture, for instance economic growth and environmental implications. In addition, resource management is considered important by public service actors to create an environment with economic interaction. Knowledge actors consider double use of space and management of public space important for high density and conservation of industrial heritage.

Investors and developers use their space to attract high-tech manufacturing and knowledge-intensive businesses, while relocating storage and low-value businesses. Moreover, facilities for the community, namely education institutions, are expected to be used for technology purposes. Besides, business actors perceive as key the connection to TU Delft Campus through different mobility modes, e.g., bicycle and walking.

Despite the importance of TU Delft, their involvement in participation meetings have been perceived as low and shocking. Nevertheless, managers from local authorities stay in contact with businesses to understand their needs and worries, but Covid-19 has impacted how they can approach to people. Community actors feel progress has been made in place-making strategies, but there is still a lack of understanding the identity of the businesses. Developers make efforts to discuss with companies, especially large-scale manufacturing (e.g., Prysmian Group), to avoid hindering each other's growth. Actors acknowledge the intention to stimulate and nurture existing businesses, but some are struggling to keep up with Covid-19, while others are aware they need to change or relocate in the long-term.

Key Findings:

- Local authorities have close contact with businesses.
- Resource management is key to create an environment with economic interaction
- Necessary involvement of knowledge actors to show commitment
- Consultants identify the need to create double use and optimization of space

- Businesses require investment in digital operations and high-tech manufacturing
- Operation processes are discussed between land owners and large-scale businesses
- Businesses are interested in space availability and affordability
- Proximity to clients, knowledge development and human resources is key for manufacturers and businesses.

Table 8 - Findings Overview Urban Manufacturing

Arena	Stakeholder Sector	Elements of Analysis			
		Actors	**Area**	**Outcome**	**Strategies**
Urban Manufacturing	**Public Service**	The business manager of Gemeente Delft organizes meetings with businesses to understand their operations and consult about their needs.	Gemeente Delft recognizes the area as a representative location with various ecosystems on knowledge development and prototyping	Resource management is considered important to create an environment with economic interaction	Managers from Gemeente Delft stay in contact with businesses to understand their needs and worries. Covid-19 has impacted how they can approach to the people.
	Knowledge	TU Delft and innovation hubs (e.g., Yes! Delft and Buccaneer) form part of a knowledge-intensive ecosystem for businesses	The area is used for industrial activities, namely production, service and storage, is not being used optimally	Double use of space and management of public space is considered important for high density and conservation of industrial heritage	Despite the importance of TU Delft, their involvement in participation meetings have been perceived as low and shocking
	Community	The business community is seen as a good starting point to co-create	Participants from the business community are concerned about not connecting the local problems to the larger picture, for instance economic growth and environmental implications	Facilities for community, namely education institutions, are expected to be used for technology purposes	Community members feel progress has been made in place-making strategies, but there is still a lack of understanding the identity of the businesses
	Capital	Businesses with their own land and property are interested in investing in digital operations and lighter production	Prototyping is seen as an attractive business to combine with housing, especially because they need space and it consist of a cleaner process	Investors would use their space to attract high-tech manufacturing and knowledge-intensive businesses, while relocating storage and low-value businesses	Developers make efforts to discuss with businesses, especially large-scale manufacturing, to avoid hindering each other's growth
	Business	Businesses are interested in space availability and affordability, environmental impact, and proximity to clients, consumers and resources. High-tech manufacturing is seen as attractive for the place but not large-scale manufacturers	The area accounts for the highest space productivity in Delft and higher than average industrial areas in the region. Nonetheless, 70% of start-ups move to Rotterdam and The Hague to find space to grow	Business actors perceive important the connection to the TU Delft Campus through different mobility modes (e.g., bicycle, walking)	Actors acknowledge the intention to stimulate and nurture existing businesses, but some are struggling to keep up with Covid-19, while others are aware they need to change or relocate in the long-term.

Scenario Planning

5. Scenario Planning

5.1. City of the Future

This research is done through the studio of *City of the Future*, which facilitates the exploration of urban development through diverse challenges and perspectives. Therefore, this exploration adopts a divergent, inductive, and explorative approach to be able to understand the problem from a multidisciplinary perspective. Berkers (2020) refers to urban development as a continuous game with constant changes. Chen et al. (2019) discuss how interdisciplinary and experiential learning in urban development management can be done through a "game" where different perspectives are encountered to deal with issues of urban areas. This can be compared to interactions of actors in arenas for specific issues or cases. Besides, Snellen & Hamers (2020) state in their urban development report *Rehearsing the Future* that "the future cannot be predicted, but it can be explored" (p. 7). Borra & Urhahn (2020) make similar references, regarding ecosystems that cannot be designed because they are constantly changing. These analogies reveal increasing attention on exploring the future, the arenas where actors interact, and awareness on how the game changes.

Snellen & Hamers (2020) have been exploring future scenarios to address urban development challenges, infrastructure, and mobility in The Netherlands. Through a systematic and creative process, they present scenarios that describe possible futures with different governance structures, sustainability changes, and societal aspects. Nonetheless, the scenarios are just opening the door to what the future could be in 30 years and illustrates a general image of urban development. Snellen & Hamers (2020) present four scenarios, namely Bubble City, State of Green, Market Place, and Our Neighborhood (see Fig. 21). Taking these as a reference, this research makes an argument on how changes in urban manufacturing can create different possible future scenarios for industrial urban areas. For example, Agrawal et al. (2020) and Culot et al. (2020) have been already addressing the importance of reimagining the future of manufacturing given the impact of Covid-19 on technology (e.g., industry 4.0).



Figure 21 - Scenarios from Snellen & Hamers (2020)

Therefore, a scenario planning approach is relevant to understand the forces behind manufacturing and industrial urban area development, and identify possible scenarios supported by those presented by Snellen & Hamers (2020). In other words, this exploration adds a new layer to existing knowledge of future scenarios. According to Lindgren & Bandhold (2009b) scenarios are not visions or forecasts, but "vivid descriptions of plausible futures" (p. 23). Thus, working with scenarios is about identifying patterns, trends, and forces in the present and past conditions to create a relevant framework with opportunities and challenges. By doing so, it is possible to be aware of the challenges when directing effective strategies.

5.2. Scenario Planning

Following the ideas of Dewulf et al. (1999), scenario planning is done by identifying the relevant trends and cluster them. This is already done in the chapter of theoretical framework, in which trends are clustered into nine forces. To assess these forces, an impact-steerability matrix is done (see Fig. 22). The forces in the upper-right space can be used for strategy design, while the ones in the lower right space are assessed with an impact-predictability matrix (see Fig. 22). In the impact-predictability matrix, the upper space can be used again to form strategies, while the forces with the highest impact and lowest predictability should be used for scenario analysis. The two with highest impact and less steerability are placed in axes of a matrix to create possible scenarios (see Fig. 22).

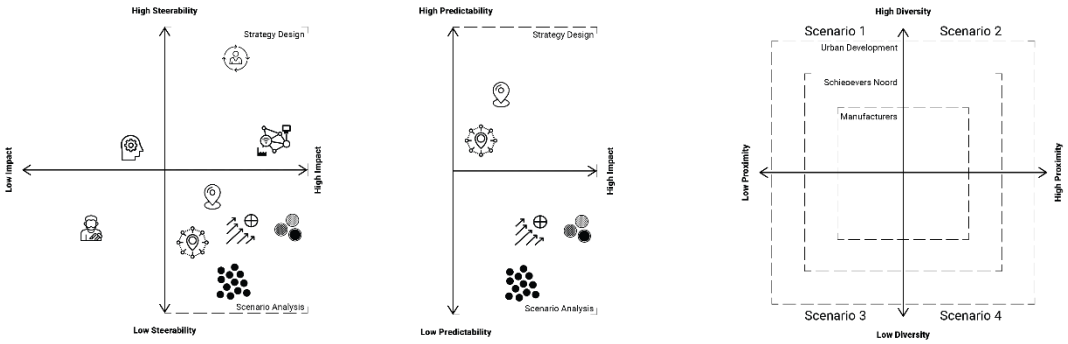

Figure 22 - Scenario Planning (own image)

This process creates four possible scenarios in relation to proximity and diversity. Diversity is a force that has low predictability since manufacturing is becoming multi-functional, relying on diverse services and products offered to supply demand. Besides, demand is changing constantly which is accentuated in urban areas and global markets, impacting the supply of products and built environment. Nonetheless, specialization in specific products and the development of common interests in neighborhoods makes diversity difficult to predict. Moreover, proximity is less predictable with an increasing online communication and social distance due to Covid-19, affecting the physical proximity of people. Still, densifying urban areas is needed to fulfill sustainability and mobility goals, and businesses look for shortening supply chains by increasing proximity to suppliers, related services and consumers.

The resulting scenarios are Economic Hotspot, Mix & Make, e-Cosystem and Local Leverage. This possible scenarios overlap the scenarios of Snellen & Hamers (2020) to make connections to possible changes in urban development, mobility and infrastructure in the general context of The Netherlands. These scenarios are presented in the following sections through the description of changes in the three arenas of the theoretical framework. Then, empirical findings and scenarios are discussed to present possible directions towards place-making strategies.

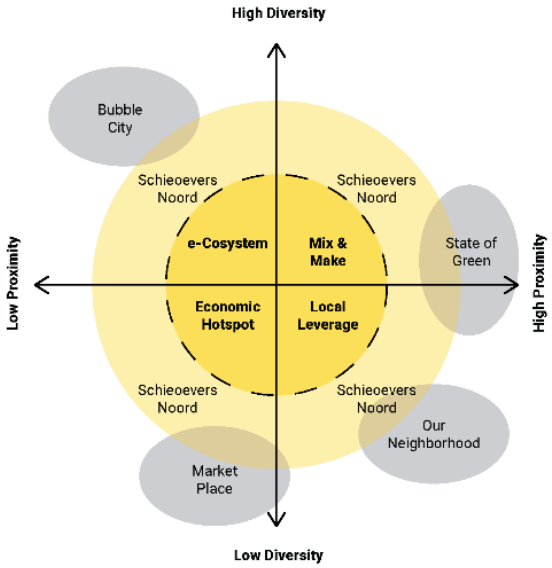

Figure 23 - Scenarios

5.3. Scenario: Economic Hotspot

Economic Hotspot is a scenario based on low proximity and low diversity.

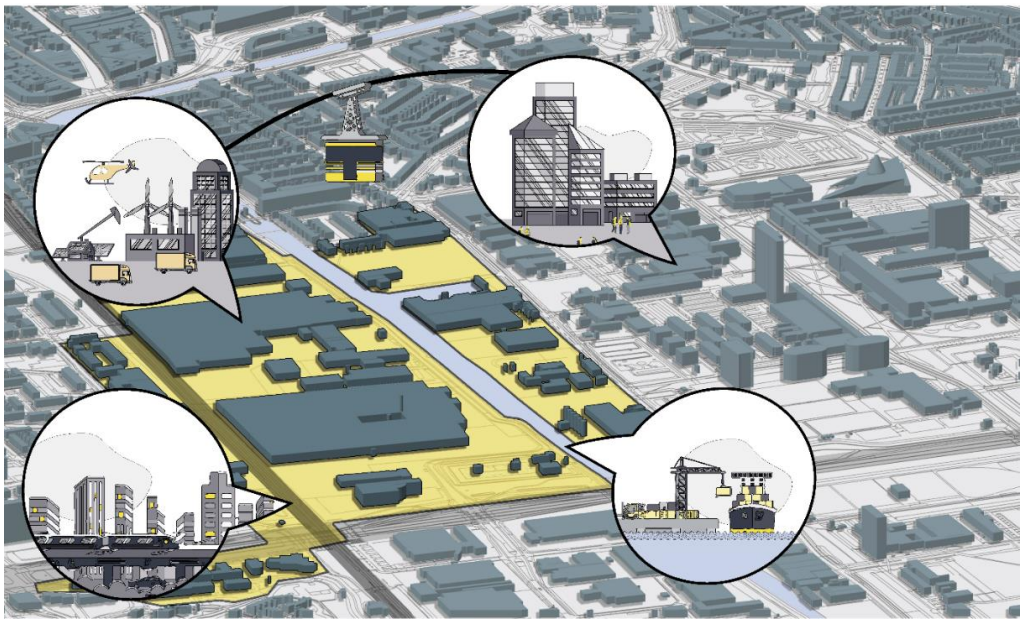

Figure 24 - Scenario Economic Hotspot (own image)

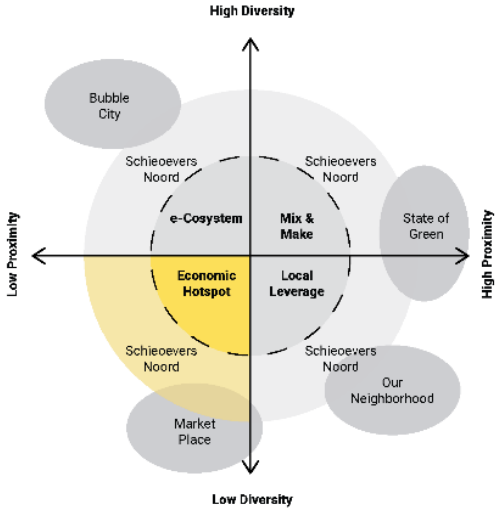

Figure 25 - Scenario Economic Hotspot (own image)

Urban Area Development

Society becomes increasingly competitive and focused on a global market, resulting in global strategies to boost the local economy and opening the economy to market cycles (Wu, 2000). Economic growth is recognized, so foreign investments are done by large corporations, e.g., Prysmian Group, in the area and private parties, e.g., Kondor Wessels, within the market lead the redevelopment process according to their interests. This results in investors to new forms of automated manufacturing based on high productivity and performance, and aiming for financial competitiveness (Blackwell et al., 2017) Existing businesses, including large-scale manufacturers, benefit from these decisions, and new similar companies are relocated in the area. In addition, the BKS remains a lobby network for local businesses, but most companies establish global networks based on their supply chains.

To accommodate large-scale manufacturers and heavy logistics, investment is done on infrastructure to specialize in storage and logistics. For instance, the Schie canal is intensified in ship logistics and transportation. Besides, public space is used as an asset to rent for business operations. Consequently, keeping the management and operations of the public space results on high expenses for Gemeente Delft. This results on selling the rights of public space to the companies to compensate for the large investments done. Therefore, local authority lose leverage over development decisions and remain with limited financial power.

Mixed-use Area

The area remains monofunctional, autonomous and “shifts away” away from the city to strengthen links with global actors and do not depend on local actors (Hatuka & Ben-Joseph, 2017). The area has low accessibility to adjacent neighborhoods and TU Delft Campus, and living facilities are no longer developed, developing different socio-economic profile compared to neighbor areas. Gemeente Delft invests on a cable car as mode of transportation to connect with the area. In addition, housing in Cable District and Schiekwartier is transformed to accommodate offices and service providers. Therefore, social interaction is based on a business community, replacing cultural actors present in the area, e.g., Lijm & Cultuur, with technology hubs.

Urban Manufacturing

Technology hubs and incubators become increasingly relevant in the area due to large investments from corporations. This facilitates a rapid growth of start-ups but several of them are sold out to large-scale manufacturers. Besides, TU Delft and other high-tech institutions become semi-privatized due to exclusive agreements with the corporations. Capturing this talent allows companies to improve their operations and systems.

5.4. Scenario: Mix & Make

Mix & Make is a scenario based on high proximity and high diversity.

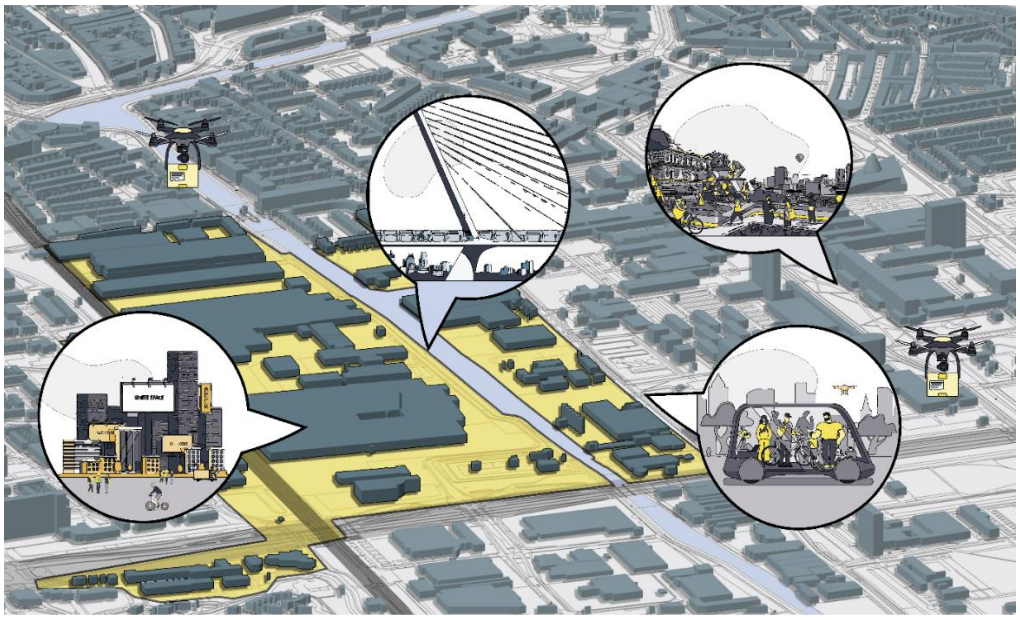

Figure 26 - Scenario Mix & Make (own image)

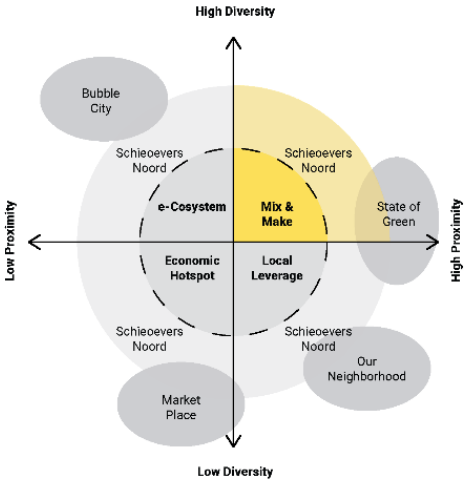

Figure 27 - Scenario Mix & Make (own image)

Urban Area Development

Gemeente Delft gains power with the implementation of a new zoning plan and an environmental framework that let them regulate activities and revise periodically to make necessary adjustments. Investments in the area are reflected on an added value growing in Delft as a whole and a balanced socio-economic profile. Capital actors continue to invest in the area with stable returns and the relocation of some large businesses, e.g., Basal, open the way for new actors to invest and develop projects.

Moreover, the BKS forms an independent public-oriented entity with the community to acquire properties and gain financial leverage. This entity creates a Schieoevers Fund to offer incentives for cleaner and lighter operations. In addition, TU Delft becomes more international, having 75% international students, and decides to invest in the area to develop student housing and knowledge-intensive programs for elderly, minorities and people with disabilities.

Mixed-use Area

The area becomes integrated with the city center, TU Delft Campus and residential neighborhoods. Accessibility and proximity are increased due to new forms of mobility and the construction of a new bridge. Besides highly mixed in every dimension, i.e., horizontally, vertically and with shared premises (Hatuka & Ben-Joseph, 2017; Hoppenbrouwer & Louw, 2005). This facilitates the development of living-working studios and environments, resulting in a new standard of living. Gemeente Delft stimulates and facilitates the combination of living and working, primarily by transferring responsibilities of public space to the independent entity formed by BKS and the community. This entity takes the role of curator of the area to connect actors, identify local needs and invest on high quality public space to be used in festivals and international events (Hill, 2020). These activities stimulate common experiences and interests resulting in a strong neighborhood-based organization (Martin, 2003).

Urban Manufacturing

Large-scale businesses decide to change their operations to lighter forms of production using incentives from the Schieoevers Fund. For instance, Basal innovates in concrete 3D printing and transforms the existing concrete plant. Other large-scale companies transform their facilities to reduce the footprint and include new forms of production. Besides, high-tech businesses, e.g., Flying Fish, continue to grow in the area and collaborate with new startups from technology incubators.

5.5. Scenario: e-Cosystem

e-Cosystem is a scenario based on low proximity and high diversity

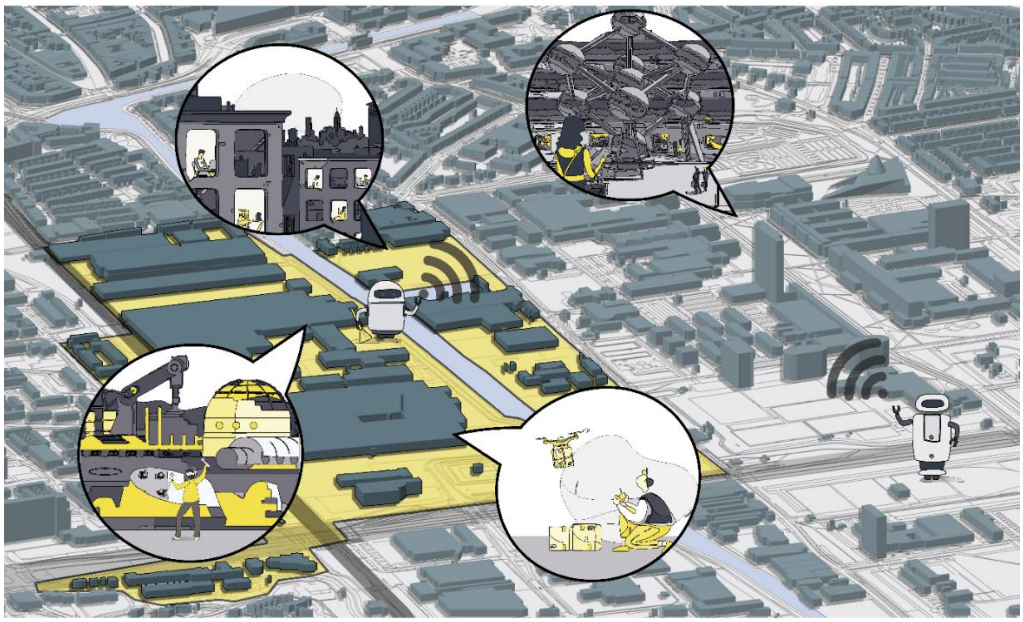

Figure 28 - Scenario e-Cosystem

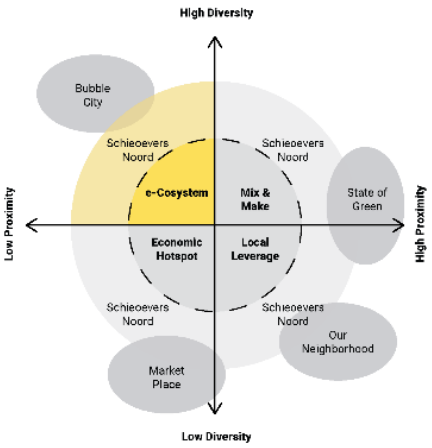

Figure 29 - Scenario e-Cosystem (own image)

Urban Area Development

The BKS makes a collaborative agreement with developers and investors, in particular Amvest, Kondor Wessels and AM. This agreement establishes the commitment to work based on decentralized networks based on interests and industry "guilds". This facilitates crowd sourcing investment to develop new projects. Moreover, new forms of investment are created with collective funds from Schieoevers Noord, Binckhorst, Makers District and Strjp-T. The BKS gains new members from inside and outside the area, increasing its collective leverage outside Schieoevers. This creates a constant change of users, visitors and residents, looking for temporal rents and less ownership of property.

Furthermore, TU Delft and Gemeente Delft invest in digital operations to enable collaboration and networking. Therefore, investments in real estate are redirected towards virtual platforms resulting in a mix of physical and digital development, i.e., phygital development.

Mixed-use Area

The area remains adjacent but isolated from the rest of the city, creating a specialized industrial environment that promotes innovative technology but being "out of place" (Hatuka & Ben-Joseph, 2017). Therefore, connectivity increases in time but not space and mixed-use is implemented in time, e.g., double use of space. (Hoppenbrouwer & Louw, 2005). New residents and users apply virtually for use through Airbnbn-like platforms while community organizations use Twitch-like platforms for live streaming events. In addition, the development of Internet of Things facilitates the curation and allocation of different activities using big data.

Urban Manufacturing

The industry 4.0 solidifies with manufacturers relying heavily on big data and blockchain (Agrawal et al., 2020). This leads to the growth of prosumers and the production of built environment on demand using large scale 3D printers and additive manufacturing (Culot et al., 2020).

Gemeente Delft, investors and developers create an open-source material data base to monitor and manage construction materials, resources and waste in the area. On the other hand, large-scale manufacturers, e.g., Hordijk and Prysmian, outsource their production and operations, resulting in smaller footprints.

5.6. Scenario: Local Leverage

Local Leverage is a scenario with high proximity and high diversity

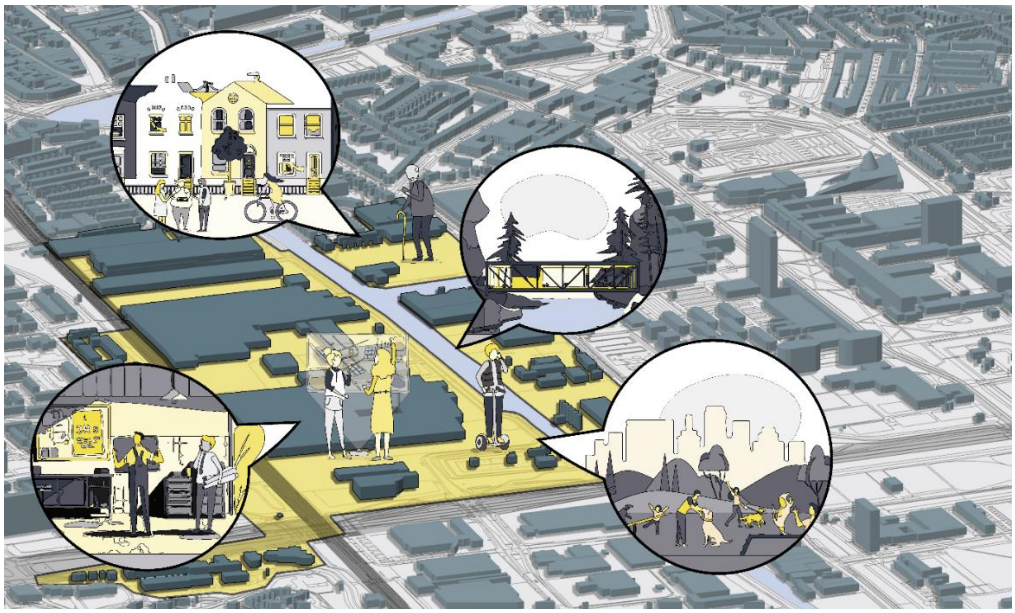

Figure 30 - Scenario Local Leverage

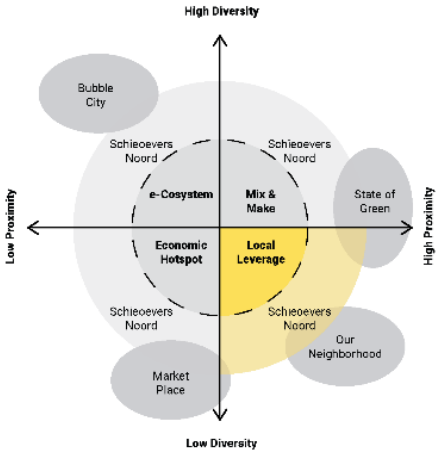

Figure 31 - Scenario Local Leverage (own image)

Urban Area Development

New political parties shift away from the EU and increase budget of local authorities, making them have more financial power. Gemeente Delft promotes the 15-minute city as the norm while implementing a special regulatory framework for production and living activities similar to other areas in the Netherlands (e.g., NDSM Amsterdam). Meanwhile, the BKS becomes investor in the area with the support of TU Delft, allowing them to purchase property from large-scale businesses, e.g., Prysmian Group. All of this leads to a decrease of international companies in the area and international students in TU Delft.

Mixed-use Area

The area is integrated with the rest of the city and mixed-use is implemented horizontally (Hatuka & Ben-Joseph, 2017; Hoppenbrouwer & Louw, 2005). People live and work in the area without commuting long distances. In addition, local residents create collective organizations to support local values through bottom-up initiatives and events in public space and existing meeting places, e.g., Lijm & Cultuur and Koperen Kat. This stimulates community building, local production and consumption.

Urban Manufacturing

Made in Delft becomes the driver for new businesses and a proximity label is implemented for construction and production. Small scale working and living combined becomes the new lifestyle, incorporating food production and home manufacturing. Moreover, the sustainable craftmanship rises and embraces innovation in materials and technology while respecting traditions (Campana & Cimatti, 2013).

Furthermore, equipment and facilities of the relocated Prysmian Group are used to produce cables for the development of an underground smart grid. This decision stimulates energy symbiosis between businesses and houses which is used for research by TU Delft and knowledge-intensive businesses.

5.7. Future Schieoevers Noord

The four scenarios, namely Economic Hotspot, Mix & Make, e-Cosystem, and Local Leverage portray divergent but plausible futures of the area within the arenas of Urban Area Development, Mixed-use Area and Urban manufacturing. These scenarios can exist independently or within a combination of them, making the future highly complex. Nonetheless, these descriptions help to have more clarity on what changes could happen. In addition, they reveal possible alignments or conflicts between the existing strategies of Schieoevers Noord and what actually could happen. Consequently, these create opportunities and challenges which are presented to establish directions for place-making strategies.

Urban Area Development

Across all of the scenarios, they share the attraction of development interests based on a knowledge ecosystem, primarily because of the presence of TU Delft. Besides, in every scenario, businesses are references and ambassadors to attract investment in the area, either from global or local parties. Good relationships between public and private parties are mostly relevant in the development of the area of the scenarios. Besides, meeting places and public participation, and co-creation and connectivity seem key drivers in every scenario but Economic Hotspot. Furthermore, public ownership of public space and infrastructure, and public support are indifferent in e-Cosystem due to a decentralized society, while conflicting with Economic Hotspot given the private-led process. Finally, land ownership is a trigger for Economic Hotspot and Mix & Make, indifferent for Local Leverage, but conflicting with e-Cosystem. This is the result of a growth in the virtual world and the presence of digital platforms for interaction, reducing the importance of owning land.

Opportunities:

- Good relationships between development actors
- Business actors as ambassadors of the area
- Creation of meeting places and public participation
- Co-creation and connectivity

Challenges:

- Dependency on private land ownership
- Reliance of public support for business development

Table 9 - Assessment Urban Area Development

Arena	Empirical Findings	Economic Hotspot	Mix & Make	e-Cosystem	Local Leverage
Urban Area Development	**Good relationships of public and private parties**	0	+	+	0
	Public ownership of public space and infrastructure	-	+	0	+
	Knowledge ecosystem attraction	+	+	+	+
	Meeting places and public participation	-	+	+	+
	Co-creation and connectivity	-	+	+	+
	Private and ownership as trigger	+	+	-	0
	Public support for business development	-	+	0	+
	Business ambassadors as references	+	+	+	+

Mixed-use Area

All scenarios have a common alignment on communication and operation management, although they differ on which actors follow this, for instance Economic Hotspot rely on private parties, in Mix & Make it is done by BKS and the community and e-Cosystem relies on a decentralized network. Both, Mix & Make and Local Leverage align with most findings of current strategies, though they differ on the extent of creating diversity, if rents have to be monitored, and their involvement in global and local dimensions. Besides, Economic Hotspot differs from having benefit of overlapping uses, facilitating discussion, interaction and involvement, and the awareness of existing businesses. On the other hand, e-Cosystem portrays a scenario based on temporary activities with less long-term investment and commitment. Finally, attention can be made on the conflict of Economic Hotspot and e-Cosystem with their indifference to existing activities and meeting places, and the lack of place-making events and spatial interventions. Nonetheless, in e-Cosystem these concepts are transferred to online platforms and a virtual dimension.

Opportunities:

- Communication and operation management
- Discussion, interaction and involvement
- Long term investment and commitment
- Awareness of existing businesses

Challenges:

- Lack of consideration of existing activities and meeting places
- Reliance on events and spatial interventions
- Rent increase

Table 10 - Assessment Mixed-use Area

Arena	Empirical Findings	Economic Hotspot	Mix & Make	e-Cosystem	Local Leverage
Mixed-use Area	**Benefit from overlapping uses**	-	+	0	+
	Facilitate discussion, interaction and involvement	-	+	+	+
	Communication and operation management	+	+	+	+
	Nourish existing activities and meeting places	-	+	-	+
	Long-term investment and commitment	+	+	-	+
	Place-making events and spatial interventions	-	+	-	+
	Awareness of existing businesses	-	+	+	+
	Rent support	-	+	-	0

Urban Manufacturing

Throughout all of the scenarios, overlaps from the current strategies are seen in resource management, involvement of knowledge actors, investment in digital and high-tech operations and some proximity to clients, knowledge development and human talent. Economic Hotspot conflicts with having a close contact with businesses, optimization of space, operation awareness and space availability and affordability. Mix & Make and Local Leverage align with these concepts of the current strategy, but they differ on the degree of space densification and the power of the local authorities to facilitate contact with businesses and ensure space affordability. Last, e-Cosystem is indifferent about space availability and aligns with optimization of space and operation awareness but the implementation of strategies is mainly through digital operations, shared use of space in time and awareness in online platforms.

Opportunities:

- Resource and business management
- Involvement of knowledge actors
- Investment in digital and high-tech operations
- Proximity to clients, knowledge development and human talent

Challenges:

- Reduced space availability and affordability
- Not optimized space
- Lack of operation awareness

Table 11 - Assessment Urban Manufacturing

Arena	Empirical Findings	Economic Hotspot	Mix & Make	e-Cosystem	Local Leverage
Urban Manufacturing	**Close contact with businesses actors**	-	+	+	+
	Resource management	+	+	+	+
	Involvement of knowledge actors	+	+	+	+
	Double use and optimization of space	-	+	0	+
	Investment in digital and high-tech operations	+	+	+	0
	Operation awareness	-	+	0	+
	Space availability and affordability	-	+	0	+
	Proximity to clients, knowledge and human talent	0	+	+	+

Directing Place-making Strategies

Given the opportunities and challenges revealed across the arenas, it is possible to recommend how to manage the stakeholders and direct the process with specific actions.

Urban Area Development - Build on Ambassadors

Area development builds on positive relationships between local authorities, investors, land owners, community and knowledge actors. Such is the case currently in Schieoevers Noord, despite undergoing struggles in the past. However, some land owners are still not actively involved in the process, in particular large-scale manufacturers. These actors have a passive role in the development arena but they have valuable resources to offer and can be portrayed as ambassadors of the area or references on how large-scale businesses are currently operating and which are their strategies to become more environmentally friendly. Nonetheless, challenges of large-scale manufacturers have to be acknowledged to discard assumptions and biased expectations that every business can transition rapidly into high-tech processes or reduce spatial footprint.

To activate these ambassadors, understanding their businesses and building trust is key. Local authorities can provide incentives to large-scale manufacturers to develop business models based on spaces in their properties that can be leased out to the business association. The business association, in collaboration with the large-scale manufacturers, can manage the space to temporally accommodate new related businesses searching for the best fit in the area. Consequently, the new businesses can develop relations with existing users, and the large-scale manufacturers can find partners that help them grow or innovate their processes. While some spaces are already being developed in the area for start-ups, they are distant from the large-scale manufacturers or owned by external investors. Given the importance of the large-scale manufacturers in a scenario like Economic Hotspot, it is key to activate them with strategies that take them into account. Thus, developing business spaces with the active participation of large-scale manufacturers and the business association can stimulate interaction within the area, create links within the network, benefit their activities and strengthen their role as ambassadors.

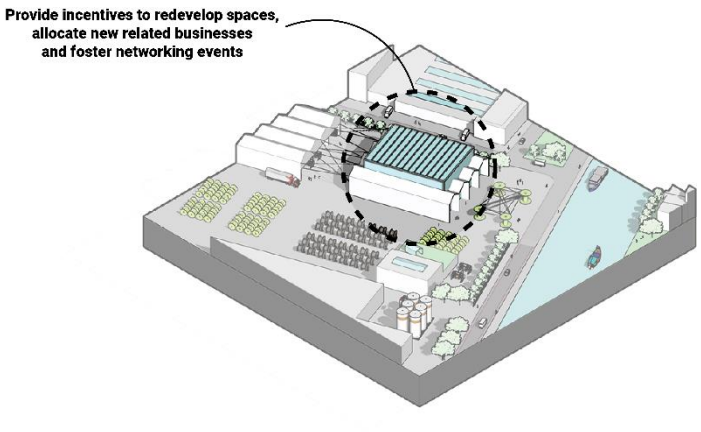

Figure 32 Build on Ambassadors (own image)

Looking closer at Schieoevers Noord, a suitable location to intervene could be the property of Prysmian Group, in particular the Northern part. This site is key as a link towards the city center and the existing bridge towards TU Delft Campus. A section of this property can be leased out to the BKS and transformed into a multifunctional hub with the purpose of allocating temporal businesses related to Prysmian's activities and foster networking events. Besides, the space can be used as public space closer to the city center and an exhibition venue to show a glimpse of the business operations.

Urban Area Development - Co-create to Connect

Participation processes are usually presented as successful strategies to involve users and interested parties; however, they can end up being unilateral and informative sessions rather than delegating decision-making to less empowered actors. Nonetheless, place-making should consider sessions for co-creation to develop alternatives for public space and infrastructure that follow the desires and needs of users. While some projects have already been started in the area, e.g., train station and tunnel, and others are planned for short-term future, e.g., bridge, the users have stressed that there is a lack of involvement in the design and development; in particular the bridge and tunnel which are seen as fundamental for connectivity to the surrounding areas. Hence, active public participation is key in this process to strengthen the relationship and build trust between actors in the development arena, especially considering the available high-skilled talent and knowledge present in Delft. Therefore, local authorities could launch open competitions to explore ideas for connectivity. This can be done with the involvement of existing users, TU Delft students and experts to find innovative solutions for the problem. However, proposals should not be taken as independent elements but a complete connectivity plan to integrate the area with the city, especially considering the scenario Mix & Make where urban integration is a key driver.

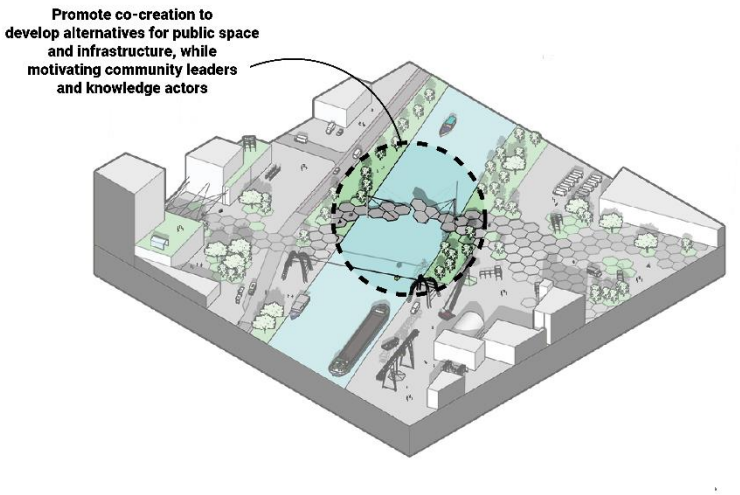

Figure 33 Co-create to Connect (own image)

Local authorities can motivate existing community leaders, e.g., Lijm & Cultuur, and knowledge actors, e.g., TU Delft, to use existing open spaces for experimentation to find feasible solutions for mobility and infrastructure. This experimentation can be implemented parallel to exhibitions to inspire designers to come with ideas for the bridge and tunnels as both infrastructure and public space. To do so, compensation can be given through financial incentives or funding from technology hubs, i.e., Innovation Quarter. While the process could take longer than a conventional tender process, it can engage existing users, attract new actors and find innovative solutions that have not been explored, resulting in higher quality and acceptance.

Mixed-use Area - Develop Awareness

Businesses, in particular manufacturers, need to reach large markets and the community to connect their products and services to people. Activities and production processes in industrial areas tend to be in hidden from the community and the rest of the city, which makes businesses lose connection with the local economy. Besides, it is harder for people to understand how manufacturing businesses can fit within urban areas. Therefore, awareness of their business activities should increase, both physically and digitally, to reach a larger audience and inform about how they contribute to the city and society. Individual businesses usually struggle to organize or finance campaigns to develop awareness, but a collective effort is needed through the business association to promote what is produced and offered locally. Considering the conditions of the scenario Local Leverage, develop awareness is essential for local businesses to grow.

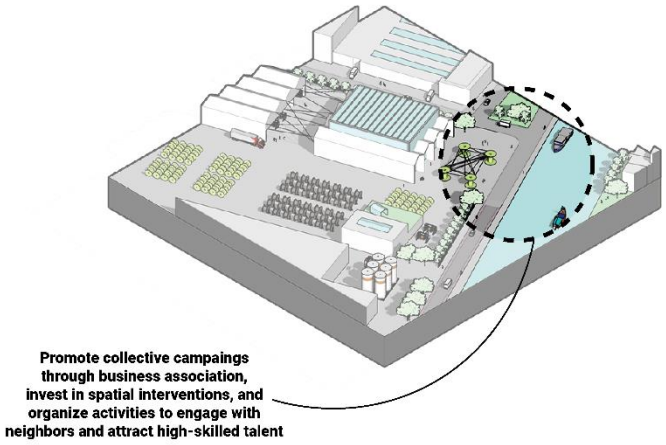

Figure 34 Develop Awareness (own image)

For example, it is important for the BKS to communicate early with possible future residents of the area and professionals coming out from TU Delft. Thus, collaboration and open communication is needed between the BKS, local authorities and TU Delft. Especially, more attention should be put on how to reach international students to capture foreign high-skilled talent and allocate adequate housing to make use of diversity. Besides, awareness can increase through interaction and involvement of the general public via workshops, tours in the existing facilities and pop-up activities in the city center or TU Delft Campus. Moreover, place-making events and spatial

interventions should continue to be promoted in the whole area with the goal of stimulating sense of community and local economic growth. These events and interventions can be financed through a place-based fund. For instance, a Making Week can be launched as a platform for competitions and workshops focused on prototyping and high-tech manufacturing in the region, while collected funds can be used to reinvest in the area.

Mixed-use Area - Decentralize Curation

Areas in process of redevelopment need a coordinator, community manager, or facilitator, among others. These roles are focused on helping the neighborhood by identifying needs, connecting actors, communicating and protecting interests. However, within an industrial area it could end up relying on the business association. In the case of Schieoevers Noord, the area manager from the municipality assumes this main role for the whole area, while some developers curate their own block. Nevertheless, there is urge to stop relying only on few actors outside of the community, especially those in political and market sectors with changing interests. Besides, there are few people that really have an overview of the existing users in the whole area. This could be overcome by decentralizing information and decision-making power among actors, while considering the risk of privacy issues and exposure of commercial information.

However, as described in the scenario e-Cosystem, decentralized networks are becoming more relevant with crowd-sourcing, big data, internet of things (IoT) and block-chain technology. All of these make great use of collective leverage if implemented carefully. Curation of the area can be done through a decentralized system that offers transparency of the process, and can be monitored for collective interests while keeping privacy standards.

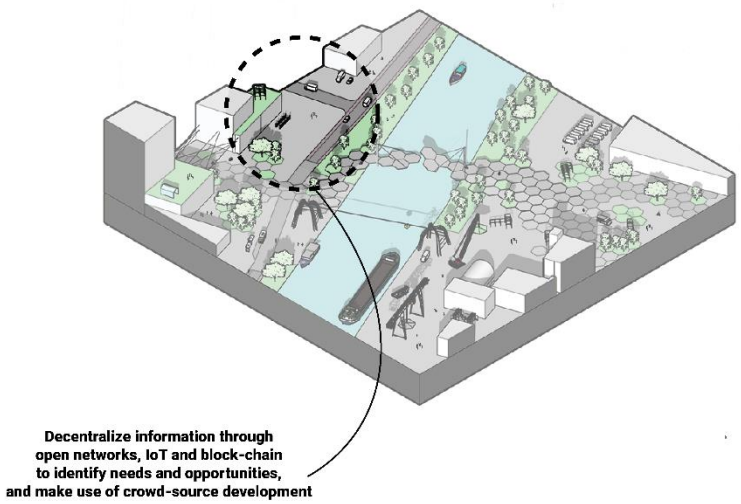

Figure 35 Decentralize Curation (own image)

Looking closer at Schieoevers Noord, an independent entity can be created by the BKS, local authorities and TU Delft to collect data throughout the area and implement an open system that keeps track of the operations to optimize the allocation of new activities and

the resource management. Besides, it can be used openly to identify needs, foresee conflicts and take advantage of opportunities, e.g., crowd-source development. This open system can be firstly implemented with a specific land owner to monitor space in use to find future opportunities for development, and later escalate to the whole area of Schieoevers Noord when the model gains acceptance.

Urban Manufacturing – Innovate Operations

Both area development and manufacturing are commonly related to the physical dimension, in particular construction and manual production. However, these activities are getting more complex due to the collaboration with various actors and the diversification of services, as it can be seen in the scenarios of e-Cosystem and Mix & Make. Hence, digital and online operations are becoming more important in the production of cities and products to reach a larger audience and manage complex processes. Besides, Covid-19 has had implications in the way people interact physically and how spaces are used. This urge to be present in online platforms must be translated into innovative opportunities for participation processes, digitalization of information and high-tech manufacturing processes.

To overcome spatial limitations and environmental issues, large-scale manufacturers should invest in digital operations and innovative processes. These businesses can make long-term investments in new technologies when they see commitment from local authorities to collaborate with them. Hence, transitions to digital operations and high-tech manufacturing are linked to incentives and policies that establish a feasible framework and stimulate innovation.

Furthermore, development and participation should follow these same concepts to adapt to new demands and technologies. Despite the desire to continue with a personal approach in meetings, the new conditions urge for new means of interaction and management. Investments are needed in virtual platforms to reach larger audiences and manage data in development processes.

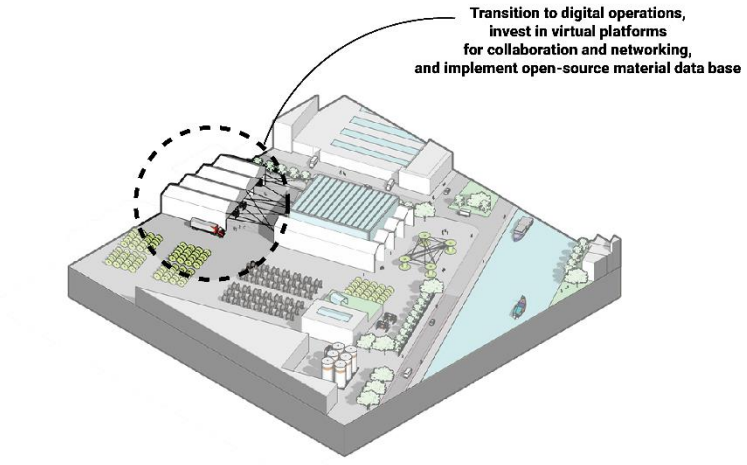

Figure 36 Innovate Operations (own image)

Regarding Schieoevers Noord, local authorities can make better use of new online platforms for participation processes to reach more actors and facilitate interaction. This is key to engage with existing and future users, collaborating with those actors who are interested, activating the ones that are indifferent and motivating the actors with disagreements. Moreover, the BKS must transition to virtual platforms to enhance collaboration between businesses and make use of networking to connect actors within supply chain. Businesses, in particular start-ups or small-scale companies, can cooperate together to use digital platforms that share real-time use of space and the type of activity to facilitate merging operations, sharing spaces and reducing costs. Finally, TU Delft could assume the role of leading actor to create a think tank dedicated to innovate Schieoevers Noord and its businesses, especially launching an open-source material data base to manage efficiently materials, resources and waste.

Urban Manufacturing - Optimize Space

Industrial areas tend to consist of large plots that are not optimally used due to one story production facilities, parking lots or space for stock and logistics. Besides, some of these spaces could be vacant or in a state of blight given a low state of the economy or little concern from the land owners. This is self-contradictory if we consider the scarcity of land in most urban areas. Solutions have to be found through mixed-use or transitional uses to activate the area and intensify the available space. Nonetheless, some uses, in particular manufacturing activities, may hinder vertical mixing because of nuisance and regulatory restrictions.

Explorations can be done to take advantage of these spaces by testing new ideas, for instance, double use of space through time. Businesses with large space for storage tend to operate with flow of stock, increasing or reducing their stock occupancy according to demand. Therefore, discussing with these businesses about their operations can enable the double use of space in time for temporary activities. These activities should be taken as explorative transitions rather than ephemeral uses. In other words, implementing trials can reveal potential solutions to develop vertical mixing and long-term business models. Moreover, mixed-use in both vertical and time dimensions are specifically important to be adapt successfully within the scenarios e-Cosystem and Mix & Make.

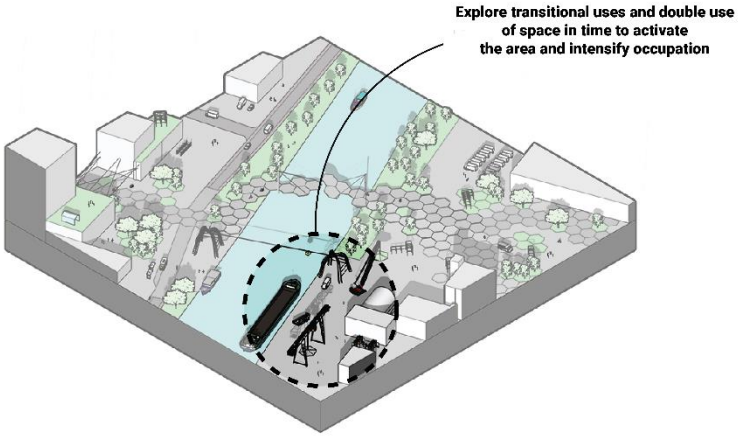

Figure 37 Optimize Space (own image)

In the case of Schieoevers Noord, explorative trials can be done in the properties of large-scale manufacturers where land is not used optimally. This can be stimulated through place-based financial levers, i.e., special local incentives, implemented by local authorities. Therefore, these businesses, such as Prysmian Group or Dyckerhoff Basal, could be motivated to make available space in time for temporary activities. The temporary activities could be place-making events organized by the community or BKS, or production test runs for start-ups from TU Delft, Yes! Delft, Buccaneer, among others. Finally, these trials can be used to find feasible solutions that provide financial benefits for the land owners (e.g., rents), space availability for start-ups, socio-economic interaction between users and a long-term transition to mixed-use and space optimization.



Figure 38 Intervention A (own image)

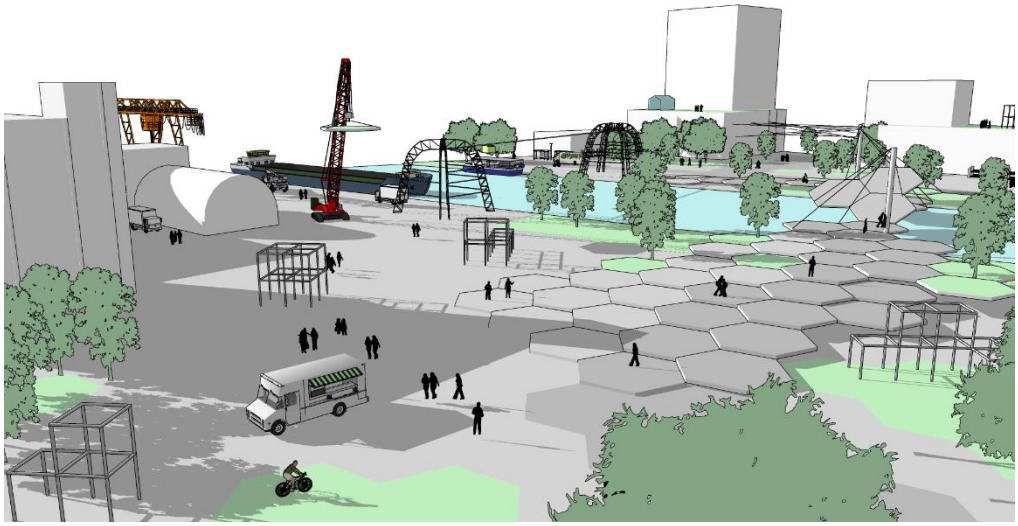

Figure 39 Intervention B (own image)

Discussions & Conclusions

6. Discussions & Conclusions

6.1. Discussions

Research Process

Exploring place-making in industrial urban areas is definitely not a straightforward process. In fact, it requires a complex iterative process to understand different aspects of the problem. This supports the theory of *Circle of Engagement* from Susskind (2013), which comprehends the complexity of shifting from theory to practice, and from analysis to prescription. Besides, the iterations support the dilemma presented by Sennett (2008) which argues the problem caused by facing the quality of correctness, i.e., the absolute standard of how it should be done, with the quality of practical experience. In other words, the actor at hand is presented with divergent directions on how to approach a task. Moreover, it has been noticeable how interrelated are the processes of urban redevelopment and manufacturing, in particular in industrial urban areas. While each process has its own scale and complexity, both of them require iterations, learning from errors, innovation and social interaction to produce an outcome that has value for people.

Furthermore, Hill (2020) suggests applying a pattern language to address different interests and needs of urban development processes, though their types of application, namely analyzing, visioning, designing and monitoring involve the collaboration with the stakeholders of the case. Therefore, following the research as an external party, requires a different approach on how to apply the theory. In fact, after discussing with a researcher from *Foundries of the Future*, it was made clear that application tools in urban development should be used according the specificities of the case (BH, researcher of TU Delft, 2021). In other words, there is no "golden rule" to approach the complexity of these "wicked" problems in area development. Besides, using knowledge from Dewulf et al. (1999) and Lindgren & Bandhold (2009a) allows to have a research approach based on exploring future scenarios, especially to follow the research within the studio of *City of the Future*.

The qualitative approach of this research and the methodology used, while not being perfect, is suitable to explore the way actors interact in arenas for specific issues. In spite of limited access to the people involved in the case, the research has been done using the available resources, for instance the participation process meetings of Schieoevers Noord. This was not only used as an emergent strategy for data collection, but it ended up being much more insightful due to the wide range of actors present in the meetings. Some of these actors had constant presence in the meetings and were available to be interviewed, which shows their relevance in the case and disposal to share information. Nonetheless, when having an interview with three external experts, it was interesting to hear their perspective over the case. The three of them, despite not being active stakeholders in the case, had a slight negative perception of the case due to the failed attempts to redevelop and the convoluted discussions between stakeholders.

Research Product

The findings of the empirical analysis represent key insights on how actors interact in the arenas Urban Area Development, Mixed-use Area and Urban Manufacturing. It reflects how the power and interests of stakeholders can influence the process in shaping a place. As mentioned by Carmona (2014), this relationship of power between agency and structure steers the flow and outcome of the process. In addition, Daamen (2010) argues the arena is the place where actors involved make decision with the intention of making progress in the realization of the project. In the case of Schieoevers Noord, and other industrial urban areas in process of transformation into mixed-use areas, it is indeed a complex process with three arenas. For this reason, a distinction is made on the three arenas due to the way actors shape the place, through use or for use, and the issue at hand. Most of the actors play in the three arenas, but it is essential to differentiate how their interests and power may change according to the issue, e.g., urban manufacturing or mixed-use. Looking deeper at urban manufacturing, Hill (2020) argues that there are three pathways to approach manufacturing in cities, namely People, Networks and Policy, Urban Integration, and Circularity and Technology. Hence, it is possible to say that the complexity of urban transformation increases when dealing with industrial sites and manufacturing activities due to the layers of arenas and pathways where decisions can be made. For instance, the strategy to build on ambassadors is related to the Urban Area Development arena, where space is shaped for use, but it requires decisions made within the three pathways of Hill (2020). First, in People, Networks and Policy, place-based financial levers are needed to provide incentives to large-scale manufacturers. Second, in Circularity and Technology, mixing complementary manufacturing and related services are essential to create resource and knowledge synergies. Finally, in Urban Integration, specific interventions are needed to create public faces that improve exposure to the neighborhood and acceptance from the community.

Furthermore, Borra & Urhahn (2020) discuss four actor roles that trigger development in ecosystems of work, namely directors, operators, conscious investors and pioneers. These leaders intend to look for ways to stimulate manufacturing and related work in the city. Nevertheless, after discussing with Borra, the conclusion is that actors could adopt a different role depending on the arena (BB, researcher of The Spontaneous City, 2021). Within the Urban Area Development, a developer can operate as a conscious investor to push forward the development, for example Amvest in Schieoevers Noord. However, this same actor can become an operator in the arena of Mixed-use Area to ensure the right dynamics with neighbors, manage the property and work as a curator for the buildings. Finally, they could become pioneers in Urban Manufacturing if they find an opportunity to develop a business model and innovate processes within the local business network.

Moreover, these arenas are constantly changing; thus, the need to foresee possible future scenarios. This is portrayed in the four scenarios, Economic Hotspot, Mix & Make, e-Cosystem and Local Leverage. Opportunities and challenges show that despite progress has been made in the redevelopment of Schieoevers Noord, it cannot be ignored that changes occur unexpectedly or strategies can be improved to be more effective. The past has taught lessons about how to be prepared for shifts in the economy, society or environment. For instance, emphasis has been done on the failed attempts to redevelop the area before because of private parties going bankrupt; this time, Covid-19 has impacted the local and global economy. Discussing with an expert on financialization of urban redevelopment, it was mentioned that participation cannot be used as a patch, while public funding is taken for granted in The Netherlands and there is a need to develop innovative financialization models (YC, researcher of TU Delft, 2021).

For example, innovative solutions can come from new players, local investment funds or supporting large corporations to transform their business models in the area. Nonetheless, these models require an understanding of the arenas to know how to manage actors according to their power and interest and how to direct the strategies effectively.

6.2. Conclusions

The problem has been presented in the Introduction where it is described that the lack of effective place-making strategies to transform industrial urban areas into mixed-use areas, and the limited knowledge of how manufacturers interact with other actors, have exposed the vulnerability to future challenges of these redevelopment processes. Based on this, the goal of the research is to identify directions of place-making strategies to overcome future challenges in the redevelopment of industrial urban areas into mixed-use area, through the interaction of actors in the case of Schieoevers Noord. This aims to shed light on the changing conditions of the redevelopment process of an industrial urban area, and reveal areas of attention in the interaction of actors to direct strategies effectively. In order to do so, preliminary objectives are set. First, to analyze the arenas in which actors interact in specific area conditions. Second, to identify possible future scenarios based on underlying forces of manufacturing and industrial urban areas. Third, to identify opportunities and challenges based on empirical analysis and possible future scenarios. These sub-objectives are connected to the following sub-questions which are answered before concluding with the main research question.

S.Q.1. Which are the arenas of actor interaction in Schieoevers Noord?

Arenas are places where actors from different networks interact to handle specific issues and common interests. These arenas involve decision-making environments in which actors take actions to progress towards a common goal. However, long-term developments within arenas are in constant change due to forces that influence the actors and area involved. Specifically for industrial urban areas in process of redevelopment into mixed-use areas, three arenas are encountered in relation to how space is being shaped and the common goals. First, the Urban Area Development arena in which actors interact to shape space for use through development and design decisions. Second, Mixed-use Area is an arena where space is shaped through use by mixed actors using, adapting, interacting and managing in daily occupation. Third, Urban Manufacturing is an arena where space is again shaped through use, but actors are mainly involved in the daily operation of business networks.

Regarding the case of Schieoevers Noord, stakeholders are involved at different scales and from different networks and sectors, namely Public Service, Knowledge, Community, Capital and Business. Public Service actors include Gemeente Delft and Province of South Holland. Knowledge actors include TU Delft, Innovation Quarter and Roots Beleidsadvies. Community actors are mainly Lijm & Cultuur and Scouting Delfland. Capital actors involve Amvest, Kondor Wessels and AM. Last, Business actors include BKS, Prysmian Group, Octatube and Flying Fish. These are not all of the actors but portray the wide range of actors involved in the case. Furthermore, their power and interest make some key players, in particular Amvest, Kondor Wessels, AM, Gemeente Delft, TU Delft, Prysmian Group, BKS among others. Other stakeholders are meant to be

kept satisfied or informed. However, actors can be involved in all of the three different arenas, in which the conditions change.

- First, in Urban Area Development there is a good relationship between local authorities, investors and developers, most land owners and knowledge institutions. Due to private land ownership, it is considered fundamental to create positive relationships since they can trigger development decisions. On the other hand, local and regional authorities are owners of public space and infrastructure, which is used as leverage over the reorganization and rezoning of the area. Besides, knowledge institutions are interested in developing the knowledge-intensive ecosystem, attracting interest to the area from other actors. Community members are concerned in developing co-creation and connectivity to surrounding areas, therefore, public space, meeting places and public participation are perceived as key factors by knowledge consultants. Last, businesses are interested in economic and spatial growth, requiring public support, commitment and stimulation to invest and continue developing. In response, local authorities and private parties refer to business actors as ambassadors and references to whom they can count on to attract new players and embed them in the ecosystem.

- Second, in Mixed-use Area benefit is perceived by local authorities, developers and users from overlapping uses with a framed but not fixed outcome. However, knowledge consultants suggest communication and a clear operations management are needed early to make necessary adjustments. Besides, local authorities facilitate discussion, interaction and involvement of the actors occupying the space. Moreover, long-term investment of private parties requires localized interaction with those stakeholders involved in high-environmental category activities. Hence, existing business activities require awareness. Existing activities, events and meeting places of the community are meant to be nourished while place-making events and spatial interventions are used to attract and integrate new users to the community dynamics. However, local authorities invest to support rents and prevent effects on businesses due to new living activities.

- Third, in Urban Manufacturing local authorities have close contact with businesses. However, the involvement of knowledge institutions is necessary to show commitment. Consultants identify the urge of double use and optimization of space, and resource management to create an environment with economic interaction. Investors and land owners make progress of operation awareness by discussing with large-scale businesses. Nonetheless, suggestions are made to these businesses to invest in digital operations and high-tech manufacturing. Other businesses, including high-tech manufacturers, are interested in space availability and affordability. Besides, the proximity to clients, knowledge development and human resources is key for manufacturers and businesses.

S.Q.2. What are the possible future scenarios for Schieoevers Noord?

The possible future scenarios for Schieoevers Noord are based on the relation between proximity and diversity and their impact over area conditions and decisions taken by actors. Through a process of scenario planning and overlapping with existing knowledge, the resulting scenarios are Economic Hotspot, Mix & Make, e-Cosystem and Local Leverage. These scenarios have different degrees of proximity and diversity, and they change how actors interact within the three arenas described before.

- First, Economic Hotspot is a scenario with low proximity and low diversity. Global strategies are implemented to boost local economy, resulting in economic growth and presence of large corporations. Consequently, business relies on keeping high productivity, global supply chains and intense use of automated infrastructure for storage and logistics. Hence, the area shifts away from the city, becoming autonomous and independent of local actors. While the area is adjacent to living areas, housing is scarce or non-existent and its accessibility remains low, depending on automated transportation or cable cars. Nonetheless, the area is increasingly attractive for fast growing startups, technology hubs, and private knowledge institutions, creating exclusive agreements with corporations.

- Second, Mix & Make is presented as a future of high proximity and high diversity. Local authorities gain power with zoning plans and environmental frameworks that allow them to regulate activities while integrating the area to the urban fabric of the city. Moreover, investments have stable returns and generate an increasing added value for Delft as a whole. In addition, an independent entity is formed by the neighbors and business community to acquire properties, gain financial leverage and adopt the management responsibilities of public space. Hence, the entity assumes the role of curator to connect actors, identify needs and invest in high quality public space for events and meeting places. Besides, a place-based fund is created to invest in new forms of mobility and innovative processes for lighter production.

- Third, e-Cosystem is a scenario based on low proximity and high diversity. The business association takes a step forward and makes a collaborative agreement with developers and investors to establish a decentralized network based on crowd-sourcing investment and curation of uses through big data. Consequently, local authorities and knowledge institutions invest in digital operations, virtual platforms and open-source systems to stimulate transparency and collaboration. Besides, collective funds are created with other industrial areas of the region, facilitating a regional competitive advantage.

- Last, Local Leverage is the result of high proximity and low diversity. New political parties shift their interests to local development, resulting in higher budgets and financial power for local authorities. Policies are implemented to promote the 15-minute city and special regulations to combine living and working activities. This leads to a decrease in international presence, both in business and knowledge institutions. Meanwhile, the local business association

gets public financialization and support to invest in properties and operations. Furthermore, mixed-use with low density is achieved successfully and bottom-up initiatives stimulate community building and local interaction. In addition, production is localized with proximity labels and new forms of small-scale manufacturing, while innovative solutions are implemented to create a smart grid and establish an energy symbiosis.

S.Q.3. What are the opportunities and challenges based on empirical findings and future scenarios for Schieoevers Noord?

The four scenarios describe diverse possible futures of the area within the arenas. Each scenario can exist by itself or within a combination of them, making the future highly complex. However, they reveal possible opportunities and challenges in the arenas which can be managed through effective strategies. In other words, the shifts of scenarios create the following reasons for action.

- Within the Urban Area Development arena, opportunities to be exploited concern having good relationships between development actors, in particular local authorities, developers, investors and land owners. Besides, business actors can be portrayed as ambassadors of the area, while there is potential to develop co-creation and connectivity with the community. Thus, creation of meeting places and public participation should continue being essential means in the redevelopment process. Regarding challenges, dependency on private land ownership can make the process too exposed to market shifts and economic downsides. On the other, reliance on public support for business development leads to vulnerability to political interests.

- In the arena of Mixed-use Area, opportunities are revealed to enhance communication and implement operation management in daily occupation. Besides, discussion, interaction and involvement of actors is key to mix living and working activities and develop awareness of existing businesses. Furthermore, barriers to overcome are the lack of considering some existing activities and meeting places, reliance on events and spatial interventions as sole place-making strategies and the threat of increasing rents for start-ups and small-scale manufacturers.

- Regarding Urban Manufacturing, opportunities can be taken on resource management and close contact with users through business management. Moreover, involving knowledge actors is a great opportunity to find possible solutions for investment in digital and high-tech operations. Besides, it is important to take advantage of related services and institutions for businesses to have proximity to clients, knowledge development and human talent. Nevertheless, challenges to consider are the reduced space availability and affordability. In addition, space is not being optimized, mostly by large-scale businesses. However, an awareness barrier between neighbors has to be overcome to understand business operations.

Having answered the sub-questions, the main question can be concluded, thus resulting in the final conclusion.

M.Q. How to direct place-making strategies to overcome future challenges in the redevelopment of industrial urban areas into mixed-use areas, through the interaction of actors in the case of Schieoevers Noord?

After answering the sub-questions, it is possible to conclude that interactions of actors in Schieoevers Noord occur within three arenas, namely Urban Area Development, Mixed-use Area and Urban Manufacturing. These arenas represent how stakeholders come together to discuss and make progress on specific issues and common interests within the whole redevelopment. However, the process of redevelopment of an industrial urban area into a mixed-use area presents challenges when future scenarios are explored and compared with empirical findings. The scenarios describe vivid plausible futures that influence the arenas, for instance power and interests shift within actors or area conditions adapt to new demands; hence the difficulty to direct place-making strategies effectively. However, given the opportunities and challenges revealed across the arenas, it is possible to recommend how to manage the stakeholders and direct the process with the specific actions described before and resumed in the following paragraphs:



Urban Area Development - Build on Ambassadors

Exploit opportunities by building positive relationships between local authorities, investors, land owners, knowledge actors and businesses. Portray businesses, in particular large-scale manufacturers, as ambassadors and reference actors on how to innovate operations and adapt to high-tech processes. To activate these actors, local authorities can provide incentives to develop spaces in their properties for the business association to allocate new related businesses and activities, with the goal of supporting the large-scale manufacturer in process innovation and economic growth. Meanwhile, the new businesses develop relations with existing users to find the best fit within the area. Developing working spaces with the active participation of large-scale manufacturers and the business association can stimulate interaction within the area, create links within the network, benefit their activities and strengthen their role as ambassadors.



Urban Area Development - Co-create to Connect

Establish sessions of co-creation to design and develop public space and infrastructure for connection, for instance meeting places, bridges and tunnels. Take advantage of high-skilled talent from knowledge institutions to explore innovative solutions, in particular through open design competitions. Besides, promote place-making events and workshops in existing venues with the existing community and knowledge actors to experiment with mobility and infrastructure while enhancing the interaction between different users. While the process could take longer than a conventional tender process, it can engage existing users, attract new actors and find innovative solutions that have not been explored, resulting in higher quality and acceptance.



Mixed-use Area - Develop Awareness

Promote awareness of existing activities, both through physical and digital means, to reach a larger audience and inform about how they contribute to the city and society. Organize and finance campaigns through the business association to communicate with the general public about what is produced and offered locally. Besides, collaboration is needed between local authorities, business association and knowledge actors to capture high-skilled talent, both local and international students from knowledge institutions to make use of the opportunities of diversity. Therefore, attract and involve people through (non)physical workshops, tours, or pop-up events in and outside the area using area-based funds



Mixed-use Area - Decentralize Curation

Decentralize decision-making power by sharing information and setting distance from political and market shifts. Take advantage of collective leverage through a decentralized system based on crowd-sourcing, big data, internet of things (IoT) and block-chain technology. Therefore, identification of needs, coordination, allocation of activities and decision-making can be done more transparently to protect the collective interests while keeping privacy standards. Implementation should start at a block scale with the collaboration of land owners, and then escalate to the whole area when the model gains acceptance.



Urban Manufacturing – Innovate Operations

Invest in digital operations and online virtual platforms to reach a larger audience, interact with various actors and manage complex processes. Local authorities must show commitment and disposal to collaborate so large-scale manufacturers are motivated to transition to innovative processes and high-tech manufacturing within a feasible policy framework. Moreover, knowledge actors are key support businesses and local authorities to transition towards virtual platforms for participation processes, business networking and operations, and resource and waste management across the area.



Urban Manufacturing - Optimize Space

Optimize space through transitional uses to activate the area and intensify available space. Explore double use of space through time to test new ideas, for instance managing the flow of stock of businesses to operate temporary leisure or manufacturing activities. Implement trials and experiments that may reveal potential solutions for future vertical mixing and long-term business models. Local authorities could stimulate large-scale manufacturers through place-based financial levers to make available space in time for production test runs or events. Therefore, these trials can be used to find feasible solutions that provide financial benefits for the land owners, space availability for start-ups, socio-economic interaction between users and a long-term transition to mixed-use and space optimization.

To overcome future challenges in the redevelopment of industrial urban areas into mixed-use areas, place-making strategies should be implemented in a timely manner, within the relevant arena and involving the respective actors. Not every strategy can be implemented simultaneously or immediately, thus directing a strategy can facilitate unlocking new opportunities for further strategies. In an industrial urban area, it is essential to start with strategies that activate businesses across all industries and scales to exploit positive interests and prevent place-breakers, in particular those actors that have higher leverage due to land ownership. These strategies, like Build on Ambassadors, Develop Awareness or Innovate Operations, start with policy changes, capacity building and financial incentives to stimulate immediate investments through physical and non-physical means. On the other hand, strategies like Co-create to Connect, Decentralize Curation or Optimize Space can take more time or be implemented later. However, these strategies facilitate community engagement and socio-economic interaction throughout the process.

Place-making of industrial urban areas is definitely a process that takes a long-term commitment and an acknowledgement of business operations, in particular manufacturing activities. Therefore, overcoming shifts of possible future scenarios can be done through the proper management of actors and their interests. In other words, place-making strategies differ in arenas where space is shaped for use (e.g., Urban Area Development) than when it is shaped through use (e.g., Mixed-use Area and Urban Manufacturing). Besides, actions taken in the daily occupation between living and working are different than the ones within the business network; thus, strategies should fit the purpose. Nonetheless, the implementation of strategies over all of the arenas can enhance the effectiveness to overcome future challenges in the redevelopment of these areas.

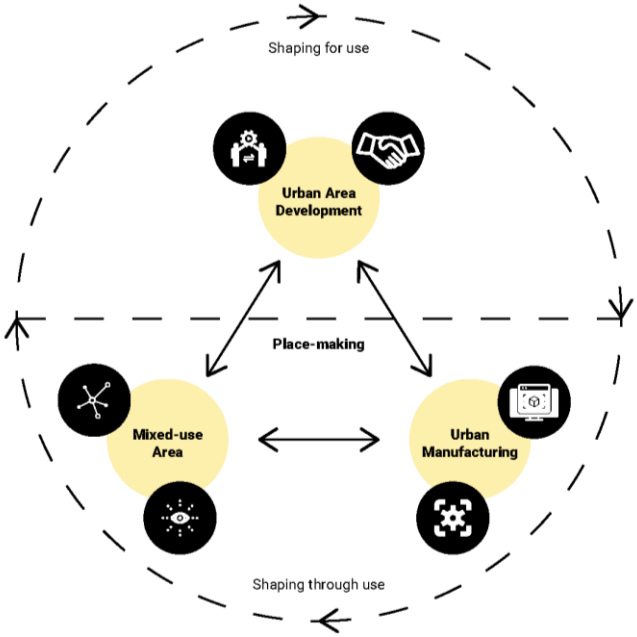

Figure 40 Place-making strategies in arenas (own image)

6.3. Limitations

Following this research has several limitations and implications on the approach, the context, the time, and language. First, the approach relies heavily on personal experience and interpersonal communication. In other words, it is not a straightforward approach to finding answers because it requires an inductive approach to understand how people perceive the problem. Besides, the in-depth case study has the limitation of low transferability to other cases and other contexts, especially to other countries with different governance and institutional environments. Regarding context, the Covid-19 pandemic influences the approach to the case, since it creates a barrier for physical interaction with the actors involved and the case area. Moreover, the stress, anxiety, and other problems caused by the pandemic may affect how people feel about the research, the current priorities, and their availability for discussing the topic.

Furthermore, the time constraint is key in achieving the set objectives and main goal. The research was expected to follow a plan but the explorative approach, iterations and design methods inevitably steered to process to other directions, which revealed new insights. Although it is part of the experience, decisions had to be taken to finalize the research within the timeframe. For example, a focus group or a comparative analysis with other case had to be discarded. On the other hand, the language sets a communication barrier for the research since most of the documentation and participation process is in Dutch.

Finally, it is essential to understand that the research aims to follow a multidisciplinary approach but it may lack support from other professionals. Therefore, the research does not intend to be exhaustive nor an ultimate solution for the problem, but a diagnosis of which directions to follow next.

6.4. Recommendations

Several aspects are relevant and compelling for further research. Findings have revealed the dependency on private land ownership and public support. Nevertheless, the rise of decentralized networks in economy, technology and social platforms due to the Industry 4.0 have opened the way to explore business models on decentralized ownership and financialization. As mentioned before, public funding should not be taken for granted and innovative business models should be explored to implement the given strategies or other actions within area development in industrial urban areas. Furthermore, given the rise of the virtual world, the concept of proximity to other people, e.g., neighbors, clients, knowledge actors, among others, should be touched upon to understand the qualities of proximity in the physical and nonphysical dimensions. Last, Covid-19 has exposed several challenges for participation and close contact between stakeholders, for instance the increase of stress and uncertainty, and the ineffectiveness of online participation meetings. While participation processes have good intentions, most of the time they are followed as informing sessions rather than authentic participation and delegation of decision-making. Covid-19 has brought radical changes in the way to interact with others, though it has sped up new technologies and virtual tools that can facilitate better participation and interaction in the process of design and development. Therefore, efforts should be made in research and practice to find possible implementations of new virtual participation tools and collaborative platforms for redevelopment processes.

Reflection

7. Reflection

Looking back makes me aware of the decisions I have taken for my research. First, I decided to follow the research through the studio City of the Future to take advantage of a multidisciplinary environment. Despite being a student of Management in the Built Environment, I am and will continue to be a designer with management knowledge. The two disciplines are intrinsically connected, but I believe there is a large gap and blind spots in each of the professions. Therefore, I have decided to explore the gaps to improve as a professional and contribute to knowledge. I have to admit, I have felt lost for moments throughout the process. Nonetheless, the topic I have chosen drives me with ambition. At first glance, I thought some ideas had no strong connection but having an explorative approach and a divergent mindset has allowed me to find relations and links of knowledge. Besides, working in the studio City of the Future and the support of the mentors have facilitated me the flexibility and exposure to other disciplines that I needed, for instance urban design.

As mentioned throughout the research, I have taken the research as a process of making. What I mean is that it is not a straightforward process, but an iterative flow similar to design, or even to craftsmanship. This has allowed me to make smooth progress, overcome barriers and understand that the research requires time and several iterations to deal with wicked problems. Nonetheless, it is a conflicting approach because answers are not found easily nor explicit, even less within a qualitative research. Besides, the City of the Future inspired me to work with scenario planning, a technique which I hardly knew before studying management. This adds a new layer of complexity but allows me to explore possibilities as a designer. However, as a designer I encountered the issue of trying to be problem-solver, but the research approach facilitates the perspective of a problem-finder. Consequently, the problem can be understood in depth without constraints before approaching to a solution. In other words, process becomes more influential than final product. Hence, it should be noted that the final product is case specific and may have low transferability to other situated conditions, though the process can be taken as a reference and inspiration for other cases.

Furthermore, it has not being easy to meet theory with practice; several gaps and dilemmas are revealed. While theory explains optimal process of development, place-making and design, practice presents a contrasting reality. People think, say or act without being conscious of their actions, which can contradict themselves. For instance, people value production and manufacturing, though “not in their backyard”. In other words, good intentions are made to integrate different uses, but when the moment comes, not every production activity is seen as positive to have right next to where one lives. Besides, a dilemma rises when society and authorities establish standards of correctness on how it should be, but ends up conflicting with how it actually happens in practice

Moreover, the current situation of Covid-19 has presented many challenges for the process. First, the situation has limited the physical approach to the area and the people involved in the case. Second, it has hindered the physical collaboration and social interaction in the studio with mentors and colleagues, which I consider highly valuable. Finally, the situation creates a sense of anxiety and uncertainty that affected my performance at some points in the process. Nevertheless, I consider that I have been able to make progress by channeling those feelings into the research. In other words, I tried to understand the implications of the situation over the future of the people and the city.

References

References

Adams, D., & Tiesdell, S. (2012). *Shaping Places: Urban Planning, Design and Development*. Taylor & Francis. https://books.google.nl/books?hl=en&lr=&id=ed_qLpQ_ATUC&oi=fnd&pg=PP2&dq=shaping+places&ots=8ixFotQV1x&sig=CMX1PHbd2NxmAtTaDTqXdsaaSOQ&redir_esc=y#v=onepage&q=shaping places&f=false

Agrawal, M., Eloot, K., Mancini, M., & Patel, A. (2020). Industry 4.0: Reimagining manufacturing operations after COVID-19. *McKinsey & Company*, *July*. https://www.mckinsey.com/business-functions/operations/our-insights/industry-40-reimagining-manufacturing-operations-after-covid-19

Almeida, R., & Fernandes, A. M. (2013). Explaining local manufacturing growth in Chile: The advantages of sectoral diversity. *Applied Economics*, *45*(16), 2201–2213. https://doi.org/10.1080/00036846.2012.659344

Berkers, M. (2020). *The City of the Future - Ten Design Strategies for Five Locations*. BNA Onderzoek.

Blackwell, E., Gambell, T., Marya, V., & Schmitz, C. (2017). The great re-make : Manufacturing for modern times. *McKinsey & Company*, *June*, 134. https://www.mckinsey.com/business-functions/operations/our-insights/the-great-remake-manufacturing-for-modern-times

Borra, B., & Urhahn, G. (2020). *Ecosystemen van Werk in de Stad*. https://www.hogeschoolrotterdam.nl/globalassets/standaard-teaser-carroussel/onderzoek/lectoren/fotos-projecten-dhs/2020-book-evw-spreads-gecomprimeerd.pdf

Brülhart, M., & Mathys, N. A. (2008). Sectoral agglomeration economies in a panel of European regions. *Regional Science and Urban Economics*, *38*(4), 348–362. https://doi.org/10.1016/j.regsciurbeco.2008.03.003

Bryman, A. (2012). *Social Research Methods* (4th ed.). Oxford University Press.

Cadena, A., Remes, J., Manyika, J., Dobbs, R., Roxburgh, C., Elstrodt, H.-P., Chaia, A., & Restrepo, A. (2011). Building globally competitive cities: The key to Latin American growth. *McKinsey & Company*, *August*.

Campana, G., & Cimatti, B. (2013). The slow factory: a new paradigm for manufacturing. *The 11th Global Conference on Sustainable Manufacturing*, 298–302.

Carmona, M. (2014). The Place-shaping Continuum: A Theory of Urban Design Process. In *Journal of Urban Design*. Taylor & Francis. https://doi.org/10.1080/13574809.2013.854695

Carpi, R., Littmann, A., & Schmitz, C. (2019). The future of manufacturing: Your people. *McKinsey & Company*. https://doi.org/10.1201/9781439828328.ch1

Chen, Y., Daamen, T. A., Heurkens, E. W. T. M., & Verheul, W. J. (2019). Interdisciplinary and experiential learning in urban development management education. *International Journal of Technology and Design Education*, *30*(5), 919–936. https://doi.org/10.1007/s10798-019-09541-5

Collaton, E., & Bartsch, C. (1996). Industrial Site Reuse and Urban Redevelopment—An Overview. *Cityscape*, *2*(3), 17–61.

Culot, G., Orzes, G., Sartor, M., & Nassimbeni, G. (2020). The future of manufacturing: A Delphi-based scenario analysis on Industry 4.0. *Technological Forecasting and Social Change*, *157*(December 2019), 120092. https://doi.org/10.1016/j.techfore.2020.120092

Daamen, T. (2010). *Strategy as Force. Towards Effective Strategies for Urban Development Projects: The Case of Rotterdam CityPorts*.

Daamen, T., & Franzen, A. (2020, September 24). *Duurzame gebieden door de combinatie van bestaand en nieuw – Gebiedsontwikkeling.nu*. https://www.gebiedsontwikkeling.nu/artikelen/duurzame-gebieden-door-de-combinatie-van-bestaand-en-nieuw/

Daamen, T., & van der Linden, H. (2020). In Search of the Added Value of Research by Design in Area Development. In *The City of the Future* (pp. 20–24). BNA Onderzoek.

Daamen, T., & Verheul, W. J. (2018). *Gebiedsontwikkeling: lessen van elders voor de Schieoevers van morgen*. http://www.topdelftdesign.nl/wp-content/uploads/2018/02/2018-03-28-Schieoevers-TOP-Delft-Daamen-en-Verheul-2018.pdf

Davis, J., & Renski, H. (2020). Do Industrial Preservation Policies Protect and Promote Urban Industrial Activity?: Examining the Impact of New York City's Industrial Business Zone Program. *Journal of the American Planning Association*, *86*(4), 431–442. https://doi.org/10.1080/01944363.2020.1753563

Dewulf, G. P. R. M., den Heijer, A. C., de Puy, L., & van der Schaaf, P. (1999). Het managen van vastgoed binnen een publieke organisatie. In *Journal of Chemical Information and Modeling* (Vol. 53, Issue 9). Delft University Press.

Gemeente Delft. (n.d.). *Schieoevers Ontwikkelplan*. Retrieved January 17, 2021, from https://www.delft.nl/wonen/bouwen/bouwprojecten-de-stad/schieoevers/ontwikkelplan

Gemeente Delft, & Broekman, M. (2019a). *Schieoevers Noord Delft: Ontwikkelplan*.

Gemeente Delft, & Broekman, M. (2019b). *Schieoevers Noord Delft*. https://www.delft.nl/wonen/bouwen/bouwprojecten-de-stad/schieoevers/ontwikkelplan

Gemeente Delft, & Kuiper Compagnons. (2018). *Delft 2040 Ruimte voor keuzes*.

Goffman, E. (2020). In the wake of COVID-19, is glocalization our sustainability

future? *Sustainability: Science, Practice, and Policy*, *16*(1), 48–52. https://doi.org/10.1080/15487733.2020.1765678

Hatuka, T., & Ben-Joseph, E. (2017). Industrial urbanism: Typologies, concepts and prospects. *Built Environment*, *43*(1), 10–24. https://doi.org/10.2148/benv.63.3.10

Hatuka, T., Ben-Joseph, E., & Peterson, S. M. (2017). Facing forward: Trends and Challenges in the development of industry in cities. *Built Environment*, *43*(1), 145–155. https://doi.org/10.2148/benv.63.3.145

Heurkens, E., Daamen, T., & Den Heijer, A. (2015). City tour Delft: The making of a knowledge city. *Disp*, *51*(2), 6–15. https://doi.org/10.1080/02513625.2015.1064608

Hill, A. V. (2020). *Foundries of the Future: a Guide to 21st Century Cities of Making* (A. V Hill (ed.)). TU Delft Open. https://doi.org/10.4121 uuid:8bcd1748-3c04-4c2f-96cd-e763fe3b5b63

Hoppenbrouwer, E., & Louw, E. (2005). Mixed-use development: Theory and practice in Amsterdam's Eastern Docklands. *European Planning Studies*, *13*(7), 967–983. https://doi.org/10.1080/09654310500242048

Hospers, G. J. (2017). People, Place and Partnership: Exploring Strategies to Revitalise Town Centres. *European Spatial Research and Policy*, *24*(1), 65–79. https://doi.org/10.1515/esrp-2017-0004

Hutton, T. A. (2006). Spatiality, built form, and creative industry development in the inner city. *Environment and Planning A*, *38*(10), 1819–1841. https://doi.org/10.1068/a37285

Lester, T. W., Kaza, N., & Kirk, S. (2013). Making room for manufacturing: Understanding industrial land conversion in cities. *Journal of the American Planning Association*, *79*(4), 295–313. https://doi.org/10.1080/01944363.2014.915369

Lindgren, M., & Bandhold, H. (2009a). Scenario Planning in Practice. In *Scenario Planning The link between future and strategy* (pp. 49–117). Palgrave Macmillan. https://doi.org/https://doi.org/10.1057/9780230233584_4

Lindgren, M., & Bandhold, M. (2009b). Scenario Planning : An Inroductory Overview. In *Scenario Planning The link between future and strategy* (pp. 22–48). Palgrave Macmillan. https://doi.org/https://doi.org/10.1057/9780230233584_3

Markforged. (2020). *The Additive Movement Has Arrived*.

Martin, D. G. (2003). "Place-framing" as place-making: Constituting a neighborhood for organizing and activism. *Annals of the Association of American Geographers*, *93*(3), 730–750. https://doi.org/10.1111/1467-8306.9303011

Metropoolregio Rotterdam Den Haag. (n.d.). *Transformatie Schieoevers in Delft: multifunctioneel is de toekomst!* Retrieved January 17, 2021, from

https://mrdh.nl/transformatie-schieoevers-delft-multifunctioneel-toekomst

Moos, M., Vinodrai, T., Revington, N., & Seasons, M. (2018). Planning for Mixed Use: Affordable for Whom? *Journal of the American Planning Association*, *84*(1), 7–20. https://doi.org/10.1080/01944363.2017.1406315

Muzhi, Z. (2020, May 18). *What's the future for manufacturing amid COVID-19 pandemic? | english.scio.gov.cn*. http://english.scio.gov.cn/in-depth/2020-05/18/content_76056715.htm

Roots Beleidsadvies. (2017). *Economic Vision Schieoevers 2030*.

Rowley, A. (1996). Mixed-use Development: Ambiguous concept, simplistic analysis and wishful thinking? *Planning Practice & Research*, *11*(1), 85–98. https://doi.org/10.1080/02697459650036477

Scale Cities. (n.d.). *Manifattura Milano. Promotion of Manufacturing in the City*. Retrieved January 17, 2021, from https://scalecities.com/cases/manifattura-milano/

Schieoevers Noord. (n.d.). *Bijeenkomsten*. Retrieved January 17, 2021, from https://schieoeversnoord.nl/bijeenkomsten

Sennett, R. (2008). *The Craftsman*.

Snellen, D., & Hamers, D. (2020). *Rehearsing the future: Scenarios for urban development, infrastructure and mobility in the Netherlands in 2049*. https://www.pbl.nl/en/publications/rehearsing-the-future

Susskind, L. (2013). Confessions of a Pracademic: Searching for a Virtuous Cycle of Theory Building, Teaching, and Action Research. *Negotiation Journal*, *29*(2), 225–237. https://doi.org/10.1111/nejo.12020

The Economist. (2021). Message in a bottleneck. *Leaders*. https://www.economist.com/leaders/2021/03/31/global-supply-chains-are-still-a-source-of-strength-not-weakness

Van Bueren, E., Daamen, T., Chen, Y., Franzen, A., Hobma, F., & Verheul, W. J. (2016). Urban Development Management : Past , Present and Future. *Dear Is Durable: Liber Amicorum for Hans de Jonge*, *September*, 281–289.

van den Berghe, K., Dabrowski, M., Ersoy, A., Wandl, A., & van Bueren, E. (2019). *The Circular Economy : a Re-Emerging Industry? [working paper]*. 1–15. https://osf.io/preprints/socarxiv/tgvzj/

Verheul, W. J. (2015). Plaatsgebonden identiteit: het anker voor stedelijke ontwikkeling. *De Stad Kennen, de Stad Maken*, 35–49.

Wu, F. (2000). The global and local dimensions of place-making: Remaking Shanghai as a world city. *Urban Studies*, *37*(8), 1359–1377. https://doi.org/10.1080/00420980020080161

Appendices

1. Appendix A – Interviews and meetings

Stakeholders

Codename	Organization	Sector	Expertise	Interview	Meeting
GB	Roots Beleidsadvies	Knowledge	Economic Policy	08-01-21	
MM	Gemeente Delft	Public Service	Business Management	17-02-21	
DS	Gemeente Delft	Public Service	Area Management	19-02-21	
OW	Amvest	Capital	Investment and Development	31-03-21	20-01-21 27-01-21
MP	Community	Community	N.D.		13-01-21 03-02-21
HL	Kondor Wessels	Capital	Investment and Development	19-03-21	
PM	SPC	Capital	Investment and Development		14-01-21
JV	Kondor Wessels	Capital	Investment and Development		13-01-21
KK	ZUS	Knowledge	Urban Design		27-01-21
SB	Gemeente Delft	Public Service	Policy		09-02-21 13-02-21
RH	AM	Capital	Investment and Development		11-02-21
FF	Flying Fish	Business	High-tech manufacturing	17-03-21	
HA	Amvest	Capital	Investment and Development		11-02-21
LC	Lijm & Cultuur	Community	Entertainment and events		28-01-21
DP	De Urbanisten	Knowledge	Urban Design		14-01-21
FZ	BURA	Knowledge	Urban Design		10-02-21
ML	Mei Architects	Knowledge	Architecture		27-01-21
MB	Hely	Knowledge	Mobility		02-02-21
NE	BKS	Business	Business networks		13-01-21
KS	Gemeente Delft	Public Service	Policy		11-02-21
SD	Scouting Delftland	Community	Culture		28-01-21
RD	Fakton	Capital	Investment and Development		20-01-21
NV	Cable District	Community	Place-making		28-01-21

Experts

Codename	Organization	Sector	Expertise	Interview	Meeting
PB	TU Delft	Knowledge	Housing		13-01-21
WV	Gemeente Rotterdam	Public Service	Urban Planning		20-01-21
PR	SK Movares	Knowledge	Architecture		03-02-21
HK	Stipo	Knowledge	Urban Design		27-01-21
MR	Independent	Capital	Investment and Development		20-02-21
YC	TU Delft	Knowledge	Urban Development	11-02-21	
BH	TU Delft	Knowledge	Urban Manufacturing	11-03-21	
BB	The Spontaneous City	Knowledge	Urban Development	26-02-21	
AB	Van Berlo	Knowledge	Design Consultancy		20-01-21

2. Appendix B – Protocol Knowledge actors

Dear _____,

The South Holland region has been trying to overcome living and environmental challenges. Though, Delft has a long-term vision based on its own challenges and opportunities. The city has the vision of becoming the high-tech capital of the Netherlands through an innovative manufacturing industry, but it is already complicated enough to overcome the other challenges like the housing and nitrogen crisis. Given the scarcity of land and the existing conditions, industrial urban areas, like Schieoevers Noord, have become attractive for redevelopment into mixed-use areas. However, redeveloping this type of areas come with a pressure on manufacturing activities, conflicts of interests and a complex interaction of actors. This can complicate the implementation of place-making strategies. For this reason, I am following an explorative research on ***Place-making with the Makers*** with the following main question:

How to direct place-making strategies to overcome future challenges in the redevelopment of industrial urban areas into mixed-use areas, through the interaction of actors in the case of Schieoevers Noord?

I would like to have a conversation with you without the need to answer this specific question or following a strict protocol, but some of the ideas that I would like to discuss with you are:

- Role and expertise
- Knowledge on the case of Schieoevers Noord
- Actors involved and their role in the redevelopment process
- Short-term and long-term policy challenges of the area
- How to assess the process of redevelopment, e.g., economic or social factors

Best regards,

Carlos Lüchau

3. Appendix C – Protocol Public Service actors

Dear _____,

The South Holland region has been trying to overcome living and environmental challenges. Though, Delft has a long-term vision based on its own challenges and opportunities. The city has the vision of becoming the high-tech capital of the Netherlands through an innovative manufacturing industry, but it is already complicated enough to overcome the other challenges like the housing and nitrogen crisis. Given the scarcity of land and the existing conditions, industrial urban areas, like Schieoevers Noord, have become attractive for redevelopment into mixed-use areas. However, redeveloping this type of areas come with a pressure on manufacturing activities, conflicts of interests and a complex interaction of actors. This can complicate the implementation of place-making strategies. For this reason, I am following an explorative research on ***Place-making with the Makers*** with the following main question:

How to direct place-making strategies to overcome future challenges in the redevelopment of industrial urban areas into mixed-use areas, through the interaction of actors in the case of Schieoevers Noord?

I would like to have a conversation with you without the need to answer this specific question or following a strict protocol, but some of the ideas that I would like to discuss with you are:

- Role and expertise
- Knowledge on the case of Schieoevers Noord
- Collaborative agreement of Schieoevers Noord
- Actors involved and their role in the redevelopment process
- Short-term and long-term policy challenges of the area
- Policy and financial tools of the Gemeente Delft
- Challenges and opportunities during participation process

Best regards,

Carlos Lüchau

4. Appendix D – Protocol Capital actors

Dear _____,

The South Holland region has been trying to overcome living and environmental challenges. Though, Delft has a long-term vision based on its own challenges and opportunities. The city has the vision of becoming the high-tech capital of the Netherlands through an innovative manufacturing industry, but it is already complicated enough to overcome the other challenges like the housing and nitrogen crisis. Given the scarcity of land and the existing conditions, industrial urban areas, like Schieoevers Noord, have become attractive for redevelopment into mixed-use areas. However, redeveloping this type of areas come with a pressure on manufacturing activities, conflicts of interests and a complex interaction of actors. This can complicate the implementation of place-making strategies. For this reason, I am following an explorative research on ***Place-making with the Makers*** with the following main question:

How to direct place-making strategies to overcome future challenges in the redevelopment of industrial urban areas into mixed-use areas, through the interaction of actors in the case of Schieoevers Noord?

I would like to have a conversation with you without the need to answer this specific question or following a strict protocol, but some of the ideas that I would like to discuss with you are:

- Role and expertise
- Knowledge on the case of Schieoevers Noord
- Collaborative agreement of Schieoevers Noord
- Experience of the company in similar cases
- Short-term and long-term policy challenges of the area
- Management and finance tools for tenants
- Challenges and opportunities during participation process

Best regards,

Carlos Lüchau

5. Appendix E – Protocol Business actors

Dear _____,

The South Holland region has been trying to overcome living and environmental challenges. Though, Delft has a long-term vision based on its own challenges and opportunities. The city has the vision of becoming the high-tech capital of the Netherlands through an innovative manufacturing industry, but it is already complicated enough to overcome the other challenges like the housing and nitrogen crisis. Given the scarcity of land and the existing conditions, industrial urban areas, like Schieoevers Noord, have become attractive for redevelopment into mixed-use areas. However, redeveloping this type of areas come with a pressure on manufacturing activities, conflicts of interests and a complex interaction of actors. This can complicate the implementation of place-making strategies. For this reason, I am following an explorative research on ***Place-making with the Makers*** with the following main question:

How to direct place-making strategies to overcome future challenges in the redevelopment of industrial urban areas into mixed-use areas, through the interaction of actors in the case of Schieoevers Noord?

I would like to have a conversation with you without the need to answer this specific question or following a strict protocol, but some of the ideas that I would like to discuss with you are:

- Role and expertise
- Activities, clients, suppliers and resources of the business
- Schieoevers Noord as a place for business operations
- Impact of the redevelopment process

Best regards,

Carlos Lüchau