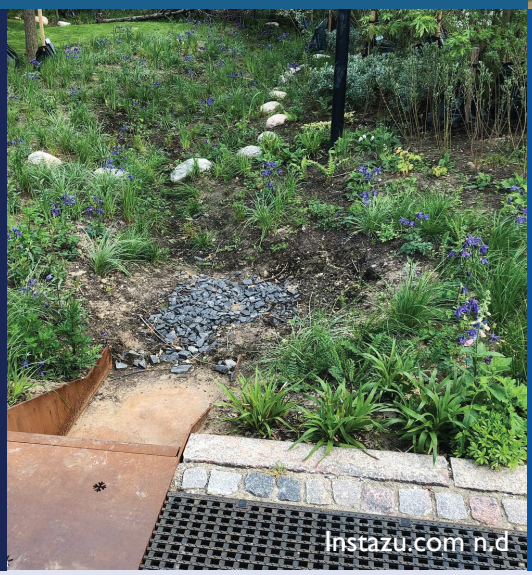
København Kommune, 2012

The 'Good' Cloudburst Management Solution

The dynamics between three perspectives:
Water Management, Finances and Urban Space.

CKT, 2018



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STUDENT REPORT

The 'Good' Cloudburst Management Solution

The dynamics between three perspectives: Water Management, Finances and Urban Space

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Abstract

Climate change adaptation is an imperative and institutional challenge that cities need to act upon. The new paradigm of climate adaptation emphasizes the creation of blue-green and sustainable solutions on the surface, which presents possibilities for synergies between cloudburst management solutions and the creation of green urban spaces. However, this requires institutions to evolve beyond the rational approach that previously characterized the (re)development of water management and urban spaces, to encompass a larger variety of desires. This is especially due to the integration of the previously separated rainwater system into the urban landscape, which inevitably blurs preceding administrative and infrastructural boundaries.

In Copenhagen, high ambitions are stated in the visions of the Copenhagen Climate Adaptation Plan. Nonetheless, political prioritizations and limited urban space funds strongly influence the degree to which these ambitions can be materialized. The case of Strandboulevarden is the first project to make a blue-green transformation in a distinct cultural historical urban space where no funds have been allowed for spatial improvements. It is considered a 'minimum project' constituting a new type of landscape in the city, where aesthetics and architectural design is cut all the way to the bone due to the prevalence of the technical and financial bindings.

Being the first 'minimum project' represents an opportunity to develop practices for how the complexities inherent to such projects are to be dealt with. This implies unveiling what influences action, how the 'good' solution in a 'minimum' project is defined, and how practitioners act through their everyday work towards defining the 'good' solution. Thus, this thesis seeks to answer the following research question:

"***Using the case of Strandboulevarden, how can practitioners - conducting cloudburst management projects that do not have any funds allocated for urban space development - navigate towards a solution, which contributes to the creation, or at least the maintenance, of the 'good' city?"***

To answer this problem formulation, an in-depth case study of the contemporary process of the Strandboulevarden project is chosen. The statements comprising this thesis rely on and are abstracted from qualitative empirical data gathered throughout the Spring of 2019. The data consists of semi-structured interviews, document analysis and participant observations.

Conclusively, this thesis explores how, despite financial restrictions which result in a strong hydraulic logic, the Strandboulevarden project is also subject to the conditions of planning in the public space. The report highlights that there are conditions which represent opportunities to shape and frame the design beyond the purview of the water logic. It is demonstrated that in order to do this however, there is a need to actively integrate these conditions and translate their implications so they can represent an opportunity for the practitioners involved to change their practices in future projects with similar conditions.

Resumé in Danish

Klimatilpasning er presserende og en institutionel udfordring, som byer skal reagere på. Det nye paradigme for klimatilpasning lægger vægt på skabelsen af blå-grønne og bæredygtige overfladeløsninger, hvilket giver muligheder for synergier mellem skybrudssikringsløsninger og skabelsen af grønne byrum. Dette kræver dog, at institutioner udvikler sig ud over den rationelle tilgang, som tidligere har karakteriseret udviklingen af vandhåndtering og byrum, for at omfatte et større udvalg af ønsker. Dette skyldes især integrationen af de tidligere adskilte regnvandsanlæg i bylandskabet, hvilket uundgåeligt slører administrative og infrastrukturelle grænser.
Københavns Kommunes Klimatilpasningsplan sætter høje ambitioner. Ikke desto mindre påvirker politiske prioriteringer og begrænsede byrumsmidler stærkt til hvilken grad disse ambitioner kan realiseres. Strandboulevarden projektet er det første projekt, hvor der skal laves en blå-grøn transformation i et særskilt kulturhistorisktbyrum, hvor der ikke er blevet tildelt midler til rumlige forbedringer. Det betragtes derfor som et 'minimumsprojekt', hvilket udgør en ny type landskab i byen, hvor æstetik og arkitektonisk design er skåret helt til benet på grund af de tekniske og finansielle bindinger. Det at Strandboulevarden er det første 'minimumsprojekt' udgør en mulighed for at udvikle en praksis for, hvordan kompleksiteten i sådanne projekter skal håndteres i fremadrettede projekter. Dette indebærer at afsløre, hvad der påvirker handling, hvordan den 'gode' løsning i et 'minimums' projekt er defineret, og hvordan praktikere, gennem deres daglige arbejde er med at definere den 'gode' løsning. Således søger dette speciale at besvare følgende problemformulering:

"Hvordan kan praktikere - der udfører skybrudsprojekter uden tildelte byrumsmidler - arbejde imod en løsning, der bidrager til oprettelsen, eller i det mindste vedligeholdelsen, af den "gode" by?"

For at besvare denne problemformulering, vælges et dybdegående casestudie af den nuværende proces i Strandboulevarden-projektet. De opgørelser som er nævnt i dette speciale er baseret på, og er abstraheret fra, kvalitativ empirisk data indsamlet i løbet af foråret 2019. Dataen består af semistrukturerede interviews, dokumentanalyser og deltagerobservationer.

Konkluderende undersøger dette speciale, hvordan Strandboulevarden-projektet - på trods af økonomiske restriktioner der har resulteret i en stærk hydraulisk logik - også er underlagt betingelserne for planlægning i det offentlige rum. Rapporten fremhæver, at der er forhold, som repræsenterer muligheder for at forme og ramme designet væk fra, eller ud over, de vandrelaterede formål. Det er påvist, at for at kunne gøre dette, er der behov for aktivt at integrere disse forhold og oversætte deres konsekvenser, så de kan repræsentere en mulighed for de involverede praktikere til at ændre deres praksis i fremtidige projekter med lignende forhold.

Preface and Acknowledgements

This Master's thesis was written in the fourth semester by three students from the Sustainable Cities Master program, at Aalborg University, Copenhagen. The report was written between the 2nd of February 2019 and the 7th of June 2019, weighted 30 ECTS points.

This report is the culmination of the engineering programme Sustainable Cities at Aalborg University Copenhagen. The education is concerned with developing holistic solutions for sustainability issues in a planning context. The research group seeks to address a contemporary sustainability challenge in close connection to the field. More specifically, the scope of research is concerned with a cloudburst management project in Copenhagen municipality, i.e. the Strandboulevarden project.

We want to express our greatest appreciation to all the persons interviewed for this thesis, and a special thanks to Center For Climate adaptation in Copenhagen for allowing us to follow the project of Strandboulevarden at close hand, and thanks to the practitioners from BOGL and Orbicon to share their knowledge and perspectives with us. They have all indeed been very helpful and accommodating through the provision of guidance, materials and interviews. Moreover, we would like to express our greatest appreciation to our thesis supervisor Maj-Britt Quitzau for her extreme dedication to supporting us as well as her incredible professional guidance, encouragement and constructive suggestions during the development of this research work.

Continued good readings,
Morten Holm Gylling, Ronja Helleshøj Sørensen and Sebastian Kolby Knudsen

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Terminology

Danish term	English translation
Takstmidler	Utility funds
Byrumsmidler (officially known as skattemidler)	Urban Space funds (tax funds)
Medfinansieringsbekendsgørsel	Co-finance Note
Forsyningssekretariat	Utility Secretariat
Center for Klimatilpasning (CKT)	Department for Climate Adaptation - referred to as CKT
Teknik og Miljøforvaltning (TMF)	Technical and Environmental Administration
Byliv	Urban life
Skybrudsplan	Cloudburst Management Plan
Program	Program
Rammeaftale	Framework Agreement
Klima og investeringsredegørelsen	Climate Change Adaptation and Investment Statement
Udbudsprocess	Procurement Process
Anlægsmåltal (also referred to as anlægsloft)	Construction target (construction limit)
Skitseforslag	Draft proposal
Rensebrønde	Purification well
Forsinkelsesbassin	Retention basin
Rensebassin	Purification basin
Filtermuld	Mulch filter
Kotering	Terrain elevation
Lokalrådet Østerbro	Local Council Østerbro
Lokaludvalg Østerbro	Local Committee Østerbro
Hydraulik notat	Hydraulic Note
Vand og VVM	Water and Environmental Impact Assessment (Water and EIA)
Skyrbrudsgren	Cloudburst branch
Vandopland	Water catchment area

1. Introduction

The combination of urban areas and sustainability has gained increased attention over the last few decades. This is primarily the result of increased urbanization and the adverse effects of climate change. The majority of people in the world currently live in cities and urban areas, with over 70 per cent of the global population expected to live in urban areas by 2050 (McCormick et al., 2013). According to the Intergovernmental Panel on Climate Change (IPCC) Special Report on global warming (Allen et al., 2018), human-induced global warming is likely to reach 1.5°C between 2030 and 2052 if drastic actions are not taken immediately (Masson-Delmotte et al., 2018). Especially, the combination of increased urbanization and major climate changes are applying massive pressure on cities' infrastructures. Hence, radical changes in planning and the governing of cities are necessary, with reconfiguration and adaptation of urban infrastructures being crucial to sustainable development.

In Denmark, the consequences of climate change are, in particular, attributed to changing precipitation patterns, including more intense rainfalls and storms, sea level rise, but also rising temperatures and periods of drought (Danmarks Meteorologiske Institut, 2014; Lund et al., 2012). These tendencies apply further pressure on existing urban infrastructures, straining their ability to fulfil their function by generating occasional capacity deficits (Malmö Stad, 2008; Grøndahl and Poulsen, 2014). An example thereof is the July 2nd 2011 cloudburst in Copenhagen. This destructive cloudburst left 50,000 homes without heat for a week, impacted over 90,000 insurance claims, and caused upwards of 6 billion DKK in property damage (Asla, 2016; Naturstyrelsen, 2013) (see figure 1). Events such as these have resulted in a growing awareness of the negative effects of climate change and its substantial influence on the urban structures and life within cities. Consequently, there is a wish to develop cities that are adaptive to these effects, as well as being attractive for people to live in (Healey, 2015).

Figure 1. Shows the devastations as a result of the July 2011 cloudburst in Copenhagen with sewage water overflowing a road (Københavns Kommune, 2012)

Cities are indeed taking bold actions to climate adapt in ways that ensure that the urban space under (re)development is taken into consideration. There are numerous examples of climate adaptation projects where the potential for creating synergies between urban space aspects and the technical - water management related - solutions are explored (some of which are presented below). Yet, Copenhagen municipality has arguably entered a new era of climate adaptation; an era where the projects' contributions to the 'good' city are heavily influenced by the potential allocation of urban space funds. This is a new challenge that has not yet been explored since no urban space project with these conditions has yet been completed. In effect, the cloudburst management project on Strandboulevarden, a boulevard in Østerbro, Copenhagen, is the first project of this kind in Copenhagen and hence, the case under investigation in this thesis.

As such, this report constitutes a thorough examination of the complexities that occur when spatial urban qualities suddenly have to compete or, at least, 'fight' for their survival, in a project where the funds available are to be spent on technical solutions only. This thesis explores how practitioners can navigate these complexities towards a solution that contributes to the creation, or at least the maintenance, of a 'good' city. The following chapter presents a broader introduction to the topic under investigation and closes by presenting the research question of this master's thesis in Sustainable Cities.

1.1 A Climate Change Adaptation Paradigm

According to the IPCC, climate adaptation refers to "*the actions taken to manage impacts of climate change by reducing vulnerability and exposure to its harmful effects and exploiting any potential benefits*" (Allen et al., 2018, p. 51). A possible solution for climate adapting cities is to expand sewer systems to be able to contain more watera during extreme events. Alternatively, separate sewer systems are an option, whereby rainwater and wastewater are separated into two different pipes (ibid.). Both of these traditional - 'grey' infrastructure - solutions are, however, extremely costly and do not offer many opportunities for exploiting any potential benefits, but merely produce 'low-sustainability' solutions (Alves et al., 2018). Furthermore, the uncertainties related to the amount of precipitation occurring as a result of climate change make planning for traditional stormwater management measures strenuous (Allen et al., 2018). 'Grey' solutions do not offer the flexibility needed to ensure the safety and comfort of the people living in the city since the pipes are extremely costly to upgrade (Steffensen, 2014). Consequently, urban planners and water experts across the globe have started to demonstrate how water management can be done on the surface with more sustainable and flexible solutions (Københavns Kommune, 2012).

1.1.1 Reconfiguring the Urban Landscape Through Blue-green Solutions

The use of non-traditional drainage measures, also known as blue-green solutions, are increasingly being implemented. Examples include green roofs, retention basins, rain gardens, and more (LAR i Danmark, 2019). Such measures have increased in popularity, amongst others, due to the additional benefits that they offer (Alves et al., 2018). As the European Environmental Agency (2017) state, blue-green solutions facilitate climate change adaptation and mitigation, improve health and quality of life, and favour biodiversity conservation. Besides a decrease of rainwater runoff and protection against

floods, green surface solutions also provide ecosystem services, temperature improvements, carbon storage and sequestration and pollution control, as well as aesthetic and recreational services (Ong, 2002, cited in European Environmental Agency, 2017).

A Danish example where a blue-green solution is implemented is the first climate resilient neighborhood of Copenhagen; Skt. Kjelds Kvarter on Østerbro. This neighborhood was chosen as an exhibition area for climate adaptation in Copenhagen. The vision was to transform 20 percent of the covered surfaces to green surfaces and that 30 percent of the rainwater should be handled locally instead of through the sewer system (Klimakvarteret, n.d.). Tåsinge square (*Tåsinge plads*), in the climate resilient neighborhood, is a good example of a retention road and space (Copenhagen municipality, 2014). The square used to consist of a bunker with wild vegetation, surrounded by a huge paved area in the form of road and parking spaces. It was amongst locals referred to as an asphalt area which served no purpose.

Figure 2. Tåsinge square, before and after completion of the climate adaptation project (Image from Klimakvarter, n.d)

The two pictures (Figure 2) show Tåsinge square before and after the refurbishment. The introduction of a climate adaptation surface solution has made the square green and a better urban square for people to stay and play in. The square tells the story of a neighborhood where rain is welcomed and where nature is to be found in the middle of an urban space (Klimakvarter, n.d.). It is a fine example of how climate adaptation on the surface can be a driver for reconfiguring the urban landscape.

Similar to Copenhagen, numerous cities across the globe are looking to use blue-green solutions for adapting to climate change. World-wide cities are experimenting with alternative ways of handling stormwater, mitigating urban heat island effects and the like. In the United States, for instance, Philadelphia and New York City are leading the way with model-breaking green infrastructure plans (Asla, n.d.). New York City's Green Infrastructure plan estimates that annual energy demands and CO^2 emissions will be drastically reduced, that air quality will be improved and there will be a $4,725 property value increase for every fully vegetated acre of green infrastructure implemented (ibid.).

Clearly, blue-green solutions are gaining momentum across the globe. Understandably, however, the changes in practices needed to move from a traditional approach to adapting these new alternative ways requires both acceptance and the capacity to adapt new practices by urban planners and water experts alike.

1.1.2 Cloudburst Management as an Integral Part of Urban Planning

Climate change adaptation requires more than thinking about technical solutions, as it ought to be an integrated part of urban planning (Københavns Kommune, 2011). Planning is often concerned with dealing with wicked problems, as is the case when trying to climate adapt cities. Wicked problems being societal problems that lack simplistic, straightforward planning responses (Rittel and Webber, 1973). Levin et al. (2012) go as far as calling climate change adaptation a 'super wicked problem' because of the following points: time is running out; there is no central authority able to manage the definition of the problem; those seeking to solve the problem are also causing it, and policies discount the future irrationally (ibid.). All this creates a tragedy because governance institutions and their policies mostly respond to short-term time horizons (ibid.).

Blue-green alternative solutions indeed bring with them new challenges, since the transition to mainly surface based solution interferes with the development and design of urban spaces. According to Broto and Bulkeley (2013), analyses of urban climate change responses have typically focused on the policy sphere and the development of plans and strategies to address the issue. Yet, acknowledging that urban infrastructure - understood as the socio-technical matrix that facilitates the provision of services needed for urban life - is critical to any urban response (ibid.). In effect, this new paradigm of blue-green solutions suggests that urban infrastructures - such as cloudburst management technical solutions - should have multiple functions with an emphasis on bringing forth urban qualities. In fact, blue-green solutions offer an opportunity for looking at cities through a new lens; a climate adaptation lens. In effect, "*choices made in cities today about long-lived urban infrastructure will determine the extent and impact of climate change, our ability to achieve emission reductions and our capacity to adapt to changing circumstances"* (OECD, Bloomberg Philanthropies, 2014).

Conclusively, the fundamental changes that climate adaptation imposes, generate multiple opportunities for cities to reconfigure the urban landscape. The aforementioned Tåsinge square being a great example of a pilot project showcasing how a cloudburst project on the surface can create urban spaces. As such, considerations about how synergies can emerge when climate adapting are also highly relevant in the case of Strandboulevarden. Yet, contrary to Tåsinge square, the Strandboulevarden project is not a demonstration project, and it was not allocated urban space funds, whereby the urban space aspects in certain situations have to compete with the more prevailing technical and financial aspects, as will become apparent throughout the report. Indeed, it would seem that financial frames dictate the design of cloudburst management projects.

1.1.3 The Prevalence of the Technical Solutions

In the last century, urban water systems were typically designed to be large and centralized, seeking efficiency and stability through economies of scale (Porse, 2013). Accordingly, the management system and institutions were centred around the fulfilment of performance goals on the basis of a rational planning approach (ibid.). The implemented systems made huge improvements in public health and flooding reductions for urban residents in many cities (ibid.). Yet, these systems had a highly technical priority and had thus little to do with urban planning.

An effort to a transition to more sustainable cities, however, requires institutions to evolve beyond this rational approach as it naturally encompasses a larger variety of desires. This is especially due to the integration of the previously separate rainwater system into the urban landscape, which inevitably blurs previously administrative and infrastructural boundaries. In fact, most obstacles to sustainable urban water management practices are institutional and not technical (Porse, 2013). According to Porse (2013), major barriers include "*established physical and bureaucratic infrastructures combined with institutional memory to perpetuate existing systems and slow reforms"* (Porse, 2013, p. 32). Thus, a major challenge lies in the institutional paradigm shift where traditional institutions, practices and infrastructures that produced and reproduced urban space and water management solutions are forced to evolve. The problem in that regard is not the technical solutions since they already exist, the challenge is how these technical solutions are implemented as an integrated part of the urban development, without risking overshadowing the qualities of the urban space. This calls for new approaches and structures in order to support this development, which represents a central consideration in the analysis of the Strandboulevarden case.

1.1.4 The Dynamics Between Three Central Perspectives: Water Management, Finances and Urban Space

Cloudburst management efforts in Copenhagen municipality has arguably come a long way. Nonetheless, practitioners still face institutional challenges in their everyday work. In the case of Strandboulevarden, challenges especially emerge from dynamics and tensions between three central perspectives; technical/hydraulic, financial and urban space. Whether the focus is on technical or recreational perspectives or both, seems to depend on how the project is funded and especially, whether urban space funds are allocated. As emphasized by Steffensen (2014), there is a risk that the green and recreational elements on the surface of cloudburst solutions are overshadowed by the water management perspectives, thus reducing their effect and value. Accordingly, it would seem that there is a kind of competition between the hydraulic, financial and urban space aspects, which needs to be considered. This represents the central focal point of this research and is arguably highly relevant for Copenhagen municipality as they emphasize the ambition of achieving synergies through their cloudburst management projects, as elaborated in the following.

1.2 Planning for Climate Change Adaptation in Denmark

Climate change adaptation (CCA) has become an integral part of Danish municipalities' and utility companies' planning practices following especially the heavy cloudburst of 2011. In 2013, as a part of the municipality's economical agreement between the National Organization for Municipalities (*Kommunernes Landsforening*) and the government, it was decided that the municipalities should develop climate adaptation plans (Erhvervsstyrelsen, 2019). The agreement commits all municipalities to make risk mapping of their areas and to develop climate adaptation plans (Naturstyrelsen, 2013). These plans establish an overview and prioritization of the climate adaptation efforts within the different municipalities, creating the basis for future climate adaptation efforts in Denmark.

In Copenhagen, the municipality developed a Climate Adaptation Plan in 2011, which outlines the challenges the city faces in the short and medium term, as a result of expected climate changes in the future (Københavns Kommune, 2011). In order to concretize the efforts for cloudburst management, specifically, the municipality, furthermore, developed a Cloudburst Management Plan in 2012 (Københavns Kommune, 2012). The plan outlines the methods, priorities, and measures recommended for climate adapting the city. One major focal point is to invest in climate adaptation solutions, which beside dealing with rainwater, also contribute to city development (Københavns Kommune, 2011). This is done by working with flexible solutions, where rainwater management is integrated with design, urban planning and the development of recreational spaces (ibid.). As such, climate adaptation and the planning of an attractive and green city become two sides of the same coin. Yet, the current financing mechanisms for climate adaptation do not reflect this 'two-sided coin'.

1.2.1 Financing Climate Adaptation

Traditionally, climate adaptation measures have primarily focused on concerns about water management. In Denmark, the utility companies are responsible for water management. As an example, HOFOR, the utility of Copenhagen, own and maintain the sewer system and have the responsibility of handling the water (Steffensen, 2014). HOFOR is owned by the 29 municipalities in the Capital Region but is driven as a private company (Region Hovedstaden, n.d.). The municipalities steer the utility company through a set of laws, regulations and control instances (ibid.). This divide is described in the Danish Water Sector Law (*Vand Sektor Loven - Lov 469*), which separates water and wastewater companies from the municipality with the purpose of separating the utilities' operation from the municipalities (Lund, 2012).

> "*The utility company is primarily responsible for diverting wastewater, rain and surface water from properties that are located in public sewerage areas - also if the amount of water to handle is increasing as a result of climate change. The utility company is obliged to dimension the sewers so it can handle the necessary amounts of water.*"
>
> (Lund, 2012, p. 25 - own translation)

However, with the new approach to climate adaptation - where authorities seek to combine technical cloudburst management solutions and recreational spaces - the collaboration between municipalities and utility companies have once again come closer. This suggests that this divide of municipality and utility company is a key challenge for green and recreational cloudburst solutions. As municipalities

are responsible for the spatial planning of cities and utility companies for handling water on public land, a close collaboration is indeed needed.

When implementing blue-green surface solutions, utility companies are legally able to pay for the part of the solution that is necessary to handle the water, and the solution must, furthermore, be cheaper than the conventional sewer solution (Steffensen, 2014). The Water Sector Law thus represents a central limiting factor in a cloudburst management project where no urban space funds are allocated, as in the Strandboulevarden case, since this completely undermines the urban space aspects. In a Danish climate adaptation evaluating report from 2014, the separation between the municipalities and utilities is strongly questioned (Krawack, 2014). Still, Krawack (2014) explains that the utilities find it appropriate because they can concentrate on a clear and technical task, while being independent of changes in political prioritization in the municipality (ibid.). This is a central political discussion, yet it will not be further delved into in this report since focus lies on practitioners and their navigational practices. Nonetheless, it becomes apparent that the technical task of securing the city against floods is given central priority, which can arguably lead to a neglection of the urban space-oriented perspectives. Yet, as aforementioned, Copenhagen is striving to find synergies in their projects.

1.2.2 Comprehensive Cloudburst Management Efforts in Copenhagen

In 2015, a Climate Adaptation and Investment Statement was made whereby Copenhagen concretized their cloudburst management effort. The statement lays the ground for 300 specific projects spread across the city that in conjunction will relieve the pressure on the sewer network, at the same time as protecting the cultural heritage and the homes and commercial properties of Copenhageners against flooding (Københavns Kommune, 2015c). The 300 projects imply that instead of sending the water from cloudbursts and everyday rainfalls into the sewers, a completely new infrastructure is to be established for stormwater management, where cloudburst management solutions on the surface are combined with pipes below the ground which retain and steer the water before subsequently discharging it into lakes and the harbour (ibid.).

With this, the city of Copenhagen, and its politicians have decided on an approach to secure the city against a 100-year rain event - which statistically occurs once every 100 years - through a combination of surface and subsurface solutions (Københavns Kommune, 2015c), i.e. blue-green-grey solutions. Executing the plan is estimated to take 20 years and to cost approximately 11 billion Danish kroner (DKK) financed through both public and private funds (see table 1). Overall, this represents a significant change in the institutional setup and focal point. Through a variety of strategies, plans, and sources of funding, amongst others, cloudburst management has become a core agenda with organizational, institutional and governance reverberations.

Table 1. Construction estimate for alternative solutions in 2015-prices (mio. DKK) (Københavns Kommune, 2015c).

Construction	**Construction costs mio. DKK**	**Financing**
Surface solutions	4.975	Municipal and private co-finance projects refunded by utility funds
Cloudburst solutions	2.600	Utility funds (HOFOR)
Decoupling and connection to sewer outside boundaries	1.010	Utility funds (HOFOR)
Securing of housing with backflow blocker and decoupling inside boundary	2.420	Landowners
I total	11.005	
Addition of urban space improvements	1.000	Copenhagen Municipality

Regarding the source of funding, a large chunk of the money is dedicated to surface solutions, whereof the municipality is estimated to construct and own projects for roughly 3.3 billion DKK (ibid.). This portion of the cloudburst plan is 100 percent financed through co-financing with the utility company of Copenhagen; HOFOR, where the municipality obtains a loan that HOFOR pays off over a 25-year period (BEK nr. 159 of 26/02/2016).

The catch with the ambition to upgrade urban spaces through co-financed surface solutions is, though, that the financing regulations heavily restricts what can be funded (further elaborated in Chapter 4.3). According to legislation, the utility companies are limited to only cover expenses that are necessary for handling roof and surface water (§2, BEK nr. 159 of 26/02/2016). Thus, the presence of allocated urban space funds is necessary to really implement recreational elements into the solution. Therefore, regarding the implementation of the cloudburst solutions it was further estimated to be beneficial to add additional urban space funds to an estimate of 1 billion DKK (table 1), to gain synergy effects as the co-finance funds accommodates some of the costs otherwise required to upgrade an urban space (Københavns Kommune, 2015c). The additional funds for upgrading the urban space must gradually be allocated by the local politicians in the local Council (Københavns Kommune, 2015c). The success of the before mentioned Tåsinge Plads, being an internationally renowned project for successfully integrating climate adaptation in the urban landscape, shows how a livable and recreative space can be created when urban space funds are available.

However, it is far from certain that all projects will be allocated additional urban space funds, and many will likely have to make do with solely co-financing funds - Strandboulevarden being the first larger urban space project of its kind. These projects, in particular, have to be open to scrutiny as they constitute major reconfigurations of the urban landscape and therefore, affect the quality thereof. Indeed, it is these particular projects that interest this thesis, since the dynamic between technical, urban space and financial aspect becomes stricter and more obvious. In the following, a brief description of the case of Strandboulevarden is presented.

1.2.3 The Strandboulevarden Project Case

Figure 3. Shows a picture of Strandboulevarden in its present form.

The Strandboulevarden cloudburst management project is located in the northern part of Strandboulevarden; a large street and urban space in the city district of Østerbro in Copenhagen. The project constitutes the backbone of securing the local area against cloudbursts due to both its vulnerability to floods and due to being the only place with enough space to integrate sufficient retention capacity within the local area (Københavns Kommune, 2015; Steffensen, pers. comm.). The green carriageway (as seen on the illustration in (figure 3) which currently divides the four car lanes on Strandboulevarden, is projected to function as both an everyday rain management retention basin and for alleviating pressure during heavy downpours (CKT, 2018). Yet, while these water management related components are essential for securing Østerbro from future floods, the area also represents a vast urban space, where people walk their dogs, take a break on a bench in the green carriageway or enjoy watching the changing seasons on the many big trees characterizing the boulevard as it is now (ibid.). However, the project is solely financed by utility funds, meaning that it is financed by water tariffs - whereby everything the utility company, HOFOR, pays for must have a water management function (CKT, 2018). Accordingly, there are only funds available for the things that contribute to improving the urban space of Strandboulevarden if these have a hydraulic purpose. This represents the main challenge considered in this thesis. As such, the general frames in the project can be translated to (ibid.):

- The contribution to implementing Copenhagen municipality's Cloudburst Management Plan; safeguarding the inhabitants of Inner Østerbro from flood and sewer water accumulating in their basements during cloudbursts.
- The creation of a green solution on the surface of Strandboulevarden which combines water management with better frameworks for urban nature and urban life as much as possible based on existing local values and norms.
- The establishment of a cost-effective urban space-based cloudburst solution on the surface rather than a traditional (underground) pipe solution.

The case of Strandboulevarden is the first project to make a blue-green transformation in a distinct cultural, historical urban space without money for spatial improvement (CKT, 2018). Thus, Strandboulevarden is a 'minimum project' constituting a new type of landscape in the city where aesthetics and architectural design is cut all the way to the bone due to the technical and financial bindings (ibid.)

Conclusively, this thesis is concerned with investigating this case, focusing on how practitioners are navigating the dynamics in developing a 'good' solution despite the financial constraints.

1.3 Creating the 'Good' Solution in Strandboulevarden

In general, one of the central institutional challenges faced by planners is the task of trying to balance the development aims of specific individuals and groups with the broader societal needs, including environmental protection, delivery of social services, infrastructure, public space, aesthetics and liveability (Mathews, 2013). The cloudburst management system is, from a societal perspective, a necessity in order to protect against floods, but following the implementation of surface solutions, new aims and goals become relevant as well in cloudburst management. In the Strandboulevarden project, the importance of a connected urban space is, for instance, emphasized.

It is through the planning process that the values and images of what society wants to achieve are defined (Albrechts, 2004). In this regard, Gunder (2005) comments that planning is inherently ideological in its discourses and practices so that the visions and ideals shaping the fantasies of the future city are often reflective of the homogenous desires of conflicting, but dominant, privileged minorities. This indicates a somewhat pre-determined, unequal process of determining relevant desires to pursue. An example being the pre-determined technical necessity of cloudburst management solutions, which are at risk of overshadowing possibilities for improving the quality of the urban space (Steffensen, 2014). Notably, values and images are not produced in isolation but are created and given meaning within a specific context. "*They are validated by traditions of belief and practice, and are reviewed, reconstructed, and invented through collective experience"* (Albrechts, 2004, p. 750).

Gunder (2005) claims that a way in which the privileged minorities exert control is by framing the process with a problem-solving agenda through technically defining the problem and its resolution. By the deployment of rhetorical tropes - claims of value neutrality, rationality, science and expertise serve as a means of validation to legitimize the endeavor (ibid.). Following this line of argumentation, climate adaptation projects are validated and legitimized through depicting the consequences of the cloudburst event in 2011; it is in everyone's interest to secure the city against future cloudbursts. The resolution, i.e. the combination of surface and subsurface solutions and their placement, is further validated and developed by experts, who deploy a scientific rationale as justification for the solution. As a result, thereof, little room is left for (re-)defining what potentially could become since:

> *"the privileged issues of contention are pre-shaped by unquestioned cultural imperatives and 'technically' determined. The rationality deployed in this 'societal guidance' only allows a limited range of 'sensible', i.e. preframed, dreams, or options, of what constitutes the 'sustainable', 'healthy', 'competitive', or perhaps 'creative' city as 'good'."*
>
> (Gunder, 2005, p. 175)

In the case of securing Copenhagen against floods, the problem and its resolution are already technically pre-defined. The institutional setup and, in particular, the Cloudburst Management Plan, establishes a problem-solving agenda through clearly defining an infrastructural, i.e. 'technical' lack and a structure for its resolution. Consequently, large amounts of resources are allocated to this very resolution, but who is to say that this is what the majority of the population desires? The desire to solve the pre-defined problem and or to solve it through the pre-shaped resolution might not necessarily reflect the desire of 'the others', but merely the privileged minorities. Inherent to this reflection is a critique of the process of ordering that dictates what a place ought to be, what is to be

considered the morphology of a 'good' city, criticized for having a history of excluding 'the others' and thus leaving little room for alternative visions of what a place potentially could become (Eizenberg, 2018; Munthe-Kaas, 2017). Thus, relevant points of scrutiny concern who dictates and influence the direction that these transformations take, whether that direction is desirable and for whom it is desirable.

As earlier stated, planning is an activity that seeks to improve social and environmental well-being in a world of diverse people, where one must pursue actions that promote just and sustainable outcomes. The Co-finance Note, however, limits what is possible regarding the creation of urban space in projects such as Strandboulevarden. There is no doubt that the solution chosen in Strandboulevarden will be of a high technical standard and deliver in terms of cloudburst management since this is what HOFOR can fund. Yet, in terms of contributing to the development of the urban space, which can bring additional value to the area and help create the 'good' city might be doubtful. As Steffensen (pers. comm.), Hede (pers. comm.), Bjørneboe (pers. comm.) and others working at Copenhagen Municipality comment during interviews for this thesis, there is a high chance that there will be more projects like Strandboulevarden in the near future. The project is thus considered a pilot project, that potentially can serve as a model for a new and necessary urban space in Copenhagen in connection with the implementation of the Cloudburst Management Plan (CKT, 2018 p. 7). According to the municipality, cloudburst and retention roads, such as Strandboulevarden, will be a new type of landscapes in the city where aesthetics and architectural design is cut all the way to the bone due to the technical bindings which comprise the economic purview (ibid.).

Accordingly, the ambition of the research team of this thesis is to investigate how practitioners at Copenhagen Municipality can ensure the creation of a 'good' urban space in projects with no additional urban space funds. Furthermore, as an external researcher, one must also be mindful of what defines the 'good' solution as the term is intrinsically ideological and therefore loaded with assumptions and beliefs. Hence, an examination of how the 'good' solution is defined and interpreted by the different actors involved becomes crucial. The following sums up the problems field and defines the problem formulation of this thesis.

1.4 Problem Area and Research Question

Climate change adaptation is an imperative and institutional challenge that cities need to act upon. The new paradigm of climate adaptation emphasizes the creation of blue-green and sustainable solutions on the surface, which presents possibilities of synergies between cloudburst management solutions and the creation of green urban spaces. However, this requires institutions to evolve beyond the rational approach that previously characterized the (re)development of water management and urban spaces, to encompass a larger variety of desires. This is especially due to the integration of the previously separated rainwater system into the urban landscape, which inevitably blurs preceding administrative and infrastructural boundaries.

In Copenhagen, high ambitions are stated in the visions of the Copenhagen Climate Adaptation Plan. Nonetheless, political prioritizations and limited urban space funds strongly influence the degree to which these ambitions can be materialized. The case of Strandboulevarden is the first project to make a blue-green transformation in a distinct cultural historical urban space where no funds have been allowed for spatial improvements. It is considered a 'minimum project' constituting a new type of landscape in the city, where aesthetics and architectural design is cut all the way to the bone due to the prevalence of the technical and financial bindings.

Being the first 'minimum project' represents an opportunity to develop practices for how the complexities inherent to such projects are to be dealt with. This implies unveiling what influences action, how the 'good' solution in a 'minimum' project is defined, and how practitioners act through their everyday work towards defining the 'good' solution. The following research question and sub-questions situate and formulates the problem of investigation in this thesis.

Using the case of Strandboulevarden, how can practitioners - conducting cloudburst management projects that do not have any funds allocated for urban space development - navigate towards a solution, which contributes to the creation, or at least the maintenance, of the 'good' city?

To investigate and answer this problem, four sub-questions have been formulated. These questions structure the research and analysis and allow for a theory-based analysis of the different challenges and perspectives related to the subject.

- What constitutes the organizational field that the Strandboulevarden project is embedded within, and how does it influence the work towards the 'good' solution? (Chapter 4)
- How are different interpretations of the 'good' solution embedded within occupational communities and institutional logics? (Chapter 5)
- How do practitioners, through everyday activities, navigate the institutional complexities of the project? (Chapter 6)
- What can practitioners learn from the case of Strandboulevarden and use in future projects with similar financial conditions? (Chapter 7)

2. Theoretical Framework

This chapter describes the theories used to answer the research question: "*Using the case of Strandboulevarden, how can practitioners - conducting cloudburst management projects that do not have any funds allocated for urban space development - navigate towards a solution, which contributes to the creation, or at least the maintenance, of the 'good' city?"* In answering this question, this thesis adopts a practice-driven institutionalism approach to gain a better understanding of the improvisations and experimentations through which new solutions are discovered and the agency through which they emerge (Smets et al., 2017). Considering the wish for developing practices or suggestions for future cloudburst projects similar to Strandboulevarden, this is extremely relevant. In order to provide the field with suggestions for future similar projects, this thesis is specifically on the lookout for these improvisations and experimentation that the practitioners within the project utilize in the development towards the 'good' solution.

To understand how practitioners, navigate towards the 'good' solution, one needs to understand what influences both the definition of the 'good' solution and what guides practitioners' actions. By shedding light on institutional components, the 'rules of the game' can be uncovered and how choices are shaped and mediated can be better understood (Hoffman, 2001). In the case of Strandboulevarden, different interpretations of the 'good' solution strain the course of action in various directions. These interpretations are manifested in the 'rules of the game', the involved organizations and in the moral imperatives of the involved practitioners.

To comprehend individual and organizational action, it must be seen as embedded in a socio-institutional context which guides and dictates behavior, but which also leaves room for agency and change - as it is socially constructed. Thus, the theoretical framework takes a point of departure in an understanding of society composed of three levels; Institutions, organizations and practitioners, which mutually constitute each other. In the following, conceptualization of these levels and the dynamics in between are presented.

2.1 Institutions, Organizations and Practitioners

Since this thesis focuses on how practitioners can navigate the complexities of a societal challenge - finding synergies when climate adapting the city - it becomes necessary to examine the institutions within which the practitioners involved in the Strandboulevarden project are embedded. Indeed, by looking at institutions, it is possible to answer questions about how social choices are shaped, mediated, and channelled (Hoffman, 2001). Foremost, there is a need to address what an institution is and how it is perceived in this thesis.

Institutions are the kinds of structures that make up social life (Hodgson, 2006). In fact, most human interactions and activities are structured in terms of clear and implicit rules. Institutions can thus overall be defined as "*systems of established and prevalent social rules that structure social interactions"* (Hodgson, 2006). Examples include language, money, law, systems of weights and measures; all of which are institutions since they regulate social activity (Hodgson, 2006). Regarding the context of Strandboulevarden, an institutional component is a legislation that regulates how climate adaptation is to be carried out in municipalities. Another example of an institutional system is the planning law that regulates spatial planning in Denmark, thus framing urban planning in Copenhagen. Institutions are the socially constructed entities that exist to reduce uncertainty and provide structure to social engagement (Matthews, 2013). In short, institutions govern through the

development of social constraints in society and are made up of formal and informal constraints (Matthews, 2013). Formal constraints include laws, policies and constitutions. Informal constraint comprises less rigid social conventions and accepted norms. The following example from Connor and Dovers exemplifies institutional constraints;

> *"A single constraint may be that all drivers must possess a licence, multiple constraints may state that a driver must also have adequate insurance, whilst hierarchical constraints may state that a driver can only obtain a licence and insurance if they first submit to driver behaviour classes and undergo structured testing to ensure they are competent to drive on public roads."*
> (Connor and Dovers, 2002, p. 7 cited in Matthews 2013 p. 200).

While this exemplifies the institutional constraints designed to manage the behaviour of car-drivers, this notion of institutional constraints is also highly relevant in the case of urban planning and climate change adaptation. Healey et al. (1999) state that planning is "*a set of governance practices for developing and implementing strategies, plans, policies and projects and for regulating the location, timing and form of development"* (Healey et al., 1999, p. 31 cited in Matthews, 2013). Hence, the planning regime acts to regulate development activities within predefined frames, designed to direct actors' actions (Matthews, 2013).

Following this line of thought, the central institution in this project are the overall guiding and regulating principles for cloudburst management, which in turn is composed of a subset of institutional constraints. These constraints frame the behaviours and activities within the practice of cloudburst management in Copenhagen. An example hereof is; in order for a utility company to finance a cloudburst surface solution in the form of e.g. green retention basins, the solution must be cheaper than a conventional solution, e.g. expansion of the sewers. Furthermore, the utility company can only finance the part that is necessary in order to handle the necessary amount of water. Consequently, the financial frames dictate the design of the solution, positioning the urban space aspects in potential competition with the technical water management elements. In effect, to be able to finance more than what is merely hydraulic justifiable, political allocated urban space funds are necessary (Steffensen, 2014; Hede, pers. comm). These legal regulations thus represent formal institutional constraints which regulates cloudburst management activities. This is exactly why institutional components are interesting and relevant to investigate; they make up the 'rules of the game' and helps to explain how choices are shaped and mediated (Hoffman, 2001). It thus becomes interesting to look at the institutional frames that encompass the project of Strandboulevarden, and especially how they influence the three institutional logics of water management, urban space and finances through practitioners' practices.

According to Hoffman (2001), institutional analyses ought to be combined with an organizational analysis as it enables not only the unravelment of how social choices are shaped, channeled and mediated, but also how they relate to subsequent action. In this view, the dynamics that influence individual action are inter-related to organizational, institutional and inter-institutional forces (Hoffman, 2001; Thornton and Ocasio, 2008; Smets et al., 2017). This takes point of departure in an understanding of society composed of three levels - individuals competing and negotiating, organizations in conflict and coordination, and institutions in contradiction and interdependency (Thornton and Ocasio, 2008). The following figure 4, visualizes these three levels of society and how the divide can be made in the example of cloudburst management in Copenhagen.

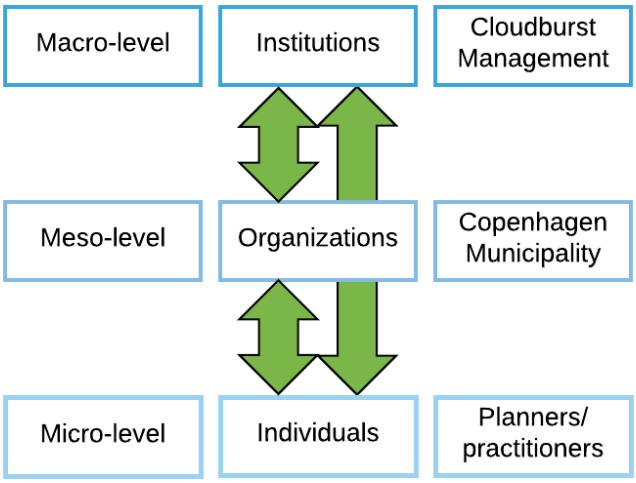

Figure 4. Visualization of the three levels of society, the macro, meso and micro level and how they mutually constitute each other (own visualization).

The important point is that one cannot solely focus on one level in isolation from the others as all three levels are imperative to adequately understand society and thereby understand how choices are shaped (Thornton and Ocasio, 2008). Berger and Luckmann explain it as such:

> *"Rather than privileging one level over another, this perspective suggests that while individual and organizational action is embedded within institutions, institutions are socially constructed and therefore constituted by the actions of individuals and organizations."*
> (Berger and Luckmann, 1967 cited in Thornton and Ocasio, 2008, p. 6)

As such, organizations like Copenhagen municipality do not have autonomous influence over neither the development nor implementation of strategies for cloudburst management. Their actions are subject to, and bound by, social processes and institutional arrangements which make up the spectrum of legitimate repertoires devised by a range of organizations that constitute the organizational field (Hoffman, 2001).

2.2 The Organizational Field

The organizational field is the domain in which organization's actions are formed, defined, and subsequently redefined by the network of relations wherein they are embedded (Hoffman, 2001; Wooten and Hoffman, 2008). As Hoffman states:

> *"The field is a composite of constituents within the firm's external social, political, and economic environments. [...] But more than just a collection of influential organizations, the field should be thought of as the center of common channels of dialogue and discussion. The field forms around a central issue - such as the protection of the natural environment - whereby competing interests negotiate over issue interpretation."*
> (Hoffman, 2001, p. 135)

The field comprises a multiplicity of actants including sources of funding, critical exchange partners, professional associations, regulatory groups, the general public, special interest groups, as well as

other forms of cognitive and normative influences that affect organizational and individual action (Scott, 1991 cited in Hoffman, 2001). Given the scope research of this study, the organizational field revolves the issue of cloudburst management. The field is, amongst others, comprised of organizations such as Copenhagen municipality and more specifically the Center for Climate Adaptation (*Center for Klimatilpasning*, referred to as CKT), which are responsible for carrying out cloudburst management projects in Copenhagen, HOFOR - the utility company, and the consultants that are involved in the projects contemporary and future phases (see figure 5). However, the field not only encompass organizations, but also inherent dynamics - e.g. the division of responsibility and decision-making power. Notably, this research deploys a 'follow-the-actor' approach (see Chapter 3 - Methodology) and are, furthermore, delimited to the case of Strandboulevarden. As such this research does not encompass the organizational field in its entirety, but solely significant elements for the project of Strandboulevarden, as defined by the empirical data (see Chapter 4).

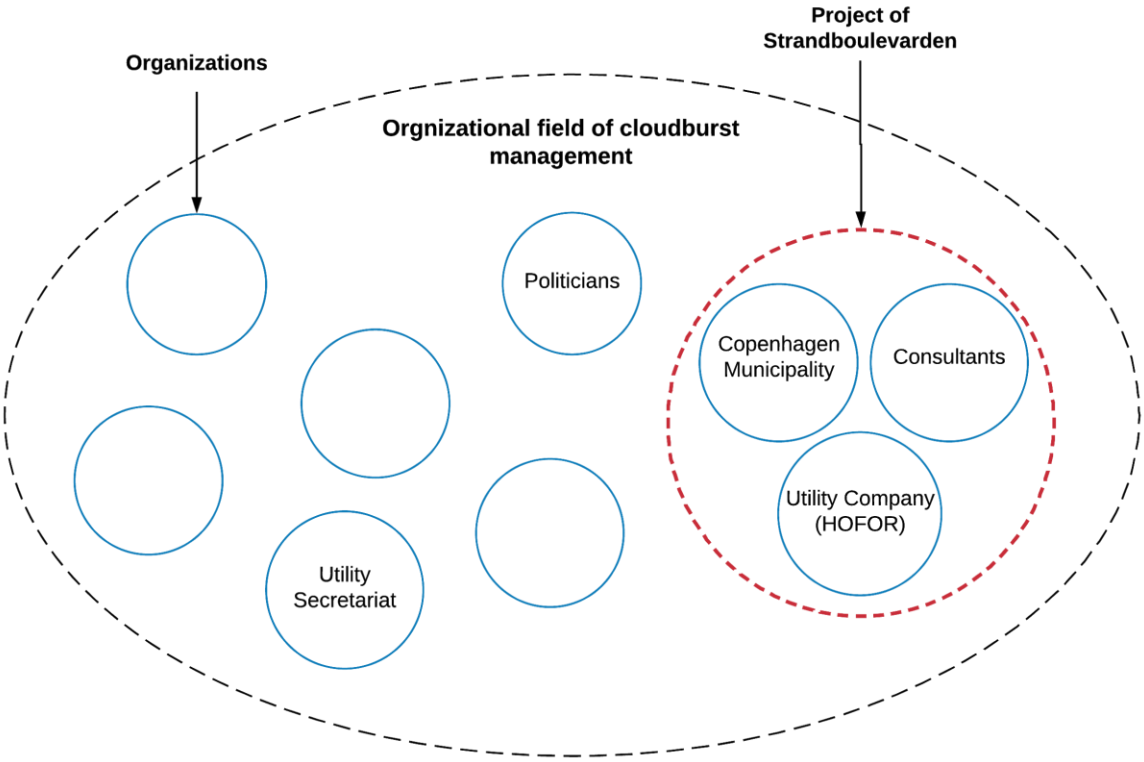

Figure 5. A simplified visualization of the organizational field of cloudburst management as seen in this study (own visualization).

The organizational field both encompass and is influenced by institutions. Institutions that generate valid descriptions of reality, appropriate goals to pursue and means for their fulfillment (Hoffman, 2001). Hoffman (2001) defines these perceptions as cultural frames which are enacted through various field-level constituents that each deploy and articulate their own issue interpretation through a diversity of institutions and cultural artifacts (Hoffman, 2001).

An example hereof, is the Copenhagen Climate Adaptation and Investment Report from 2015. The report clearly defines a problem concerning handling the more intense rainfalls, suggests solutions and a method for implementing cloudburst solution in Copenhagen, thus creating the frame for working with cloudburst management in Copenhagen (Chapter 4.1). In that regard, the subsequent execution of cloudburst projects is framed by the purview it constitutes which in turn is inherently

normative. As such "*culture shapes individual consciousness throughout the organization, imposing routines that reflect socially approved, purposive action"* (Jackall, 1988 cited in Hoffman, 2001). In the case of Strandboulevarden, this could help explain certain choices, argumentations and perspectives of what constitutes the 'good' solution. One concept, which can explain these cultural frames and their influence on practitioners' activities in given situations, is the notion of 'Institutional Logics', which has gained a greater attention in present Institutional theory.

2.3 Institutional Logics - Prescriptions of the 'Good' Solution

In the case of Strandboulevarden, there are several forms of normative influences on the practice of cloudburst management. These normative influences, which are supported by institutional frames and organizations within the organizational field, potentially strain the definition of the 'good' solution into opposite directions by a variety of 'Institutional logics'.

Even though various, albeit to some extent similar, definitions of institutional logics exist, the most common definition applied (Smets et al., 2017; Thornton and Ocasio, 2008) is institutional logics as:

> *"the socially constructed, historical patterns of material practices, assumptions, values, beliefs, and rules by which individuals produce and reproduce their material subsistence, organize time and space, and provide meaning to their social reality"*
> (Thornton and Ocasio, 1999, p. 804, cited in Thornton and Ocasio, 2008).

Indeed, this definition implies ties not only to organizational theory, but also to practice theory through the recognition of material practices as an interrelated element (as will be elaborated upon shortly). The term 'institutional frames' was initially developed by Alford and Friedland (1985, cited in Thornton and Ocasio, 2008) to depict the contradictory beliefs and practices entangled in the institutions of modern western societies. Similarly, to cultural frames, they described institutional logic as shapers of organizational principles and, furthermore, as help for actors to make sense of their reality through the provision of motive and sense of self (ibid.). The logics guide the construction of identity and action, but are simultaneously available for groups, organizations, and individuals to use to their own advantage, manipulate and further elaborate (Thornton et al., 2012; Friedland and Alford, 1991 cited in Thornton and Ocasio, 2008). As such, Institutional logics shape legitimate, mindful behaviors and conversely, actions by organizational and individual actors' influence the production and reproduction of the logics (Thornton, 2004 cited in Thornton and Ocasio, 2008).

In the case of cloudburst management in Copenhagen, a central, or 'prevailing' logic is the technical aspect of water management. As Steffensen (2014) describes in his investigation of Copenhagen's future rainwater system, there is a significant danger that green and recreational elements will be overshadowed by the hydraulic perspectives. This was five years ago, but the cloudburst project of Strandboulevarden is still subject to the prevalence of this logic, considering its institutional frames (see Chapter 4). In effect, the actions and choices of practitioners involved in the project are shaped and guided by a water management logic. This is especially the case due to the lack of urban space funds, which heavily restrict to what extent other co-existing logics, such as the urban space logic, can influence the definition of the 'good' solution.

The assumption that values, interests, assumptions and identities of organizations and individuals are entrenched within prevailing institutional logics is essentially the core assumption of

this concept (Thornton and Ocasio, 2008). According to this line of thought, individuals and organizational actors might seek power and status, but the means and ends of their aspirations and agency are constrained and enabled by prevailing institutional logics (Giddens, 1984; Sewell, 1992 cited in Thornton and Ocasio, 2008). In this regard, portraying society as an inter-institutional system enables the unveiling of any given context as inherently implicated by a variety of potentially contradictory institutional logics (ibid.). This implies that the practice of cloudburst management is strained into potentially opposite directions by a variety of logics, e.g. financial, water management and urban space (see Chapter 5). These logics are constituted and utilized by different groups and practitioners within the organizational field, which is further elaborated in the following section.

2.3.1 Identifying Institutional Logics Through Occupational Communities

As the organizational field that encompasses the practice of cloudburst management consists of a variety of sub-populations such as engineers and architects, each adhering to and employing different logics for conceiving the issue, the type and manifestation of institutional pressure becomes equally distinct in its form and frame (Hoffman, 2001). Hoffman (2001) argues that these sub-populations with varied focus, defined as occupational communities actively translate and communicate corporate norms and beliefs into institutions, terms and cultural frames that reflect their own culture and interests (Hoffman, 2001). Occupational communities are groups of constituencies that cut across organizations and which share common language, perspectives and assumptions about the nature of business (Schein, 1996 cited in Hoffman, 2001). As such occupational communities within the organizational field of cloudburst management could be described as different groups of professions each adhering to different professional logics. As such, some practitioners from both the municipality, HOFOR and consultants might adhere to a technical water management logic, while others might adhere to a more aesthetic logic (as will be exemplified in Chapter 5). Practitioners might, however, as explained later in this chapter, utilize multiple logics in shaping their choices and argumentations.

Similarly, Thornton and Ocasio (2008) discus the exertion of institutional logics on individuals and organizations through the identification with collective identities of social groups. When individuals identify with the shared identity of the social group they belong to, they presumably cooperate with this social group, stand for its norms and prescriptions and strive to defend the interests of the collective and its members against competing identities (Thornton and Ocasio, 2008). Jackall (1998, cited in Thornton and Ocasio, 2008) states that, as collective identities become institutionalized, distinct institutional logics are established, and these logics dominate within the social group. Concludingly, identifying the occupational community within the organizational field of cloudburst management (in Copenhagen), can help identifying institutional logics since each of these sub-populations adhere to and employ different logics.

An example hereof is the different professions present in the case of Strandboulevarden. An identification with one of these professions would imply a strong focus on preserving the interests of colleagues or peers with the same professional background in accordance with the internal dynamics, priorities, values and identities of a given professional group (Berg and Pinheiro, 2016). These practitioners can be described as belonging to the same occupational community. As used in this thesis the identification and definition of occupational communities present in the project sheds light on the various professional logics. One important note is the method for doing so, since one is at risk of simplifying the reality to a degree beyond recognition, this is accounted for and explained in Chapter 3.3.3).

2.3.2 Co-existing Institutional Logics

Due to the multiplicity of occupational communities and therefore possible present institutional logics within the organizational field encompassing cloudburst management, conflict and competition is likely to occur between different institutional logics (Berg and Pinheiro, 2016). Similar to an example by Berg and Pinheiro (2016), although the institutional logic of a municipality brings together people from different professions, these professional logics are rooted in normative frameworks of a given profession. Tensions are thus more likely to emerge when logics are combined or mixed.

One of the central institutional challenges that face planning regimes is balancing the development aims of different individuals and groups with broader social needs, including environmental protection, infrastructure, public space, and livability amongst others (Matthews, 2013). These needs, that by themselves pose potential contradictory prescriptions, add to the inherent institutional complexity of planning regimes that seek to balance a diversity of societal and individual needs. Smets and Jarzabkowski (2013) use the term institutional complexity to refer to situations where divergent prescriptions from different logics collide (Smets and Jarzabkowski, 2013). The overall cloudburst management strategies are in Copenhagen framed by the Climate Change Adaptation Plan, Cloudburst Management Plan, and the Climate Change Adaptation and Investment Plan. These cultural frames entail an ambition of creating recreational green and blue urban spaces, while simultaneously securing the city against floods (Chapter 1, Introduction). This clearly depicts two societal needs and two different co-existing logics, as shown in figure 6 below.

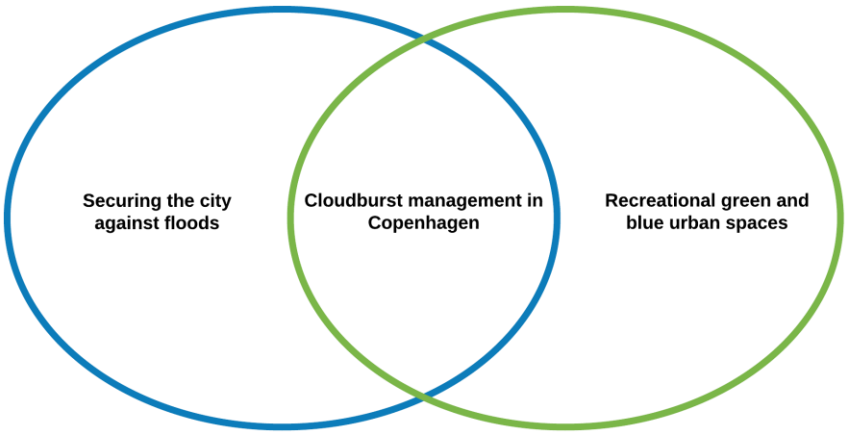

Figure 6. Visualization of the ambition for the cloudburst management of Copenhagen, as derived from two different societal needs (Own visualization).

As institutional complexities emerge in situations where different perceptions collide, the variety of potentially contradictory logics in Strandboulevarden may indeed generate such complexities. Especially, due to the lack of urban space funds, which heavily delimits the influence of the urban space logic. It is these complexities that the practitioners within the project must deal with, balancing and navigating the different needs, demands and perspectives, which these co-existing logics encompass.

These institutional complexities are likely to emerge as a result of structural overlaps, where individual roles and organizational structures and functions - that were previously distinct - are forced into association. An example thereof is mergers and acquisitions (Thornton and Ocasio, 2017). Such

structural overlap across systems with differentiated logics creates contradiction in organizations and organizational fields, generating opportunities for institutional change (Thornton and Ocasio, 2017). Furthermore, they can also potentially lead to the clashes between different professional logics, which is certainly not irrelevant. An example of such a structural overlap in this project's context is the collaboration between HOFOR and the municipality, resulting from the Cloudburst Management Plan (Københavns Kommune, 2012). Through this collaboration, previously distinct responsibilities and agendas were forced into association. This has indeed changed the climate adaptation process and practices through the substantial paradigm shift of integrating climate adaptation in surface solutions and possibly created friction between different logics (Steffensen, pers. comm.).

According to Reay and Hinings (2005, cited in Thornton and Ocasio, 2008), the organizational field can be thought of as a battlefield where competing institutional logics engage in numerous power struggles. In Strandboulevarden, one can clearly see tensions between the different prescriptions of the 'good' solution, namely the urban space, water management and financial logic, where the logic of water management seems to be given predominance due the absence of urban space funds. This implies not only that several logics co-exist, but further that they compete over issue interpretation. In other words, the lack of urban space funds restricts the extent to which the urban space logic gets to influence the course of action, as the solution must be 'hydraulically founded'. Thus, Design or recreational use argumentations are not considered valid as the project funding solely allow to pay for water management aspects (see Chapter 4.3.3).

Nevertheless, contradictions between different institutional logics provide the basis for individuals, groups, and organizations with cultural resources to transform individual identities, organizations, and society (Thornton and Ocasio, 2008). Thornton and Ocasio (2008) emphasize that competing logics cannot be seen as an explanation for change in institutional logics on their own, but as a precursor or a consequence. In this research, focus is on situations of institutional complexity, where frictions between co-existing logics are encountered. These situations are seen as precursors to change, as the practitioners facing the institutional complexity seek to minimize or deconstruct the frictions.

2.3.3 Navigating the Institutional Complexities of Cloudburst Management

One major contribution of institutional logics to institutional theory is the ability to explain institutional change and agency. Berg Johansen and Waldorf (2015) argue that because individual actors cannot readily reconcile the different logics, they must creatively find solutions to the friction that is created between co-existing logics (Berg Johansen and Waldorff, 2015). Although certain logics might prevail, such as the water management logic in the case of Strandboulevarden, dominant and subsidiary norms can co-exist and specific incidents may occur where subsidiary norms prevail (Thornton and Ocasio, 2008). Individuals might not only belong to one logic, but in specific contexts individuals may strategically import and export elements of various institutional logics (Grenier and Bernardini-Perinciolo 2016; Thornton and Ocasio, 2008). This essential for the scope of research and thus to investigate in the case of Strandboulevarden. How do the practitioners manage to utilize different logics and reduce friction in between, aiming to create the 'good' solution? In that regard, Grenier and Bernardini-Perinciolo (2016) state the following:

"*They* [Individuals] *do not just reproduce their logics or integrate new logics, but either adapt them*

to local contexts or are able to give predominance to one or the other logics according to the stakeholders they work with or depend on."
(Grenier and Bernardini-Perinciolo, 2016 p. 111)

This suggest that practitioners within the cloudburst project of Strandboulevarden can adapt the different logics and utilize them according to the given situation. Basically, this could mean that practitioners within the project could use elements from another logic than the one they originally adhere to, in order to justify a course of action that also benefit their agenda. An example could be to argue for recreational elements by justifying for their technical purpose, e.g. to incorporate a sitting edge into the solution by framing it as a basin edge for the retention basin (as elaborated in Chapter 6.3).

This implies that conflicts are not the only way that logics can co-exist. It is possible that a sort of sustainable combination can be achieved. A 'sustainable hybridity', however, seems easier to accomplish in projects where urban space funds are allocated, where the friction between the logics are lower. This sustainable combination requires that conflicts and tensions that emerge in situations of institutional complexity are handled. One possible way to reduce friction is to develop co-dependency relations (Grenier and Bernardini-Perinciolo, 2016). Regarding cloudburst management as it is in Copenhagen, one example of a co-dependency relation is the essential collaboration between the municipality and utility company that - given their respectively responsibility of urban planning and water management - must collaborate when doing surface solution, thus creating a structural overlap through bringing together different perspectives and, hence, different logics (Chapter 1, Introduction).

In an investigation of institutional complexity in healthcare, Blomgren and Waks (2015) suggest that the navigating work of professionals at the intersection of competing logics produces 'hybrid professionals' (Blomgren and Waks, 2015 cited in Smets et al., 2017). This suggests professionals that utilize and adhere to multiple professional logics. They furthermore argue, that this new identity actually springs from the daily practices and is, furthermore, institutionally embedded (Smets et al., 2017).

Concludingly, this suggests that the utilization, or the integration of other logics, is not a must, but a tool used to act in different situations with different stakeholders, drawing on different perspectives and knowledges connected to the different logics. A Practice Driven Institutionalism (PDI) approach with focus on institutional logics, offers a powerful conceptual toolkit to understand those settings in which conflicting prescriptions collide in everyday operations, and institutional complexity must be managed continuously (Smets et al., 2017).

2.4 Explaining Agency through Practice-Driven Institutionalism (PDI)

In recent years, there has been an increasing consensus between institutional and practice theorists, that they can learn from one another (Smets et al., 2017). Smets et al. (2017) argue that this dialogue and consensus has led to Practice-Driven Institutionalism (PDI). Here, institutionalists seek to enhance their understanding of how institutions play out on the surface of everyday life practices (ibid.). With this orientation, institutionalists can develop a more accurate and crude understanding of the institutional logics that are present in everyday practices (ibid.). PDI can further an understanding of how practitioners react to different institutional logics through their everyday activities (ibid.). PDI is

thus utilized in this thesis to analyze practitioner's response and utilization of different institutional logics within the project of Strandboulevarden.

2.4.1 PDI and Institutional Logics

Mostly institutional scholars have attended to pairs of logics and predominantly portrayed them in binary fashion, where they have been deemed either compatible or contradictory. However, things seldom make sense when considered in isolation and they should therefore be considered in a dynamic interplay (Smets et al., 2017). In understanding the institutional complexity that occurs when co-existing institutional logics are deemed contradicting, PDI can be helpful. When viewing the institutional complexity or the connected paradoxes from a practice perspective, institutional complexity is not encountered, but more often constructed (Smets et al., 2017). Following this line of thought, PDI deviates from the thought that certain logics are per se compatible or conflicting. Rather, PDI argues that the logics are constructed as being compatible or conflicting through practitioners' practice (Smets et al., 2017). This would mean that the logics of water management and urban space not necessarily are contradicting per se, but rather perceived or constructed as being contradicting. In this line of thought, the construction and deconstruction of institutional complexity becomes a central element of this research. By shedding light on these constructions, this research can potentially unravel maneuvers which practitioners deliberately can deploy to reduce the complexity.

Notably, according to Smets et al. (2017), the key question to address in order to demonstrate the power of logics is the questions of how these rules and principles are materialized in people's everyday lives (Smets et al., 2017). If organizations are conceptualized as interrelated and interdependent bundles of practices, changing one practice may have potentially significant consequences for other practices within the same social space (Smets et al., 2017). Logics, practices and activities mutually constitutes each other. This implies the need to investigate both the logics that provide meaning and the activities in which they are represented (Smets et al., 2017). In Smets et al. (2017) this is exemplified through the pounding of a nail which, in isolation, might seem mundane and trivial. The point is though, that it has a broader meaning in the practice of professional carpentry as belonging to a logic of craft (Smets et al., 2017).

As such daily activities and practices in connection to cloudburst management projects in CKT might seem mundane and trivial but have a greater meaning in practice of cloudburst management. Furthermore, the mundane practices of the practitioners might actually have a greater influence on the overall frames and results (Smets et al., 2017).

2.5.2 Changing Cloudburst Management Practices and Institutions with PDI

PDI locates the origin of institutional change in practices, as mundane completion of everyday work in which the practitioners stumble upon novel complexities and may develop the need, as well as the destination, for change (Smets et al., 2017). As such, practitioners involved with Strandboulevarden have stumbled upon new complexities given the fact that it is a solely utility funded cloudburst project. This, as expressed in the Introduction (Chapter 1), calls for a new practice or model for how to take on these kinds of projects. This is specifically described in the description of the project task in the project program:

"*Strandboulevarden will be one of the first cloudburst projects in Copenhagen Municipality, which is financed solely on utility funds. This means without allocated tax funds for urban space purposes that does not have a hydraulic purpose. Hence, the project can become a model for a necessary type of urban space i Copenhagen in connection to the implementation of Copenhagen Municipality's Cloudburst Management Plan"*

(CKT, 2018, p. 7, own translation)

It is important to note that practitioners are primarily not individuals as such, but embodiments of practice, hence those doing the practice. Therefore, the focus is more on the collective efforts as part of a recognized practice, and not on individual characteristics, skills and interests (Smets et al., 2017). The majority of people do not set out to affect the institutional arrangement that surround them, but they set out to cope with the practical demands of the situation they find themselves in (Smets et al., 2017). As such, practitioners from CKT do not necessarily actively seek out to change the overall frames for cloudburst management but given situations of novel complexities such as the lack of urban space funds instigates, they seek to solve the problems that these over institutional arrangements impose on their everyday work.

This, however, does not mean that practical coping with novel complexities may not have institutional consequence. One of the main points of PDI, is that these activities set out by the practitioners, actually can have institutional reverberations (Smets et al., 2017). Still, the institutional consequences of everyday navigation of structures and demands is not the practitioners' primary interest and focus of agency (ibid.). It is doubtful that practitioners from CKT deliberately seek out to change the overall institutional frames in their everyday work or expect that it will influence or change these frames. They are possibly more concerned about carrying out their tasks, and in the case of Strandboulevarden, develop a project that suits the established frames. The day-to-day work is quite trivial, but it can have consequences on a higher level. In this sense, the mundanity of everyday work is by no means trivial (ibid.). It becomes the source of the earliest instance of change. The start of macro-social change is always endogenous and emerges from and is inherent to practice. Here people invent, slip into, or learn new ways of interpreting and experiencing the world (ibid.).

This is highly relevant in the case of Strandboulevarden, where planners - as the practitioners - stumble upon institutional complexities in the form of a new type of cloudburst projects and its rigid financial frames that depicts a water technical prioritization. The practitioners can no longer solely depend on their everyday practice but must adapt to the new situation. It is how they adapt and what they utilize in order to adapt, that becomes interesting and a target of analysis.

There is though little information on how actors move from awareness to action. Former studies on institutional change have used planned change in situations where actors encounter a new institutional arrangement and actively pursue to adopt it (Smets et al., 2017). This has been criticized for failing to consider the process through which new complexities are experienced and responses developed (ibid.). This is especially experienced when more novel complexities arise and expose inadequate institutional arrangements, without offering a ready alternative, such as in the case of Strandboulevarden (ibid.). By using a practice-theoretical approach it is possible to address blind spots that are connected to the former. It is then possible to identify some points of interest within the project of Strandboulevarden.

Using emergence and continuous change, allows, first of all, to attend to the earliest moments of new practices emerging and taking shape (Smets et al., 2017). Considering the wish for developing

a model, practices or suggestions for future cloudburst projects similar to Strandboulevarden, this seems highly relevant. In doing so, institutional researchers can develop a greater understanding of the improvisations and experimentations through which new solutions are discovered, and the agency through which they come (Smets et al., 2017). This is extremely relevant in Strandboulevarden. In order to provide CKT with suggestions for future similar projects, this thesis is specifically on the lookout for these improvisations and experimentation that the practitioners within the project utilize in the development towards the 'good' solution. These improvisations and experimentations do not happen entirely accidentally, neither are they composed by a planned strategy of institutional design. They are implicitly coordinated by communities of practice (ibid.).

PDI make use of peoples' practical understanding, which is their personal feel for how to perform in complex situations in which logics collide. Practice theorists offer a balanced view in which a logic is complemented by a practical understanding. This practical understanding enables individuals to navigate situations by *"guiding the appropriateness of specific actions in any given context or situation"* (Smets et al., 2017, p.6). This entails as Smets et al. (2017) explain it:

> *"...a richer interest in practitioners, neither as mere embodiments of practice, nor as disembedded individuals, but as skilled performers with institutional biographies and concomitant identities."*
>
> (Smets et al., 2017 p. 16)

The different practitioners within the project of Strandboulevarden utilize their practical understanding in order to navigate the complexity that the frames for the project entails. These practical understandings might be related back to the occupational communities, described earlier. Each occupational community represents different practical understandings and thus different interpretations of the good solution. As skilled practitioners they utilize their professional logics or multiple professional logics in the shaping of choices. PDI's sensitivity to the practical origins of complexity, contribute to a greater understanding of how organizations face institutional complexity, but also how they can manage constellations of two or more co-existing logics (Smets et al., 2017). As example is the use of language and situational cues which can be utilized in order to switch between logics in order to promote different discourses (ibid.). This could be the use of water technical language in the argumentation for a recreational element in a cloudburst solution, which as we will see in the analyses, is of crucial importance in the case of Strandboulevarden.

In the same way as, institutional logics are enacted in practice, their incompatibilities are problematized in practitioners' everyday work. One major argument for taking a PDI approach in this thesis, is its emphasis on the practice-level actions and interactions of practitioners, which suggest that it is particularly suitable for connecting practitioners, organizational and institutional levels of analysis (Smets et al., 2017). This thus brings us back to the society that consist of three levels; practitioners, organizations and institutions. Reflecting on the different levels explained earlier, the dynamic between organization and individual is important. Organizations can function as a kind of filter of institutional logics for its individual members. The organizations can enhance the influence of field level logics on individuals or buffer individuals from field level logics (ibid.). One could then argue that the whole organization of Copenhagen Municipality, with the lack of urban space funds buffer the practitioners within the project of Strandboulevarden from an urban space logic and, furthermore, actually enhance a water management logic, since the focus is on handling the rainwater.

In conclusion, PDI offers the conceptual toolkit to take the role of individuals as carriers of institutions seriously. Furthermore, it offers concepts to discover how the individuals experience institutional complexity as a part of their ordinary, everyday nature of work, rather an exceptional phenomenon (Smets et al., 2017). Hence, the primary unit of analysis in this thesis is not the institutions, nor the organizational fields which enable and dictate organizational and individual behavior, but instead, the everyday practices of practitioners in which rules and principles (logics) materialize (ibid.). This is not to say that institutions and organizational fields are disregarded, but that they are conceptualized through the purview that they constitute for the everyday practice of practitioners, more specifically, in the case of Strandboulevarden. As such, the purpose is not solely to understand how the institutional frames guide everyday practice, but also to reflect upon the influence of the seemingly mundane materialization of practices on institutional change (ibid.). But first of all, the theoretical foundation must be established.

3. Methodology

This chapter introduces the methodological framework applied in this thesis as well as the considerations behind the research approach. First, the chapter will account for the science-theoretical basis of the thesis, which has had a large influence on how the research is conducted. Secondly, the research design will be presented. This is followed by a presentation and justification of the chosen case study, applied qualitative methods, collected empirical data and the processing of data.

3.1 Conducting Applied Research

Public and private institutions more and more frequently call for social scientists and other analysts to apply their research skills to assist in tackling real-world problems; the requests being extremely varied (Hedrick et al., 1993). As Sustainable Cities Engineers, the project group of this thesis seeks to assist in solving real-world, contemporary challenges related to sustainable urban development. The objective being to produce knowledge about the social, technical and material aspects of the messy urban reality and to transform this knowledge into credible statements, which can help press for a more sustainable development. More specifically, this research works within the context of climate change adaptation, which represents a complex sustainability challenge. By looking at the matters of concern from a distance, this thesis can hopefully provide novel insights that are hard to come by when entrenched in the daily routines. In the following, the iterative process of scoping in towards the matter of concern is elaborated.

According to Bickman and Rog (2009), the first stage of a research process entails developing an understanding of the relevant problem or societal issue at hand. Two of the three researchers of this thesis are student assistants at the Technical and Environmental Administration (referred to as *Teknik og Miljøforvaltningen* - TMF) within Copenhagen Municipality. Hence, the project group had firsthand insight into the municipality as an organism and contemporary matters of concern. This enabled a close collaboration with practitioners from the Center for Climate Adaptation (referred to as *Center for Klimatilpasning* - CKT) who helped to refine and revise a relevant issue to research, within the conditions set by this thesis (e.g. timeframe, resources and context). Hence, the research has the potential of providing useful information for the future work of CKT. However, it is important to emphasize that despite the research seeks to tackle a problem within the field, it simultaneously preserves and deploy a critical and academic research scope.

Developing the scope of study was an iterative process, during which, the design was developed, data collection approaches chosen, the feasibility of executing the proposed approach assessed, and trade-offs weighted (Bickman and Rog, 2009). During this process, the research question, theoretical scope and research structure were revised numerous times as the research team gained a better understanding of the problem field, the chosen theories and the scope of research (as shown in figure 7).

Figure 7. Visualization showing the iterative process taken by the research team (own visualization).

3.2 Research Design

In order to ensure an accurate and unequivocal answer to the research question, the process has been structured by a research design. The design serves as the architectural blueprint of a research project, linking design, data collection, and analysis activities to the research question and its sub-questions, as well as ensuring that the complete research agenda is addressed (Bickman and Rog, 2009). As Bickman and Rog (2009) state, a research study's credibility, usefulness, and feasibility reside within the design that is carried out - all of which are necessary to conduct high-quality research.

Credibility entails that the design is sufficiently stringent to adequately support the conclusions and recommendations of the research, hence referring to the validity of the study (Bickman and Rog, 2009). Credibility is also, in part, determined by who is making the judgement and determined by the research question. According to Newman (2014), qualitative research makes the researcher interpret the obtained data by 'knowing' the viewer and their point of view about a particular subject. This emphasizes subjectivity (de Vaus, 2001), which is why the researchers have considered their impact on the results, referred to as bias. In effect, with two of the researches working at student assistants at CKT, one could argue that they are biased through their indoctrination into the organization. Thus, this research has strived for objectivity through acting in 'good faith' by making impartial abstractions and claims, though accepting that complete objectivity within social research is impossible to reach (Bryman, 2008).

Usefulness refers to whether the design is appropriately targeted to answer the specific questions of interest (Bickman and Rog, 2009). The usefulness of this study is addressed through close communication with the field.

Lastly, *feasibility* suggests that the research design must be achievable, given the time and other resource constraints (Bickman and Rog, 2009). Feasibility concerns the assessment of whether conducting the study within the given time frame and the resources available is reasonable. In that regard, the project group was bound to take into consideration a series of trade-offs. Trade-offs in the type of design that could be employed, the data collection methods that were to be implemented, the size and nature of the sample to be considered, as well as other planning decisions, including not least, the likelihood of being given access to certain documents (Bickman and Rog, 2009). This will be further expanded through this chapter.

In the following, the research design employed for this thesis is presented (see Figure 8 for a visualization).

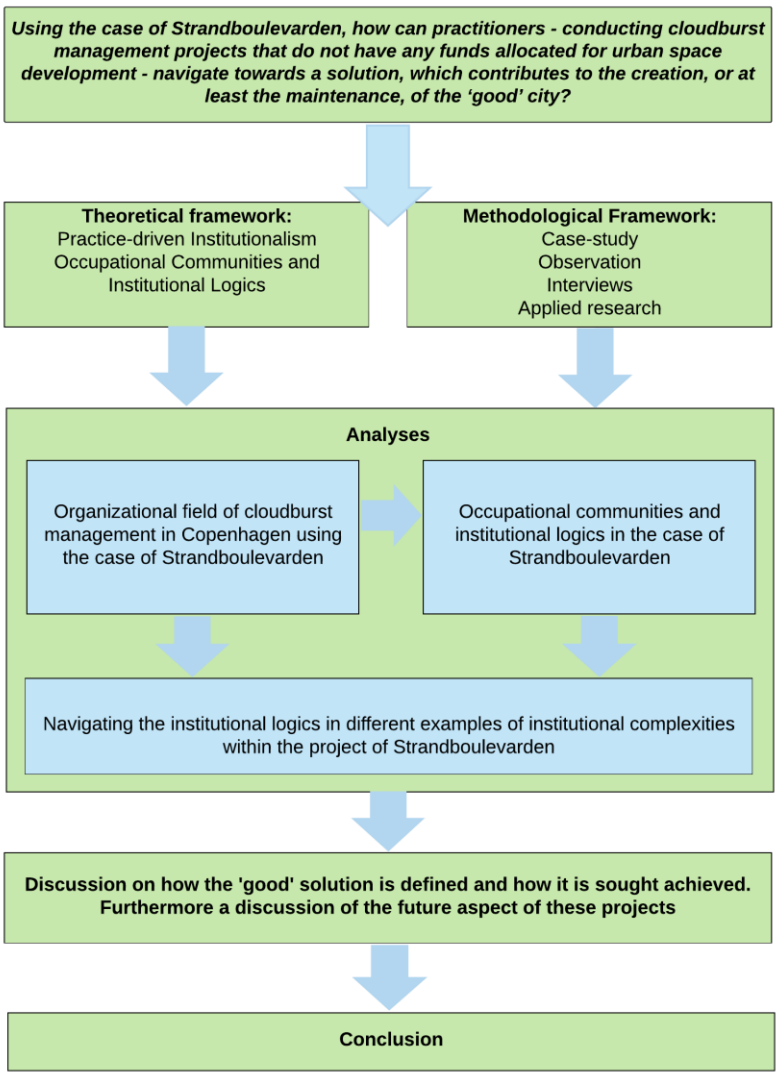

Figure 8. Visualization of the research design for answering the research question (own visualization).

As described in the Introduction (Chapter 1), projects such as Strandboulevarden are influenced by several organizational and institutional frames as well as by the actions of planners and other involved practitioners. To understand the inherent dynamics and courses of action, one needs to unravel the socio-material context. In the following, the overall approach for this unraveling is presented.

This research deploys an in-depth case study as its' strength lies in a deeper understanding of concrete contextual knowledge and the matter of concern - as an understanding of inherent dynamics necessitates (de Vaus, 2001). This is especially the case in the project of climate adapting Strandboulevarden as the research team had a good entry point into the case as well as active guidance from the field itself.

Firstly, the organizational field of cloudburst management in Copenhagen is analyzed and exemplified by using the case of Strandboulevarden. This is done by making an in-depth document analysis of documents and plans related to cloudburst management in Copenhagen and the specific project of Strandboulevarden and, furthermore, through conducting qualitative interviews with relevant practitioners within the organizational field. Notably, this research takes an follow-the-actors approach to the unveiling of the organizational field and its' influence on the project. Therefore, light

is solely shed on the constituents and relations within the organizational field that the practitioners, their actions and deliverances express.

Secondly, institutional logics are identified by looking at the occupational communities present within the project of Strandboulevarden. These occupational communities are unveiled through qualitative interviews with involved practitioners. By looking into the occupational communities, different perspectives, values and ambitions in relation to defining the 'good' solution become apparent. However, the institutional logics are not solely derived from these occupational communities, but also from more general influences which shape their actions. This is further sought uncovered through qualitative interviews with practitioners within the field, document-analysis of significant frames and by observing parts of the process.

Thirdly, the everyday practice of practitioners is analyzed in situations of institutional complexities, where co-existing logics seem to collide. Thus, examples that appear particularly potent are chosen for a more in-depth description of the activities and the influential factors. The examples are chosen and based of challenges expressed through qualitative interviews, participant observations and documents from the Strandboulevarden project.

The tree analyses establish the foundation for discussing and reflecting upon how the 'good' solution is defined through the practitioners' everyday navigations. Indeed, this involves not only a reflection of how practitioners navigate in the quest for the 'good' solution, but also what the 'good' solution entails. Moreover, it entails a discussion of whether Copenhagen should continue this model for Cloudburst management.

3.3 Qualitative Research

To avoid that the theoretical concepts from Practice Driven Institutionalism used in this research remain merely theoretical, the research team strives to transform them into some measurable variables of some sort (Harvey, 2017). Jonker and Pennink (2010) explain how operationalization entails describing the process of selecting social phenomena as indicators of social concepts and applying theories to it. Accordingly, to operationalize the theories, empirical data had to be collected and analysed. For this thesis, a qualitative approach was chosen for the data collection, since this indicates a detailed investigation of the social and cultural processes at play (Newman, 2014).

According to Harboe (2006), when using case-studies the selection of methods must include methods that are more flexible with regards to nuances and individual situations, and therefore qualitative methods become relevant due to their inquiring and exploratory form (Harboe, 2006). In general, qualitative studies involve a relatively small number of participants as qualitative research seeks to convey people's thoughts and feelings (Shelton et al., 2014). Through developing an in-depth picture, the researchers try to understand the meaning that people ascribe to their experiences and behaviors (ibid.). This very perspective is essential for this the research, where the focus is on how institutional logics are materialized through the practitioners' everyday actions, necessitating an in-depth knowledge about their activities and influences thereon.

3.3.1 Case Study of the Strandboulevarden Project

As Bickman and Rog (2009) explain, it is difficult for the researcher to study all people, all locations, or all time periods relevant to the problem in focus. Sampling is a well-known term within social research and allows the researcher to study only a subset of the units of interest and then generalize to all these units with a specifiable degree of error (ibid.). It offers benefits in the form of reducing the resources necessary to do a study and permits more intensive scrutiny by allowing the researchers to concentrate on fewer cases (ibid.). To be able to answer the research question of this study, an in-depth understanding is paramount, which is why a case-study approach was chosen.

The case of Strandboulevarden constitutes the first larger cloudburst management project within an urban space, where urban space funds have not been allocated. Given the research question of this thesis, naturally the practical justification of using Strandboulevarden as the case to study is self-explanatory. Its relevance resides, however, in the probability of future projects working under similar conditions, which, due to the changed political and financial circumstances, seems likely (Hansen, pers. comm.; Hede, pers. comm.; Steffensen, pers. comm.). The academic justification, which is interrelated to the practical, is based on the novelty of practitioners facing this type of institutional complexity. It is through the 'mundane' everyday work of practitioners which seek to navigate this complexity that changes in practices and institutions emerge (Smets et al., 2017). Thus, emphasizing an analysis of the practices and activities in which these navigations occur. The Strandboulevarden project provides this setting as it is an ongoing project where the researchers can observe some of these activities. Furthermore, as the theoretical framework emphasizes the relevance of impeding conditions and normative reasons behind action, it is an advantage that the interviewees have the process fresh in mind.

By providing a detailed description, or 'thick description' of the socio-material context on which the findings of this report are based, the foundation for others to make judgements regarding the transferability of results is provided (Bryman, 2008)

A delimitation of the case-study is, however, that not all constituents and dynamics of the organizational field are taken into account due to considerations of the time-limitation and scope of research. The delimitations are based on a 'follow-the-actor' approach where solely constituents and dynamics that are contributed significance through the empirical data (mainly interviews) are included (Latour, 2007; Ryding, 2012). In this regard, it is important to mention that the political 'game' behind approving urban space funds and project proposals are not considered as the scope of research is concerned with the consequences of their decisions and not the reasons behind. Furthermore, citizens involvement and the occupational community of traffic engineering are not directly included and, thus solely included to the extent mentioned in the empirical data. The main focal point of the case study to investigate is the interrelation between financial, water management and urban space aspects, as defined in Chapter 5.

3.3.2 Data Collection

The empirical data which constitutes the foundation for this thesis is derived from three different sources, namely; semi-structured interviews, document analysis and participant observation. As the scope of research revolves around action and the influences thereof, multiple data sources increases the reliability (Bryman, 2009). Stated facts and actions can thus be qualified by relating them to observed action and material facts.

Semi-structured Interviews and the Selection of Interviewees

As a part of the data and knowledge collection, several interviews have been conducted with different professionals from Copenhagen Municipality and relevant consultants. The purpose of the interviews was different depending on who was interviewed, but the overall objective was to obtain in-depth knowledge about how the involved practitioners navigate the complexities in the project of Strandboulevarden.

The selection of interviewees can be described as an iterative process. As described earlier, the thesis made use of a 'follow-the-actor' approach in identifying important actors within the project. Furthermore, due to the inside access to practitioners within the Technical and Environmental Administration, the identification of relevant actors was relatively straight forward. The interviewees were chosen due to their knowledge, role and involvement in the case of Strandboulevarden. More specifically, the choice of interviewees sought to cover aspects from the early stages of the project and the overall institutional and organizational frames, to the contemporary project related events and activities. As the scope of research focus on the latter, most interviewees were chosen as representatives of the different organizations, actors and especially, occupational communities involved in this phase.

Table 2 gives a quick overview over the interviews conducted. The table includes the interviewees organization, their role and the date where the interview was conducted. It is organized chronologically with regards to the development of the Strandboulevarden project. One should note that, despite numerous attempts, it was unfortunately impossible to get an interview with the utility company, HOFOR. Yet, their role is still being discussed to the degree that the empirical data allows.

Table 2, overview of interviewees and interview date. The interviewees did not wish to be anonymous.

Organization and role	Name of interviewee	Date
CKT (BF)	Anne Hansen	12. April
CKT (BU)	Aske Steffensen	8. April
CKT- Project coordinator in earlier process	Line Ørsnes	3. Maj
CKT - Project coordinator	Thor Bjørneboe	4. April
CKT - Water specialist	Matias Hede	4. April
CKT - Architect specialist	Rosalina Wenningsted-Torgard	8. April
Orbicon - Water specialist	Jens Toke	10. April
BOGL - Landscape architect	Linda Due Schmidt	8. April
Local Committee Østerbro	Axel Thrige Laursen	6. May

All interviews were conducted in-person and have been recorded after asking for permission. Quotes and statements from the interviews used in the report were all sent to and approved by the interviewees. The interviews were conducted in a semi-structured manner, as this allows for an adaptation to each stakeholder's profile, a freedom of expression and a development of responses for a better understanding of the interviewee's perspective and situation (Cohen and Crabtree, 2006). To increase the validity, the semi-structured interviews were conducted based on interview guides composed of a list of questions sorted by theme and continuity yet allowing the order to change during the interview if the conversation asked for it (ibid.). Before the interview, the interviewee was made aware of the scope of research and the topics which would frame the interview. In Table 3, a brief description of each interview's purpose is presented, in alphabetical order.

Table 3. Presenting of interviewees and their respective relevance and contribution in connection to the thesis.

Interviewee	Background, position and profession	Relevance and contribution
Anne Hansen - CKT	Hansen is a construction architect by profession and has experience working with water management projects from the private sector. Water has always been an add-on to her professional knowledge. She currently works with cloudburst projects in CKT. Before CKT, Hansen worked with the development of these co-finance cloudburst projects.	Hansen was a part of the project of Strandboulevarden in its earlier days and helped create the foundation and framework on which the program of the project was set. She helped mature the project in the earlier stages before it was sent to be implemented as a construction project. Furthermore, as an architect she provided knowledge about urban space perspectives within the project.
Aske Steffensen - CKT	Steffensen is an environmental planner, having focused on climate adaptation in Copenhagen since his Masters. He is currently working at CKT as the responsible of Østerbro water catchment area.	Before the formation CKT, Steffensen was a main actor in the development of the Copenhagen Cloudburst Management Plan and is thus a central character for understanding the strategic development of the cloudburst management, which have affected the project of Strandboulevarden. Furthermore, his Master thesis (Steffensen, 2014) which focuses on the cloudburst management system in Copenhagen has provided great inspiration to this thesis.
Axel Thrige Laursen - Østerbro Lokaludvalg	Laursen is a retired City planner, formerly employed in the Environmental Ministry. He is currently chairman of the Technical Committee for Urban Planning, Technology and the Environment in the Local Committee of Østerbro.	Laursen provided great inside knowledge about the different initiative taken from a local perspective regarding a refurbishment of Strandboulevarden. He has great knowledge about the past as well as the present citizens engagement processes and work done by the Local Committee for the visions for Strandboulevarden.
Jens Toke - Orbicon	Toke is an Environmental Engineer in urban water. He works for the consultancy firm Orbicon where he primarily makes hydraulic models.	Toke is responsible for making the hydraulic models needed for accessing the water technical aspect of the project Strandboulevarden. He is interviewed as the representative of the perspectives of Orbicon, who are responsible for the technical aspects in the project with focus on

		achieving the hydraulic requirements.
Linda Due Schmidt - BOGL	Schmidt is a landscape architect and project coordinator at the landscape architect firm BOGL.	Schmidt is interviewed as the representative from BOGL, which is the main consultant on the Strandboulevard project. Their task is to ensure that the project results in an urban space of some character within the given constraints of the project. Schmidt is interviewed with regards to getting a better understanding of how they deal with this challenge and furthermore provide knowledge about the urban space perspectives.
Line Ørsnes - CKT	Ørsnes is an architect working in CKT	Ørsnes was the first project manager for the Strandboulevarden project, overseeing the writing of the program based on the analyses received by the first consultancy firms, SLA, Niras and VIATRAFIK. Ørsnes provided knowledge about the former process of Strandboulevarden and urban space perspectives in the project.
Mathias Hede - CKT	Hede is an Environmental Engineer in urban water. He works as a water expert in CKT where he advises about the hydraulic aspects of cloudburst projects.	Hede is a part of the project group in Strandboulevarden, where he takes an adviser approach on how to perform the planning task at hand. Hede serves as the mediator of the water perspective and a translator of the technical premises that HOFOR and Orbicon present during project group meetings, being a key advisor for both his colleagues from CKT and the landscape architects from BOGL.
Rosalina Wenningsted-Torgard - CKT	Torgard is an architect in CKT, working as a development project manager. She is currently working primarily with the new masterplans that CKT has initiated.	Torgard has been an important figure in the development of the Program for Strandboulevarden where she focused on the urban space perspectives. She is currently involved in the project group where she provides important urban space perspectives in the development.
Thor Bjørneboe - CKT	Bjørneboe is a landscape architect working as a project manager in CKT. Has been in several units in within the municipality but has mainly worked as project manager in construction projects.	Bjørneboe is project manager for Strandboulevarden, responsible for keeping the project on track, approving what can be financed and what cannot. He is the main contact point between the municipality, HOFOR and the consultant firms. Bjørneboe was thus interviewed to gain better understanding of the managerial and coordinational aspects of the Strandboulevarden project, and to shed light on CKT's attitudes towards there being no urban space funds available.

As previously mentioned, no interview with HOFOR was conducted as all three HOFOR employees contacted responded that they did not have time to conduct an interview. HOFOR plays a crucial role in this project (as elaborated in Chapter 4) and an interview would have shed light on aspects such as how they view the 'good' solution as well as the synergies which are thought of between the Strandboulevarden project and the cloudburst tunnel. Thus, HOFOR is only described to the extent

that the empirical data allows. The data being derived from other interviews as well as through a document analysis of relevant materials submitted by HOFOR such as the "Application for Co-finance projects in Østerbro" (HOFOR, 2015). Of course, more in depth knowledge in the form of actual interviews would have improved the credibility and quality of the findings of this thesis.

Interview guides

Given the scope of research and the matter of concern sought addressed, the interviews were guided by a set of themes and questions. This 'script' or interview guide was composed of open-ended questions to get more complete answers and to let the interviewees express themselves more freely as well as giving them the opportunity to talk about relevant matters beyond the interview guide (Cohen and Crabtree, 2006). Notably, the content of these scripts for the different interviews varies in their composure, but they do, however, share main traits (see Appendix A). These main traits concerned first of all obtaining an understanding of the project itself. What were the main events, which institutional frames are significant in defining the 'good' solution and who has been involved in the process? Besides unraveling the process and significant constituents and dynamics of the organizational field, these questions also supported the 'follow-the-actor' approach taken in this research by shedding light on influential actors and practitioners. A main theme of the scripts was the unraveling of occupational communities and practitioners' adherence to institutional logics. Questions in that regard revolved around the profession of the given practitioner, the role they play or played in the project, how they defined the 'good' solution and how they through different means and maneuvers sought to work towards that solution. Moreover, as the everyday practices and activities relating to tackling institutional complexity are central to the scope of research, the scripts also sought to unveil situations in which logics were perceived to collide and how different practitioners acted in those situations. An example hereof is whether the solution ought to be placed in one side or the other of the road. Lastly, questions regarding institutional change was included, to see if experiences made in Strandboulevarden had instigated such changes and to reflect upon the future practice of cloudburst management.

Participant Observations

With Strandboulevarden being an ongoing project, the research group had the opportunity to participate in three project group meetings where representatives from CKT, HOFOR and the consultant firms attended. These meetings were a part of the pre-analysis for the disposition proposal. As Kawulich (2005) argues, observation methods are useful in numerous ways, for instance, by providing researchers with ways to check for nonverbal expression of feelings, determine who interacts with whom and grasp how participants communicate with each other. In this regard, the researchers of this thesis merely participated as neutral observers who took note of the discussions. This allowed data to be collected regarding the actions of practitioners within the project group meetings, i.e. how they enacted different logics and how institutional frames influenced the discussion and actions. In doing so, emphasis was on the rhetorical tropes that practitioners from different occupational communities deployed, the cultural artifacts which they referred to as justification and whether the co-existing logics were conveyed as contradictory in certain situations.

As Schmuck (1997, cited in Kawulich, 2005) suggests, participant observation can be used as a way to increase the validity of the study, as observations may help the researcher have a better understanding of the context and phenomenon under study. In effect, these project group meetings gave the research group insights into some of the project specific discussions held about issues such

as the preliminary design drawings of how Strandboulevarden potentially could look once completed. The meetings, furthermore, provided the research group with a source of questions to be addressed during interviews. Once more, this was a unique opportunity given to the research team, since these are most often confidential meetings - usually difficult for students to be able to attend. It was also during these meetings, that some of the main documents to analyze were identified.

Document analysis

Document analysis is a form of qualitative research in which documents are interpreted by the researcher to give voice and meaning around an assessment topic (Bowen, 2009). It is a systematic procedure for reviewing or evaluating documents, printed and electronic material (ibid.). Like in other qualitative analyses, the document analysis requires the data to be examined and interpreted in order to produce meaning and develop empirical knowledge (ibid.). In this thesis, several documents has been used in order to carry out the needed analyses, since several documents relate to the project of Strandboulevarden and provide contextual knowledge about the project and the development of its frames. The following documents are considered relevant because they have been highlighted during the qualitative interviews with practitioners from the field and through the project group meetings and, furthermore, set to have a significant influence on the project. Moreover, the use of documents is, as previously mentioned, a mean to achieve data triangulation - where knowledge from important documents substantiates and supplements statements from the qualitative interviews and observations from the project group meetings. Table 4, gives an overview of the significant documents that have been analyzed and used in this report:

Table 4. Central documents used in the analyses

Titel and year	Author	Relevance
Program (2018)	CKT	The Program describes the project development of the cloudburst project on Strandboulevarden. It defines the Administration's requirements to the consultants and describes the purpose and goals of the project. As the Program is a central part of the procurement material given to the consultants, it gives an in-depth knowledge about the framing of the project of Strandboulevarden, especially relevant for this research.
Pre-analysis part 2 (2019)	BOGL and Orbicon	The report is a result of the consultants' further work with different scenarios for the solution on Strandboulevarden both regarding hydraulic function and urban space potentials. The report ends in two scenarios, one on the west side of the road and one to the east.
Copenhagen Cloudburst management plan (2012)	Copenhagen Municipality	This document outlines the methods, priorities, and measures recommended for the area of climate adaptation including extreme rainfall. The plan sets the overall vision of securing Copenhagen against floods through a combination of (blue/green) surface solutions and (grey infrastructure) pipes.
Feasibility study for Strandboulevarden (2016)	Niras, SLA, and Viatrafik.	The study analyzes three scenarios for a cloudburst solution on the surface of Strandboulevarden and the urban space potentials. The study was done assuming that urban space funds would be available in the project. It gives great insight into earlier scenarios and the different justifications for the different scenarios.

Climate and Investment Statement (2015)	Copenhagen Municipality	This document sets the direction and ambition for climate change adaptation in Copenhagen. Such a plan is developed every year, but the first one came in 2015 and started this method of implementing the cloudburst projects in Copenhagen.

Use of internal documents

Many of the documents have been obtained through the research group's close connection to CKT, suggesting that most of the documents are internal and hence not publicly available. There has been an ongoing dialogue with CKT about the use of certain documents and an approval has been granted to the use of specific documents as references in this thesis. These documents are, however, not attached to the publicly available report. Furthermore, political documents and decisions with major influence on the framing of the project of Strandboulevarden have also been used as references. These documents were retrieved on the publicly available website of Copenhagen municipality where all political decisions made by the City Council of the Technical and Environmental Committee can be found.

3.3.3 Processing of Data

The processing of empirical data was necessary to structure, both regarding its comprehensive nature and the ensurement of a methodologically stringent approach. In this regard, it was especially the interviews, which were the target of such efforts. In the following the guiding principles and measures taken are presented.

Transcription and coding of interviews

All interviews were transcribed using the audio recordings from the interviews. According to Rapley (2007, cited in Kvale, 2007) transcribing interviews from an oral to a written mode structures the interview conversations in a form amenable to closer analysis, and is in itself an initial analysis. As transcribing from tape to text involves a series of technical and interpretational issues – in particular, verbatim oral versus written style – for which there are few standard rules, but rather a series of choices to be made (Kvale, 2007). As there were three transcribers for the interviews of this study, care had to be taken so ensure that the same procedures for typing were used. As such, it was decided that pauses, emphases in intonation, and emotional expressions like laughter and sighing were not to be included in the transcription, both in order to limit the resources needed for transcribing and in order to streamline the process.

The coding of interviews is essential to structure the obtained information and extract important points. Coding serves as a way to organize the gained empirical data to be able to use these as a part of the analysis (Saldaña, 2009). By developing a mutually defined coding structure, the research group sought to increase the internal reliability, which regards minimizing the lack of consistency when subjective judgement is involved in translating data into categories (Bryman, 2008).

The categories are mainly derived from the theoretical framework which emphasizes the presence and manifestations of logics, but they also seek to encompass unanticipated empirical findings. The transcriptions were translated into the below presented categories by color coding the

text. This text analysis was initially conducted by single researchers, but subsequently qualified by a second researcher. Again to increase the internal reliability.

Yellow	Logics (professional development of the individual and the presence of other logics in the project and organization).
Orange	How a logic is manifested within the project, e.g. through a certain tactic.
Red	When several logics are used by a practitioner or when several logics complement each other.
Blue	Knowledge about the organizational structure and roles within CKT or the project of Strandboulevarden.
Purple	Regulations, policies, plans and tools
Green	Process, timeline events, important project decisions
Turquoise	Projects specific matters, such as the fact that Strandboulevarden should be able to handle 2000 m^3 water.

It is important to note that the filtering process which coding represents, is always a simplification of the obtained empirical data and therefore runs the risk of neglecting relevant data (Saldaña, 2009). As the transcriptions constitute the main empirical data on which the analyses are made, the categorized findings did not provide the sole input. When writing the analyses and the discussion, the researchers re-read the transcriptions in the search for neglected findings or wrongly categorized data. This was indeed necessary as the researchers at that point had a much better comprehension of the scope of research and matter of concern.

Translation of interviews

All interviews were conducted in Danish, being the native language of both participants and researchers in this study. Yet, the official language of this Master thesis is English, suggesting that all quotes have been translated into English. The research team is aware that language differences may have consequences, because concepts in one language may be understood differently in another language. As van Nes et al, (2010) argue, this is in particular relevant for qualitative research, which is based on words; where language is central in all phases ranging from data collection to analysis and representation of the textual data in the final report. Polkinghorne (2007, cited in van Nes et al, 2010) states, that qualitative research is considered valid when the distance between the meanings as experienced by the participants and the meanings as interpreted in the findings is as close as possible. Van Nes et al. (2010) further argue, that the findings should be communicated in such a way that the reader of the report understands the meaning as it was expressed in the findings, originating from data in the source language. Accordingly, the researchers of this project have strived to translate quotes and their associated meanings to English as closely as possible. Yet, translation of quotes poses specific challenges, because it may be difficult to translate concepts for which specific culturally bound words were used by the participants (ibid.). Accordingly, fluid descriptions of the quotes of participants are used, as these contribute to a sound understanding among the researchers of the concepts central to the research. Moreover, as previously described, the quotes and important

statements used in the report was sent to the interviewees for confirmation. The purpose being not only to confirm the allowance of using certain statements, but also to confirm that the interviewee was understood correctly, and that the translation still communicate the same message. Thus, providing respondent validity and reducing the risk for biased abstractions (Brinkmann and Tanggaard, 2010; Bryman, 2008).

The Use of Ideal Types to Identify Institutional Logics

In this thesis, institutional logics are, amongst others, defined on the basis of the values, ambitions and beliefs of occupational communities within the projects of Strandboulevarden. While a division of individuals into occupational communities with collective identities facilitates comparison between different institutional logics, the elemental categories of institutional logics are a coherent set as distinct from independent variables (Panhnke et al., 2015, cited in Ocasio et al., 2017). Accordingly, these occupational communities ought to be seen as 'ideal types', which are simplified, synthetic, analytical and abstract representations of institutional logics based on empirical observation (Ocasio et al., 2017). Originally developed by Weber (1978, cited in Ocasio et al., 2017) ideal types facilitates an abstraction from the complexity and specificity of concrete events, whereby the research can depart from reality and focus on certain attributes for analytical purposes. As such, within the institutional logics of architecture, specific characteristics might be perceived fundamentally different depending on which logic an individual adheres to. From an aesthetic logic, an architect might view a surface solution climate adaptation project as a site for artistic entrepreneurship, while from an efficiency logic's perspective; the source of identity might be architect as engineer-manager (Ocasio et al., 2017:24). Accordingly, competing logics might occur also within the same occupational community. This thesis acknowledges that in reality one cannot simplify the occupational communities as such, but from an analytical point of view it is an advantage to simplify them. Thus, the thesis make use of describing the occupational communities as ideal types in order to identify the inherent logics. Another important delimitation to consider, is the fact that only three occupational communities - and hence three main institutional logics are considered; water management, urban space and finance. This, however, does not mean that other occupational communities and logics are not at play. In effect, the occupational community of traffic is also a central actor in Strandboulevarden but has - given the focus specified in the research question - not been considered further in this study.

3.4 Analytical Framework

The following analyses are structured according to the very topics which the theory and research design addressed and are, furthermore, guided by the first three sub-research questions. In composite, they constitute the case-study analysis. They will be presented as follows:

- What constitutes the organizational field that the Strandboulevarden project is embedded within, and how does it influence the work towards the 'good' solution? (Chapter 4)
- How are different interpretations of the 'good' solution embedded within occupational communities and institutional logics? (Chapter 5)
- How do practitioners, through everyday activities, navigate the institutional complexities of the project? (Chapter 6)

4. Framing the Project of Strandboulevarden

In the following the case of Strandboulevarden will be presented by answering the sub-question of the thesis: *"What constitutes the organizational field that the Strandboulevarden project is embedded within, and how does it influence the work towards the 'good' solution?".* In Chapter 2 - Theory, the organizational field is described to comprise a multiplicity of actants, both human and non-human, which through a network of relations influence individual and organizational action (Chapter 2). Notably, this descriptive analysis solely unravels significant constituents for the project of Strandboulevarden, such as sources of funding, involved organizations and overarching frames. In doing so, this analysis simultaneously uncovers how the problem is defined and, to a limited extent, how its' resolution is framed.

In the following, the field constituents and their influence on the project of Strandboulevarden will be presented through firstly describing the overarching frames for the project in relation to the overall cloudburst management efforts. Secondly, the former process, which has an influence on present frames is described where after the more context specific constituents are unraveled. Lastly, the different organizations and actors involved are presented.

4.1 Strandboulevarden - an Important Piece of the Cloudburst Management Puzzle

As described in the Introduction (Chapter 1), the Copenhagen Cloudburst Management Plan from 2012 sets the overall frame for the cloudburst management endeavor. The plan sets the overall solution principle for cloudburst management in the form of a combination of surface (green/blue) and subsurface (grey) infrastructures (Københavns Kommune, 2012). Moreover, the Cloudburst Management Plan sets a service target which the infrastructure must live up to. The service target being that a maximum of 10 cm water is allowed to accumulate in the divide between public and private space in the event of a 100-year event (ibid.). The ambition as stated in the Cloudburst Management Plan, is that all surface water should be handled through the proposed infrastructure, i.e. both cloudburst water and everyday rain, to avoid costly implementation of separate sewer systems (where rainwater goes in one pipe and wastewater in another) (ibid.).

In the 'Climate Change Adaptation and Investment Statement' from 2015, 300 cloudbursts projects are presented as the resolution to the Cloudburst Management Plan in Copenhagen municipality. These projects constitute the overall frame that Copenhagen municipality can report to the Utility Secretariat to be able to finance them over utility funds (Steffensen, pers. comm.). A description of the Utility Secretariat and its function is described later in this chapter (see Chapter 4.4). The projects are distributed across seven major water catchment areas (see Figure 9), described as hydrologically cohesive areas that through terrain modifications provide good opportunities for handling the water on surfaces and through diversion to recipient in the form of the lakes and harbor (Københavns Kommune, 2015c). The project of Strandboulevarden is located in the urban district and catchment area of Østerbro, highlighted in Figure 9.

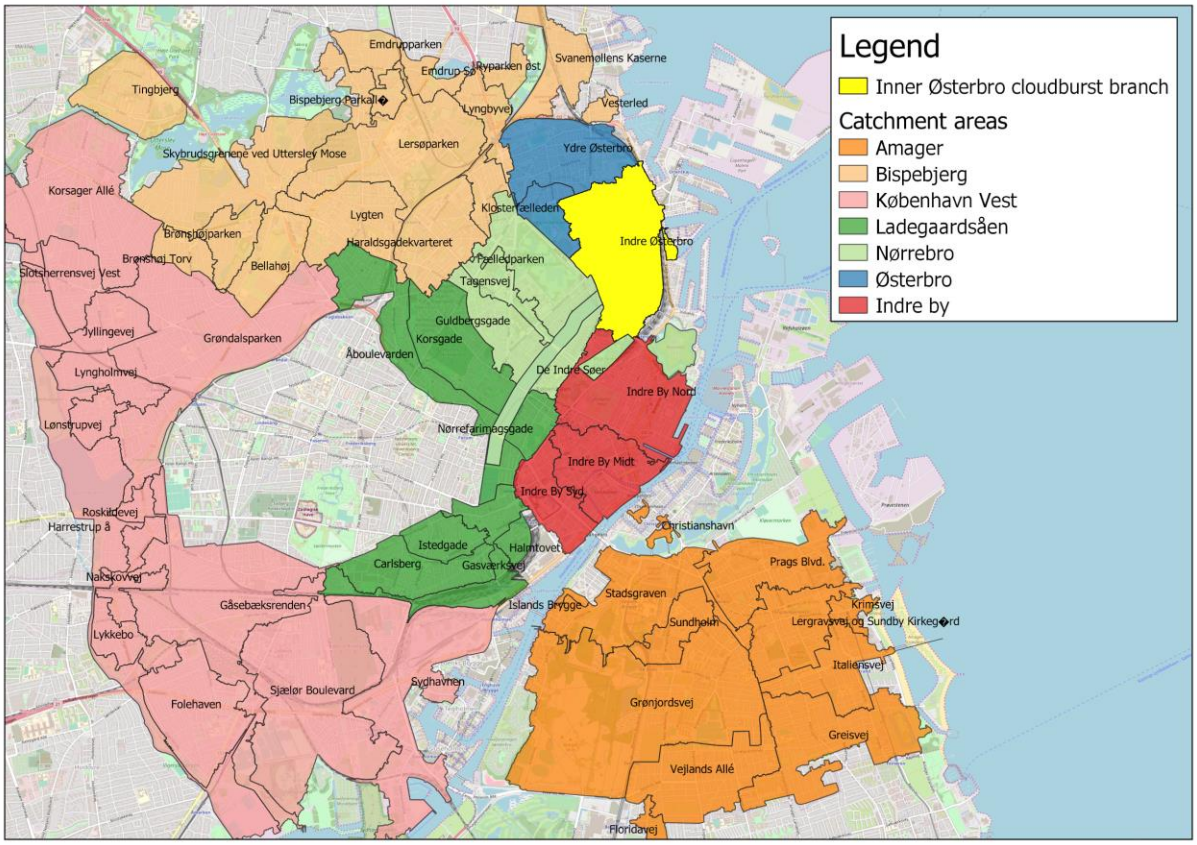

Figure 9, illustrates the 7 water catchment area and their cloudburst branches in Copenhagen Municipality (Own map).

As the projects are situated within hydrologically cohesive catchment areas, they are not to be seen as isolated projects, but rather as inter-related composites of the solution since water knows no administrative boundaries (Københavns Kommune, 2015c). For the catchment area of Østerbro, flooding is mainly concentrated to the east, as illustrated in Figure 9.

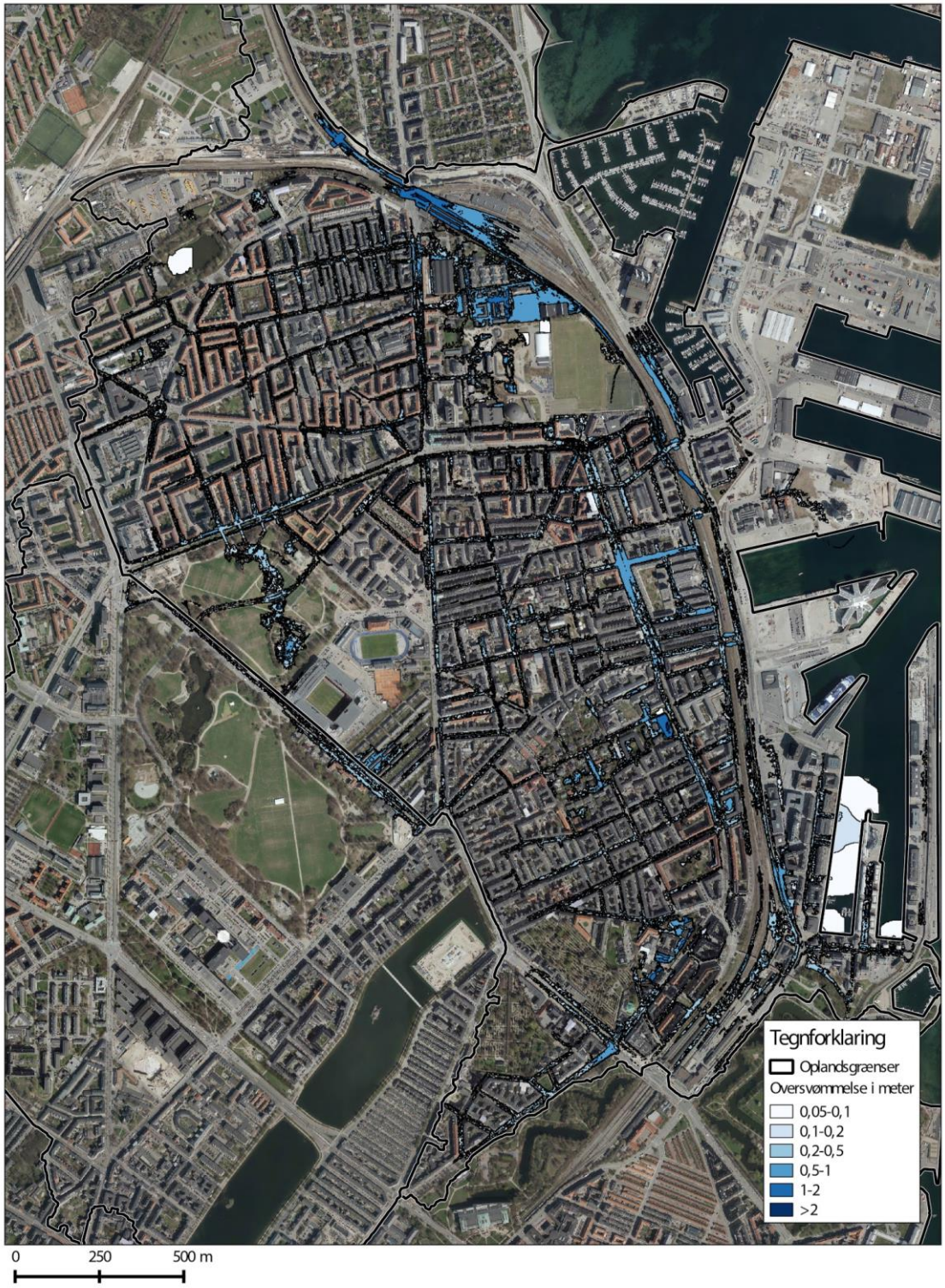

Figure 10, depicts the distribution of floodings from a 100-year event in 2010 in the district of Østerbro (Københavns Kommune, 2015c)

Due to the comprehensive and time-consuming task of executing the entirety of the Cloudburst Management Plan, the catchment areas are further divided into a total of 60 cloudburst branches which each comprise an alleviation for a particular need within the catchment area (Københavns Kommune, 2015c). This division provides a way to both prioritize projects and to document the effect they result in (ibid.). Notably, these branches consist of interrelated projects where changes in the hydrological function of one project naturally entails changes in the other projects. For instance, if the

retention capacity is reduced in one project then that capacity needs to be integrated in other projects within that cloudburst branch (ibid.). This clearly exemplifies that the rainwater infrastructure is a big interconnected organ.

The catchment area of Østerbro is divided into three cloudburst branches; 'Inner Østerbro', 'Klosterfælleden' and 'Outer Østerbro' (Københavns Kommune, 2015c). Strandboulevarden (OS1 in figure 11) is located in the Inner Østerbro cloudburst branch and is described as the backbone of cloudburst management, securing the area (ibid.). The significance of Strandboulevarden for the cloudburst branch is segmented both in its vulnerability to floods (as depicted in figure 10) and because it is the only area within the branch that has enough space to integrate sufficient retention capacity (Steffensen, pers. comm.).

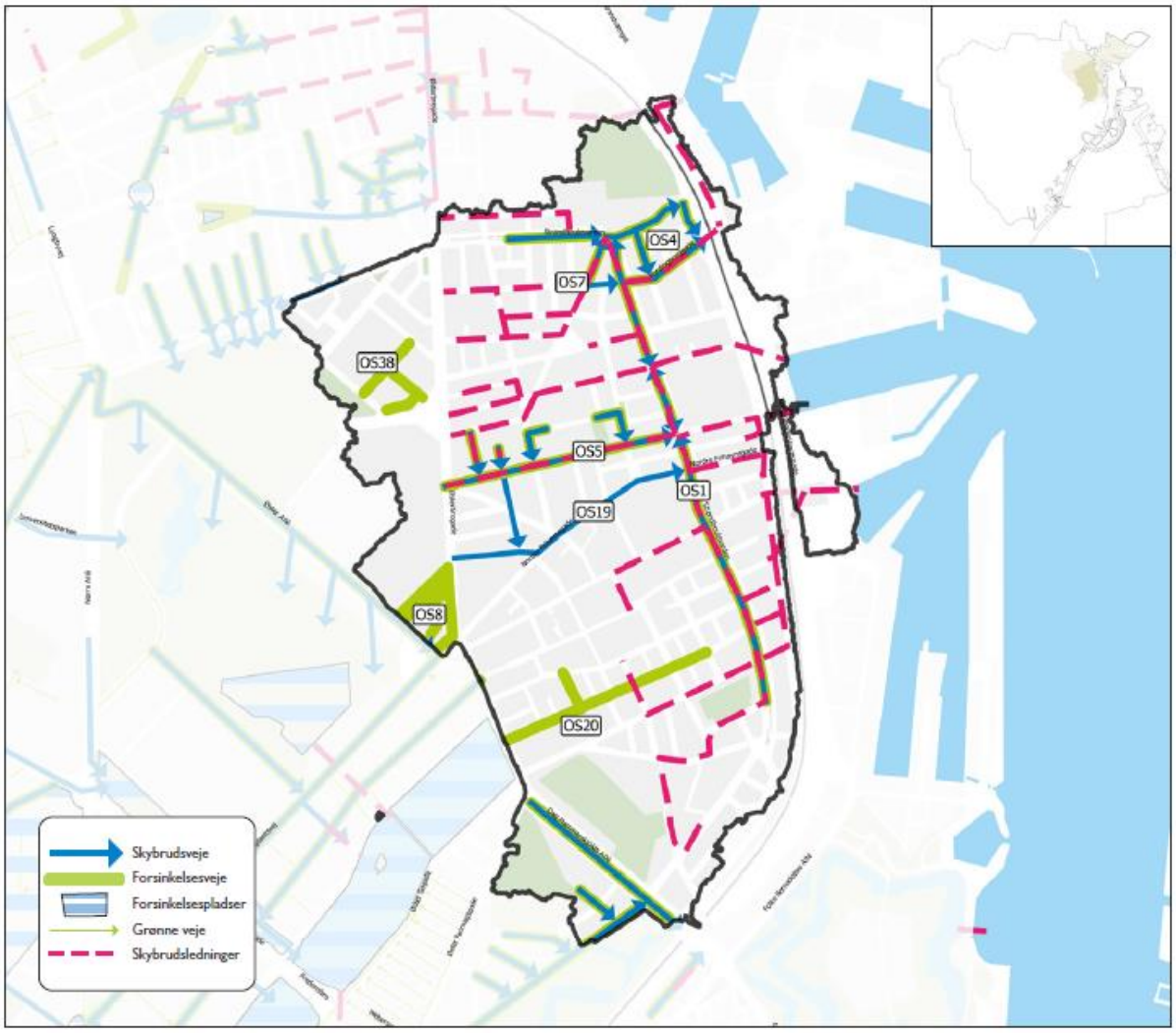

Figure 11, depicts the Inner Østerbro cloudburst branch and its interrelated projects (Københavns Kommune, 2015c)

The project of Strandboulevarden is classified as a combined cloudburst and retention road (see figure 11) and described to serve the purpose of gathering and steering a majority of the cloudburst water in the area to a planned cloudburst tunnel (Københavns Kommune, 2015c). The project is specifically set to retain 2000m^3 in basins with an overflow to the cloudburst tunnel (Steffensen, pers. comm.). A precondition for the Strandboulevarden project is therefore that it is planned in close connection to the cloudburst tunnel which HOFOR is constructing in the same area, as illustrated in figure 12.

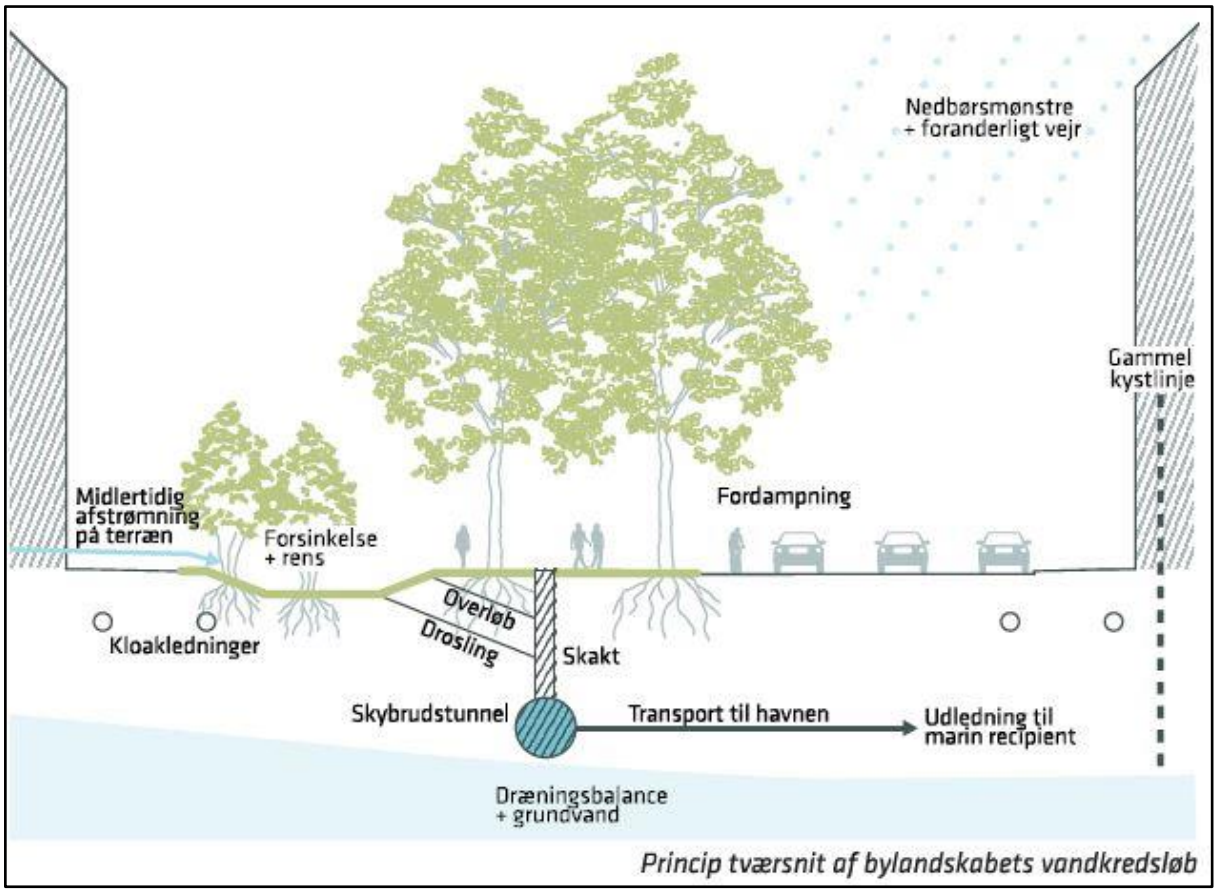

Figure 12 shows how the rainwater basins should be placed in the road with overrun to the big cloudburst tunnel underground which will lead the rainwater to the barbour (CKT, 2018).

The typologies 'cloudburst roads' and 'retention roads' constitute two out of a total of four typologies for cloudburst surface solutions, the others being 'green roads' (mainly applied to smaller local roads) and 'retention spaces' (ibid.). The function of cloudburst roads is mainly to divert rainwater thro1ugh reprofiling the road (see figure 13) and the function of retention roads is to delay and retain rainwater (see figure 13), which simultaneously provides good opportunities for urban space improvements (Københavns Kommune, 2015c).

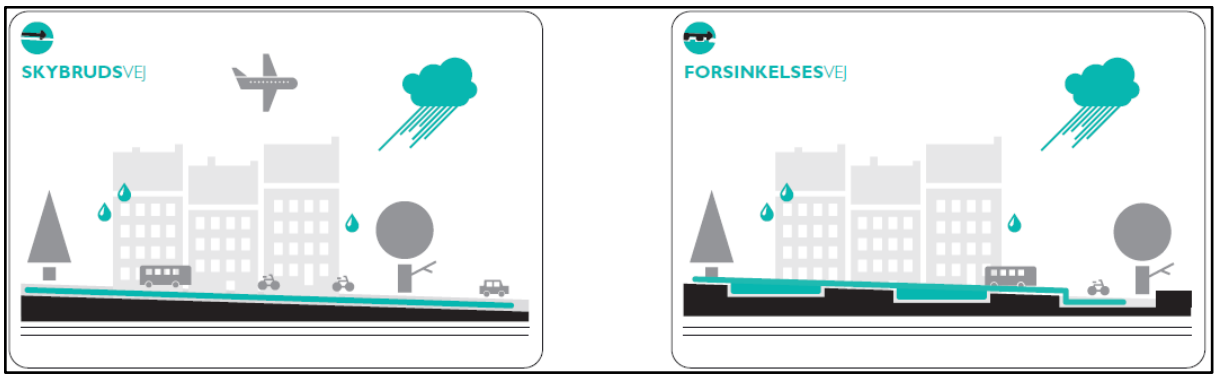

Figure 13. Illustration of the typologies 'Cloudburst roads' and 'Retention roads' (København Kommune, 2015).

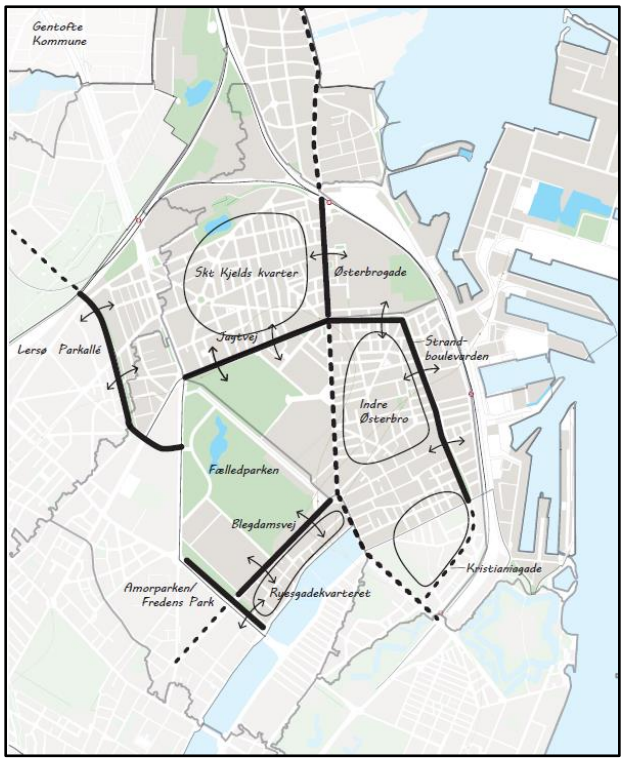

Figure 14, Illustration of the potentials within the catchment area of Østerbro (Københavns Kommune, 2015).

Notably, the Climate Adaptation and Investment Statement from 2015 does not solely describe the hydrological cohesion of the 300 projects, but it also briefly touches upon their role for the urban landscape. In this regard, Strandboulevarden is portrayed as an important urban space for the local area with the potential to serve as a connection between the district of Østerbro to that of Nordhavn (as illustrated in figure 14). Furthermore, Strandboulevarden is described as a characteristic and conspicuous urban space which, through the implementation of the Cloudburst project, can contribute to strengthening the green features in Østerbro as well as the local everyday life (Københavns Kommune, 2015c).

As described Strandboulevarden will serve as a major essential infrastructure in the cloudburst management of Copenhagen and especially on Inner Østerbro. Its technical water frames is of no discussion. But what the solution else might edict is of another importance. Strandboulevarden is as described in chapter 1, a cloudburst management project in an urban context and it is of high relevance that such urban development aspects are considered in combination with the technical solution. As depicted in the Copenhagen Cloudburst Management Plan the way to it, is a combination of green and blue surface solutions and subsurface pipes (Københavns Kommune, 2012). But how are these projects implemented and developed? Strandboulevarden is certainly under the influence of more processual and urban development frames. The following describes Copenhagen chosen method for the implementation of the Cloudburst Management Plan.

4.1.1 Method for implementation of the Cloudburst Management Plan

The method for the implementation of the Cloudburst Management Plan was developed in 2014 by the Technical and Environmental Administration in order to concretize the process from strategy to action regarding cloudburst solutions (Københavns Kommune, 2014). To develop these co-financed cloudburst projects together with the utility company, it is necessary to apply for an approval at the Utility Secretariat, which are the state organ responsible for regulating the water sector in Denmark (see Chapter 4.4 for further description) (ibid.). Thus, the model for implementing the cloudburst projects entails an initial frame application for the Utility Secretariat, including the 300 cloudburst projects, as mentioned in Chapter 4.1. Notably, all 300 projects are not initiated at the same time but

are implemented annually through project packages. Moreover, Budget Notes are developed for the projects where urban space improvements are desired (Københavns Kommune, 2015c).
In short, the model for gradually implementing and executing the cloudburst projects entails the following (Københavns Kommune, 2015c):

- A yearly climate adaptation statement is developed, which sets the direction for the action and level of ambition. The first one was developed at the end of 2015.
- A yearly project package with cloudburst projects to be initiated. These projects are then politically approved at the City Council
- If the project entails the need for urban space funds, the administration develops a budget note for the yearly budget negotiations to apply for possible urban space funds, as supplement for the co-financed cloudburst projects
- The concrete design and implementation of each project is politically decided. And hereafter further developed in collaboration with consultants.

The project of Strandboulevarden was a part of the first project package for 2016, in which 16 projects were applied for and pre-approved by the Utility Secretariat (Steffensen, pers. comm.). According to Hansen (pers. comm.), project package 16 was the first application and therefore was slightly different than the others in a lot of ways. Especially with regards to the economy, since the projects were already pre-approved by the Utility Secretariat with an estimated economy. The cloudburst project on Strandboulevarden which was applied for was estimated to cost 111,4 mio. DKK and to handle a cloudburst volume of 2000m^3. In the following a description of the process that frames the project of Strandboulevarden is presented - from initial ambitions of urban space improvements to relying solely on utility funds.

4.2 Shaping the project frames

The current requirement and frames for the project of Strandboulevarden is a result of a long process, where different scenarios have been on the table and different political decisions has been made, which have had major influence on the frames seen today. The following goes through these major significant events and describes their influence on the frames of the project. This processual description takes point of departure in the above-mentioned method for implementing cloudburst project, though events prior to this process is included to understand some of initial ambitions of improving the urban space.

The idea of a new Strandboulevarden has been long lasting, starting with initiatives taken by local citizens in the early 2000s, - long before CKT came into existence (Hansen, pers. comm.). Local citizens groups, committees and Copenhagen municipality have all developed studies and scenarios for the refurbishment of Strandboulevarden (CKT, 2018). Overall there has been two phases of developing the frames for the project of Strandboulevarden, plus the former citizens activities (See figure 15 below).

Figure 15 shows an overview of the process which will be elaborated further (own illustration).

4.2.1 Citizens and citizens groups developing proposals and visions

Several years before climate adaptation really came into the urban development agenda following the cloudburst of 2011 thoughts and visions started to emerge regarding the refurbishment of Strandboulevarden. These citizen-based proposals and suggestions had been used input in the later framing of the project of Strandboulevarden (CKT, 2018). Hence, they serve as a good insight into early ambitions of what a new Strandboulevarden could entail.

In 2004, on the basis of citizens meetings and workgroups, the Local council of Østerbro created a pamphlet called 'Inside Out', where it was suggested that the buildings functions on Strandboulevarden should have an influence on the recreational space outside each of the building blocks. This pamphlet was the start of a specific wish from the local citizens to refurbish the area of Strandboulevarden (CKT, 2018). The pamphlet was not a specific project proposal but a indication that the citizens of Inner Østerbro should have influence on a possible refurbishment of Strandboulevarden in the future. Later, in 2007, a local citizens group established by Østerbro Local council and the former local Agenda 21 Center developed, together with an architectural firm, a project proposal with a wish to transform Strandboulevarden, entitled 'the new Strandboulevarden - project proposal, from cars to people' (*Den nye Strandboulevard - projektforslag, fra biler til mennesker*). It was argued that Strandboulevarden was dimensioned for an amount of traffic that did not reflect the present needs. Hence, the vision suggested that half of the car lanes could be closed without negative consequences and thus creating 40.000m^2 of recreational urban space (Østerbro Lokalråd et al., 2007). In the pamphlet, it is argued that Strandboulevarden is the backside of Østerbro, where there is no urban life or any recreational possibilities, and that refurbishing Strandboulevarden would be a place of joy for local citizens since it would bring a higher quality of life (ibid.). It was furthermore argued that the project would also make Østerbro a more attractive place for visitors and help connect Østerbro with the new district of Nordhavnen (ibid.). The vision saw a boulevard full of gardens, squares and sports fields. The idea was to establish a line of different urban spaces on Strandboulevarden. The citizens developed four different types of urban spaces, one for housing, one for cultural institutions, one for cafés and one for sports which should be placed different places along the road, with one side of the road still serving as car infrastructure (ibid.). The vision does not state any cloudburst management intentions but the idea about a long green path on half of the road was already envisioned here. It is difficult to imagine these visions being carried out in the project as it is today, since the project is under so strict frames. Nevertheless, this citizens-based project proposal clearly stated a local wish for reconfiguring the urban infrastructure of Strandboulevarden. In 2015, the former citizen visions led to a new vision entitled 'Strandboulevarden as a green climate stretch - 7 principles for the formation of the new Strandboulevarden' ('*Strandboulevarden som et grønt klima strøg - 7 principper for udformning af en ny Strandboulevard*') by the Local Council of Østerbro. Some of the seven principles entails rainwater in the green and a high biodiversity, sun and creation of space at sideroads with afternoon sun and the green areas should be drawn into the facade (CKT, 2018).

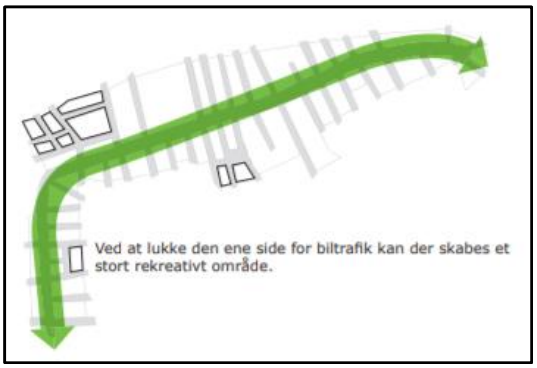

Figure 16. Shows a green park stretch could be implemented one side of the road closed down (Lokalråd et al., 2007).

The Local Council of Østerbro subsequently held citizens meetings, where citizens could come with input. The area around the stretch is densely populated, and the involvement indicated that there is a massive local wish to exploit the broad boulevard's potential for urban life and a recreational environment (CKT, 2018). During the whole process, there has been a big interest in the project from the local citizens, and as seen through these citizens-based publications, they have expressed their wishes several times. These visions and wishes however would require the presence of urban space funds, which is not the case in Strandboulevarden. Nevertheless, the local Committee and engaged citizens in the area are very interested in the project and keen to see the end results once it will be completed (Laursen, pers. comm.). Importantly, some aspects from these citizen-based suggestions has been implemented in the procurement material for the project (CKT, 2018).

4.2.2 A wish of optimizing the Urban Space on Strandboulevarden

At one point the visions and ambitions from the citizens seemed to be shared by the municipal visions for the project. Though another important element initiated the project of Strandboulevarden. After the cloudburst of 2011, Strandboulevarden was identified as a necessary element in securing Copenhagen from the adverse impacts of cloudbursts in the future, just as it became clear that climate adaptation was a pressing necessity overall (CKT, 2018). As described, Strandboulevarden serves as an essential element in securing against floods on Østerbro. Following the development of the Climate Adaptation Plan and the Cloudburst Plan, the City Council of Copenhagen, on the basis of suggestion from the Technical and Environmental Administration, had to decide the overall method for the cloudburst management on Inner Østerbro, as well as in the other catchment areas of Copenhagen as presented in the Introduction (Chapter 1) (Københavns Kommune, 2013). In 2013, the Administration suggested that the cloudburst management on Inner Østerbro should be carried out as a combination of a solution on the surface of Strandboulevarden and with pipes below the surface (ibid.). Two main principles were actually proposed, of where one was chosen, which is further elaborated in Chapter 6. It was decided to follow the suggestion from the administration and thus the overall frames for the future cloudburst management on Strandboulevarden was defined (ibid.).

This could be seen as the official start of the project on Strandboulevarden. A refurbishment of Strandboulevarden was no longer just a local wish from citizens but should actually serve as the key element in securing Østerbro against floods. This is a great example on how climate change adaptation can serve as a driver for urban development. From the beginning the administrations aimed at a solution with allocated urban space funds, creating scenarios and developing the possibilities of creating synergies with the cloudburst solution and the urban space.

The focus was seemingly on creating an urban space in connection with the cloudburst solution, thus the potentials for creating a good urban space on Strandboulevarden was investigated. During the budget negotiations in 2016, the City Council decided to allocate 1.5 mio DKK for a pre-analysis study of the possibilities to rethink the urban space and urban life on Strandboulevarden in synergy with the cloudburst management project on the surface of Strandboulevarden (CKT, 2018). This study developed three scenarios that primarily integrated the urban nature, climate and environmental challenges. Furthermore, it developed cloudburst management projects that, in different ways, handled different amounts of water, related to traffic, urban space, urban life and urban nature (ibid.). The scenarios covered the whole of Strandboulevarden. In the proposal, the cloudburst solution was financed by utility funds and optimization of the urban space in connection to the cloudburst project

financed by tax funds (urban space funds) (Københavns Kommune, 2016b). These scenarios thus presupposed the allocation of urban space funds and the starting point was to create a green and attractive urban space (CKT, 2018).

On the basis of the feasibility study the administration continued to work on a scenario with green spaces on alternately both sides of Strandboulevarden where a green path was placed on both sides and thus created good connection to existing urban life on both sides of Strandboulevarden (Niras et al., 2016). As the described model for implementation of the Cloudburst Management Plan in Copenhagen entails, urban space funds as supplement for the surface cloudburst solutions have to be applied for by budget notes at the yearly municipal budget negotiations. At this stage, it was assumed that there would be allocated urban space funds at the negotiations for the municipal budget in 2017 as a supplement for the cloudburst solution funded by utility funds (Københavns Kommune, 2016b).

4.2.3 A Cloudburst Project on Utility Funds only

The ambitions were a green and recreational urban space in connection with the cloudburst solution, which depended on allocated urban space funds. Studies had shown the possibility for removing large parts of the road in order to establish a green urban park stretch (Niras et al., 2016).

For the annual budget negotiations in 2016 (for the 2017) budget, the Technical and Environmental administration requested 65 mio. DKK of urban space funds to the creation of urban spaces in the Cloudburst project on Strandboulevarden. The City Council did, however, not allocate any urban space funds for the cloudburst project of Strandboulevarden in the municipal budget for 2017 (Københavns Kommune, 2016a). Without allocated urban space funds the project had to be financed solely by utility funds. At the following negotiation regarding the transfer of tax funds from 2016, the administration once again applied for urban space funds, this time 63,2 million DKK. This time, the administration made it clear that it was the last opportunity to create synergy between the cloudburst solution on the surface and the tunnel solution, since the planning for the cloudburst tunnel was to be started in 2017 (ibid.). No urban space funds were allocated, and it was clear that the project had to be developed and implemented on the sole basis of utility funding.

Following this, HOFOR and the municipality continued to develop a cloudburst project according to the application to the Utility Secretariat, where the budget was 35,8 mio DKK and the project should retain 2000 m^3 water. The solution needed a more specific attention to the hydraulic matter; hence the administration developed a Hydraulic Note where all the hydraulic analyses which was made in connection to the framing of the project was summarized (Hede, pers. comm.; Steffensen, pers. comm). The former feasibility study was not entirely unusable, since it explained the possibilities for the future traffic situation on Strandboulevarden, yet the lack of urban space funds meant that a new solution regarding handling of water had to be sharpened (CKT, 2018).

The Technical and Environmental Administration and HOFOR developed a preliminary analysis of the possibilities for handling the necessary amount of water within the financial restrictions of the solely utility funded project (Københavns Kommune, 2017a). It showed that the cloudburst solution should be placed on a delimited stretch from Middelfartgade to Nordre Frihavnsgade because the water on the removed stretch could be handled in existing pipes (ibid.). Furthermore, it showed that the retention basins would have to be placed on the western side because the water is streaming to

Strandboulevarden from the catchment area in west (ibid.). A placement on the eastern side would mean that the water should be transported from the western to the eastern side of the boulevard through micro tunnels which would be more expensive. The sketch proposal at this stage consisted of retention basins along the western side of Strandboulevarden from Løgstørgade to Nordre Frihavnsgade (ibid.). In connection with this, the former grant of 111 mio. DKK was suggested to be reduced by 75,6 mio. DKK to 35,8 mio. DKK since the project was reduced in comparison to the former pre-analysis where urban space funds was presupposed and now only the water management part could be financed (ibid.). As will be explored later in this report, it turned out that it is possible to get some limited urbans space aspects implemented. Still, one can see how the technical and financial aspect become more dominant in the form of ambitions for the project.

Figure 17. Presents a section of the approved sketch proposal. It shows how a green park stretch is placed on the western side (bottom) (Københavns Kommune, 2017a).

Figure 17 above shows a part of the sketch proposal which prioritizes the management of the water, while also considering the traffic and the conservation of trees. There are no urban space funds for the project, such as strengthening the possibility for activities in the green areas and other recreational elements (Københavns Kommune, 2017a). The green areas in the middle are the existing green carriageways and the retentions basins that are going to replace the west side of the road. The Technical and Environmental Committee approved the sketch proposal, developed on the basis of no urban space funds, with the purpose of approving the frames for the utility funded cloudburst solution on the surface of Strandboulevarden (Københavns Kommune, 2017a).

Specification of the project and choosing of consultants

The sketch proposal served as the basis for the development of the procurement material. The program is the basis for the material to the consultancy team that forms the specific solution for the project (CKT, 2018). The Program, created in 2018, represents the requirements that the Technical and Environmental Administration impose on the consultants, being the developers of the project (ibid.). It describes the purpose and objectives of the project which will be included in the Administration's quality assurance of the project. It also presents the overall purpose and objectives, the historical context and other relevant projects in the area and gives a condensed summary of the professional analyses and registrations which formed the background for the full Program development (ibid.). It also describes the potentials of the project and has been framed within three themes of Copenhagen Municipality's Architecture Policy (*Arkitekturpolitik*): architecture which tells (*arkitektur der fortæller*), built for the Copenhagen life (*bygget til Københavnerlivet*) and responsibly

designed (*ansvarligt designet*), as will be further elaborated upon in Chapter 5.1.3 (ibid.). In many ways, the Program is a vision for what the project should contain, not in small details like the number of trees, but the more general frames, both technically and aesthetically (Hede, pers. comm.). As is further developed upon in Chapter 5.1.3, Torgard (pers. comm.) mentions that she is glad to have this document to refer back to when talking to the consultants. She furthermore explains that she sees it as a learning process, which she also can sense when she is talking to the consultants, as elaborated in the following quote:

"*The first time they read it, they read it from the point they were at that time. Now when they have worked with the project and heard the response to what they are proposing, they are learning to do this kind of project*"

(Torgard, pers. comm.)

As will be further elaborated upon in Chapter 5.1.3, the consultants - as well as the municipality and utility company - are not used to doing this type of project where there are no urban space funds. As will become apparent through the following analyses (Chapters 5 and 6) can be challenging and requires new ways of working and collaborating.

The consultants were chosen based on a Framework Agreement for Parks and Urban Spaces, which is as a firm agreement between the Technical and Environmental Administration in Copenhagen Municipality and three consultancy teams which have been chosen as main consultancy firms consulted when the municipality has projects to be implemented. The Agreement amongst others, entails that there are beforehand agreed fixed prices, suggesting that the municipality knows what to expect and that they do not have to negotiate the prices each time (Hede, pers. comm.). Another element mentioned in the Framework Agreement, which is central for this project is the fact that the consultant constellation must be build up by a landscape architect firm as main consultant and an engineering firm which handles the technical perspectives as second consultant (ibid.). In the Strandboulevarden project, the chosen consultants are thus BOGL - the landscape architecture firm, and Orbicon - the engineering firm. Hede (pers. comm.) explains that following the paradigm Copenhagen has for their cloudburst management, they will always be looking for a consultancy team consisting of landscape architects and engineers. As such, even though the cloudburst projects are very technical oriented from a water management perspective, it is first of all an urban space project since it is a big intervention in the urban space. This is a very important point to remember, as Hede (pers. comm.) highlights. Hence, the landscape architect will always be the main consultant and the engineer the subconsultant, in order to portray that the urban space is of paramount importance (ibid.). This is an interesting point to note, considering that no urban space funds were allocated in the Strandboulevarden project, the consequences of which will be further delved into in the examples in Chapter 6.

BOGL and Orbicon thus received the Program and the Hydraulic Note summarizing all the hydraulic frames for the project as the primary documents for the description of the task (Hede, pers. comm). Due to the Framework Agreement, CKT already knew the hourly prices and what specific employees the companies would make available, so they primarily asked the consultancy teams to come with their proposal on how to get on with the task and how they could see the municipality's vision carried out in the project, given these specific frames (Hede, pers. comm.). As the CKT project manager for

Strandboulevarden, Bjørneboe (pers. comm.) explains, the choice of consultants was a conscious choice.

"*You could have used that one [a Framework Agreement focused on roads], but there I have to say that we think it's an urban space, hence it is important that there also is a landscape architect. Because [...]it had to be a team where they were also able to think urban spaces."*
(Bjørneboe, pers. comm.)

More specific the task was described as a technical solution with built-in more value. Even though the solution must be grounded in hydraulic justifications, as specified above, the urban space of Strandboulevarden has a great opportunity for improvement (CKT, 2018). As will be further elaborated upon in Chapter 5.1.3, it becomes apparent how the practitioners focusing on the urban space aspects in the project, frames the task to emphasize, that although the project does not have urban space funds available it should still be a solution that respects the existing urban space and create some kind of value for the urban space (Torgard, pers. comm.). In fact, the neglection of urban space funds does not seem to have extinguished the ambition of creating a cloudburst solution in synergy with the urban development of Copenhagen. Interestingly, this is also Copenhagen Municipality's ambition for all the cloudburst management projects in the city, as mentioned in the Cloudburst Management Plan.

"*The City of Copenhagen has an ambition to increase the blue and green infrastructure in future. The drainage of precipitation from intensive downpours is an important element in the physical planning process in Copenhagen. Pluvial flooding adaptive measures must, therefore, be incorporated into the wider local master plans and urban development projects thereby promoting the blue and green infrastructure of the city"*
(Københavns Kommune, 2012, p. 8)

As the following analyses and discussion (Chapter 6 and 7) will examine, the extent to which this is possible without urban space funds is to be discussed. The quote nevertheless also emphasizes that cloudburst management entails a large focus on how the hydraulic cloudburst solution can contribute to urban space qualities. Since the Program and procurement materials are largely based on the former political approved sketch proposal, the solution was presented being placed on the western side of the road, since this made sense both hydraulically and financially (CKT, 2018). The Program states that the overall disposition from the politically approved sketch proposal should be maintained, but that the consultants should further develop an in-depth analysis with the design of the retention basins (ibid.). As will be analyzed later, the overall disposition of the sketch proposal did not really stand tall because of several important aspects (see Chapter 6).

4.3 Cloudburst Management in the Context of Strandboulevarden

In 4.1 and 4.2 the overarching frames for the project were presented, where Strandboulevarden is portrayed as a piece of a larger puzzle, and that the current frames is a result of a longer process. Nonetheless, it is first through the project near stages that these overarching frames are materialized and qualified into more specific ambitions and demands that take the local context into consideration (Steffensen, pers. comm.).

Before concretizing these target objectives, there is a need to understand the project area. The project area has changed through time, following decisions regarding whether to allocate urban

space funds or not. The current project area is a result of the project being delimited by solely relying on utility funds and thus only comprise the area needed to create the hydraulically necessary solution (CKT, 2018).

4.3.1 The Physical Project Area

The Strandboulevarden project area (referred to as 'the Strandboulevarden project') is a 700-meter stretch located between Løgstørgade and Nordre Frihavnsgade (see figure 19), which only constitutes a smaller part of Strandboulevarden (CKT, 2018). The project area includes the entirety of the urban space from facade to facade, which is owned by the municipality. Characteristic for the area is the encompassing building blocks, which are from around 1900 and a 10-meter broad green carriageway with one or two rows of trees in the middle of the street (see figure 18). In general, Strandboulevarden shows marks of being wore down and there is a lot of unused space (ibid.). The carriageway has varying width, some places as narrow as 1 meter and other places wide enough to sustain functions and activities such as dog walking and parking. On both sides of the carriageway, two car lanes are located. This road infrastructure was in the feasibility study from 2016 estimated to be over dimensioned. A third lane is, furthermore, located on both sides of the road, which is used as parking space and north of Vordingborggade there is a bike path in both directions. The northern part of the road, that is down to Vordingborggade, is classified as a distribution road and the remaining stretch within the project area is classified as a district road in the municipal plan. The distribution roads serve the purpose of distributing traffic between the different districts whereas district roads seek to minimize thoroughgoing traffic (ibid.).

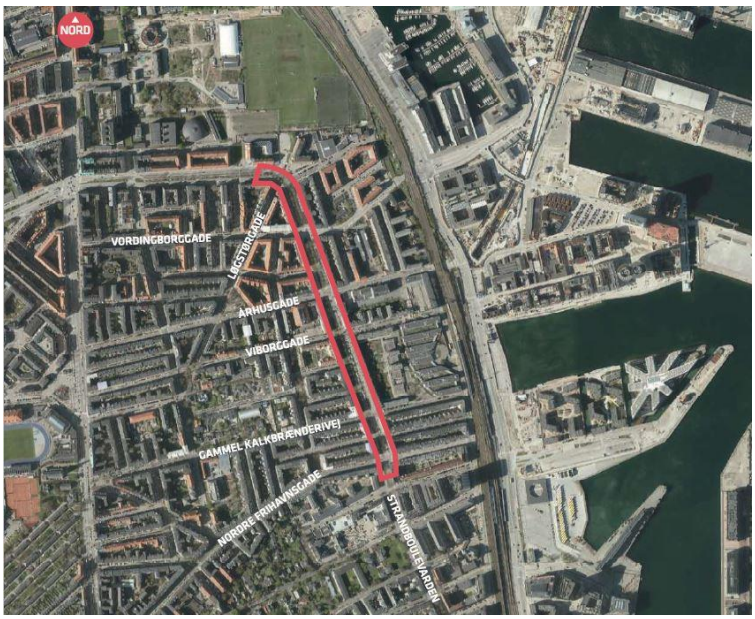

Figure 19, overview of the project area of the Strandboulevarden project (CKT, 2018).

Figure 18 show a picture of Strandboulevarden from above (CKT; 2018).

4.3.2 Project Specific Demands

The hydraulic frames have largely been maintained throughout the process with the exception of an added requirement to also deal with as much everyday rain as possible (CKT, 2018). This is a

consequence of the critical state of the sewers in the area, analyzed by HOFOR to pose a serious capacity deficit (Hede, pers. comm.). Thus, the project also includes decoupling of everyday rain from the sewers to the cloudburst tunnel. In that regard, requirements regarding water quality applies due to the tunnel discharging into the ocean (see Chapter 4.4). To sufficiently alleviate the sewers, everyday rain falling on not only roads, but also on sidewalks and roofs facing the roads are included. Notably, the majority of the gutters on the old buildings are made out of either zinc, led or cobber and thus needs to be purified before being discharged through the cloudburst tunnel into the ocean (Hede, pers. comm.). Therefore, the project includes the establishment of not only retention, but also purification basins. However, everyday rain which falls on the heavily trafficked roads is, by Water and EIA (the municipal authority who regulates discharge allowances), assessed to be too contaminated for purification basins to purify to a satisfactory level and therefore needs to be diverted to the existing sewer system (ibid.). The water management system hence constitutes a complex system where everyday rain and cloudburst water is diverted through a variety of infrastructures to different recipients, i.e. the ocean and the purification plant.

To make room for the surface solution, two car lanes from south of Vordingborggade down to Nordre Frihavnsgade are decommissioned and the speed is reduced from 50 km/h to 40 km/h (CKT, 2018.). This includes a transformation of the boulevard's characteristics from a traditional traffic dominated urban space to a greener area which still takes current traffic needs into consideration. Nonetheless, the project of Strandboulevarden is a 'minimum project' (as will be elaborate upon shortly), constituting a new type of landscape in the city where aesthetics and architectural design is cut all the way to the bone due to the technical and financial bindings (CKT, 2018). Accordingly, the municipality stresses that it is pivotal that the consultants which develop the solution think holistically by developing solutions with respect to the particularity and values of the area (ibid.).

4.3.3 The Financial Ramifications

As the Strandboulevarden project solely relies on utility funds through the co-finance agreement, the creative span regarding urban qualities and functionalities is greatly reduced, *"In short, limited funds is a bitch"* (Hede, pers. comm.) It places true limitations for what is possible in this new type of projects.

The co-finance notice as already explained in the introduction (Chapter 1) sets the frames for how much a Utility company can finance with utility funds regarding alternative surface climate adaptation solutions. According to §2 in the Co-finance Notice:

> *"Utility companies can only incur and recognize expenses which, according to a concrete assessment, are necessary for the sake of an alternative project's handling of roof and surface water, including costs for investment, operation and maintenance, and costs for restoration."*
>
> (BEK nr 159, 2016)

This means that, since Strandboulevarden is a co-financed project only, the solution that can be financed must be justified by its necessity for handling rainwater. Indeed, the core issue in this project is that everything must be 'hydraulically founded'. However, the question of how this is materialized in the Strandboulevarden project remains. Hede (pers. comm.) explains that the municipality has a

legal framework that enables them to finance cloudburst solutions on the surface with 100 percent utility funds. Copenhagen Municipality and HOFOR have, in this regard, developed a typology note which states how they can use the utility funds (ibid.).

As an example, he mentions the life extension of the surface (road or tiles). A road will be worn down over the years and when the road subsequently is in bad shape it has to be renewed, which is the financial responsibility of the municipality (Hede, pers. comm.). This suggests that when doing projects where the surface is dug up, as will eventually be the case in Strandboulevarden, they will automatically have to renew the road since a worn-down surface, naturally cannot be re-established. This pose an issue in the context of a co-financed project, as it is not clarified how to pay for the re-establishment of the road (ibid.).

The hydraulic aspects are as such dictating the premises of this project. Moreover, making purely utility funded projects is a new exercise and there are lot things which will be first time experiences for everyone involved (Hede, pers. comm.). Hence, there is a need for developing a method to navigate these projects, as expressed by CKT themselves.

Minimum solutions

The prerequisite for co-finance projects is that they should maintain existing values and contribute to strengthening the potentials of the space, the minimum requirement being that they do not worsen the urban space (Hede, pers. comm). An example is the crossings on the road. No matter which side of the road the green path is placed on, there will be car lanes crossing the green path at certain sideroads (see Figure 20). Considering that everything in the project must be hydraulically founded, it is only possible to make a surface which is the minimum requirement for such crossings (Hede, pers. comm.). If they wish to establish a path through the long park stretch, this cannot be hydraulic justified. Yet, as long as it cost the same as planting grass, it is fine. Furthermore, there are still accessibility requirements which must be taken into consideration; even if one has to use the cheapest design. As Hede explains: "*if you, based on to the city's Design and Architecture Policy, can accept a gravel path instead of tiles, that is what you get*" (Hede, pers. comm). Nonetheless, the question of whether municipal design requirements can serve as a justification for the use of utility funds remains unanswered (ibid.). Yet, although BOGL states (Schmidt, pers. comm.) that they are experts in 'cheap' solutions, this might not be enough in this situation.

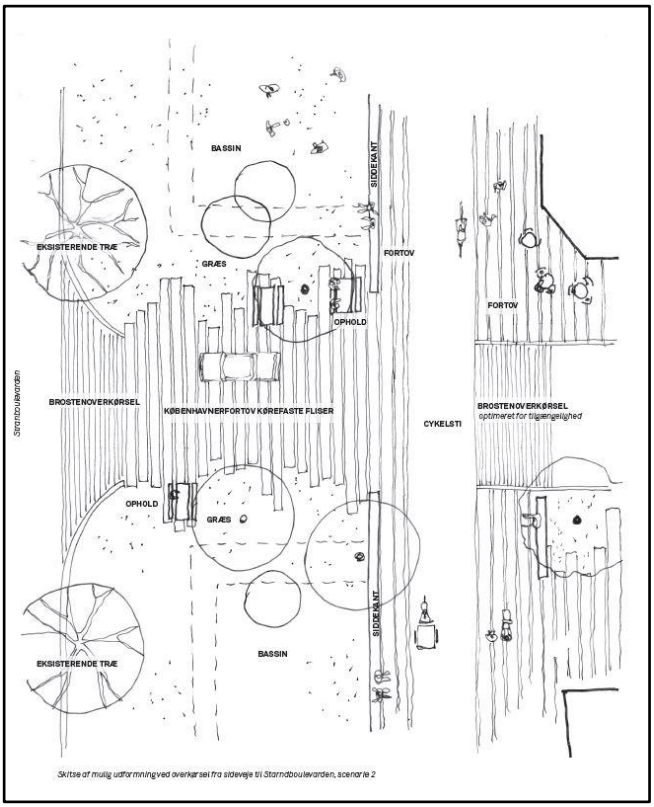

Figure 20 shows a sketch made from BOGL, which shows the road crossings from the sideroad (BOGL and Orbicon, 2019).

"If you cut it all the way to the bone, you can't get anything else for the money you have saved. That is what we typically do in other projects, to concentrate the action or take this fixture out, because then we can afford this. But we can't do that here, that strategy we can't use here."
(Schmidt, pers. comm.)

As such, it becomes clear how the 100 percent Co-finance Agreement implies that only minimum solutions can be applied. The following will summarize who is involved in the project directly and indirectly and how they influence the development.

4.4 Organizations and Actors Involved in Strandboulevarden

The project of Strandboulevarden encompasses a wide variety of organizations and actors due to the division of responsibility and co-dependent deliveries across the municipality, the utility company, the consultant firms as well as actors from other organizations involved. In this subchapter, the various actors and organizations are thus described, to give a clear overview of the main stakeholders and some of the dynamics within and between these actors.

Center for Climate Adaptation - CKT

In Copenhagen municipality, it is especially the Center for Climate Adaptation (*Center for Klimatilpasning*, referred to as CKT) which is of relevance, as they are responsible for the execution of the Cloudburst Management Plan; from the early strategic planning phases to the construction of specific projects (Steffensen, pers. comm.). CKT was established in 2018 on the basis of gathering the previously scattered efforts, responsibilities and competencies within one center in the municipality. The below diagram (Figure 21) presents some of the main professionals' logics which are represented in the Center with regards to the execution of cloudburst management projects. It specifically highlights the role of the different actors and presents some of the main strategies, plans as well as tools they use. The role diagram will be further used when presenting the various practitioners that adhere to the spatial qualities in the project, in Chapter 5.3.

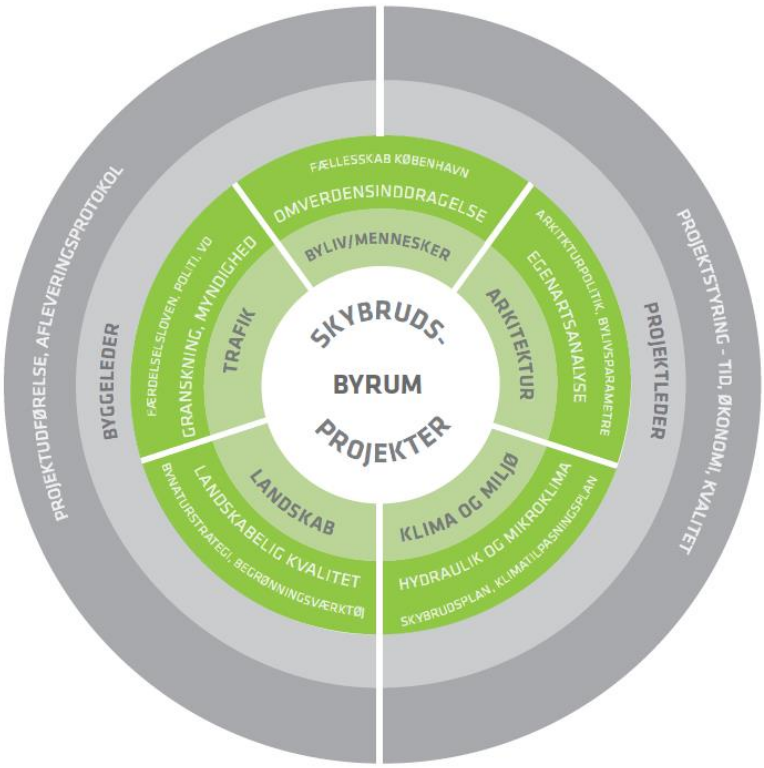

Figure 21. Role Diagram for Cloudburst Management - Urban Space - projects as see by CKT. It showcases the different roles of the construction and project manager divided into: traffic, landscape, climate and environment, architecture and urban space/people, with specific strategies, plans and tools that the that the practitioners in these categories can use (CKT, n.d.).

Central actants not represented by the above diagram are the more administrative positions as well as the political aspects in cloudburst management projects in CKT. The politicians certainly play a central role, as has been made apparent in the former process description above (Chapter 4.2), since they are the ones approving the Budget Note and sketch proposals, amongst others. The following diagram (Figure 22) shows the process of Strandboulevarden where the political influence and projects phases becomes apparent.

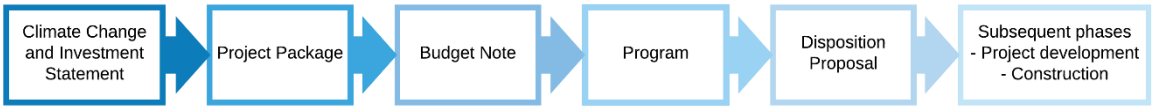

Figure 22. Shows a simplification of the process for the project of Strandboulevarden (own illustration).

Water and EIA

The Cloudburst Management Plan not only entangles practitioners from CKT, but also other municipal departments responsible for, and with knowledge about, water bodies, road regulation, maintenance, and urban space (Hede, pers. comm.). As the cloudburst resolution to a large extent builds on infrastructures which are decoupled from the sewers and which retain and steer water to the ocean, i.e. the recipient, demands regarding purification apply. These demands are derived from EU and national legislations which regulate the quality of water environments (EU, 2000; Mst.dk., n.d.). In Copenhagen Municipality, it is the Water and EIA (*Vand og VVM*) department who enact and apply these regulations in the form of applying demands to discharge allowances. In the case of

Strandboulevarden, it is not the project itself which needs to seek this allowance. In effect, this issue resides in the Cloudburst tunnel project where HOFOR is responsible for obtaining the allowance (Steffensen, pers. comm.). This implies that the tunnel project needs to be closely coordinated with the projects within the catchment area as the obtainage of a discharge allowance requires HOFOR to have a total control over the amounts of water being discharged and the proportion thereof which needs to be purified (ibid.). Therefore, HOFOR's project leader for the Cloudburst tunnel project has been in close coordination with the Strandboulevarden project, amongst others through participating in project group meetings (Project Group meetings, 2019).

HOFOR

As described in the Introduction (Chapter 1), one of the central interrelationships is between the utility company and the municipality. The traditional approach with separate urban space and water management infrastructures allowed infrastructures to be developed and function with limited overlap and contact between each other. However, with the new approach the infrastructures need to be carefully interwoven. This not only implies a need for a closer collaboration, but it also increases the institutional complexity by blurring previously distinct divisions of responsibility. This interrelationship is mainly segmented in the Cloudburst Management Plan which creates a co-dependency relation between Copenhagen municipality and HOFOR through the combination of surface and subsurface solutions. A central dynamic in this regard is tied to the co-finance nature of surface solutions, where the deal between the municipality and HOFOR is that HOFOR pays for the water management while the municipality constructs and maintains them and, furthermore, pays for the expenses related to "nice to have" facilities (Hede, pers. comm.).

Utility Secretariat

Another central organization which has an influence on the development at Strandboulevarden is the Utility Secretariat (*Forsynings Sekretariatet*), as has been previously mentioned. In the end, everything depends on their final approval as they are the ones approving that the municipality is allowed to take up a loan - which HOFOR will have to pay back over a 25-year period - as specified by the Co-finance Agreement (BEK nr. 159, 26/02/2016). Although the Utility Secretariat's' role can be seen as central, their influence will not be delved further into in this report as the Co-finance Agreement constitute the materialization of their influence.

Consultancy firms

Lastly, other central actors are the consultant firms Orbicon and BOGL, in the form of project leaders and specialists from respectively the water management and urban space occupational community (as elaborated in Chapter 5). In effect, BOGL, being the main consultant and landscape architecture firm on the task, are primarily responsible for ensuring a holistic and aesthetic design of the cloudburst management solution on Strandboulevarden, while Orbicon, the engineering firm and sub-consultant, are responsible for the water technical aspects, as will be much further elaborated in Chapter 5.

Other actors involved

The current project group team for the Strandboulevarden is primarily composed of personnel from CKT, and the consultants BOGL and Orbicon. Yet, it also includes key personnel from the 'Road and Bicycle' and 'Park and Urban Space' departments in the municipality, who have in-depth knowledge

of road regulations and urban space considerations (Hede, pers. comm.). Although they also play a role in the project, these are only merely considered in this thesis as focus lies elsewhere.

Other relevant actors to describe are members of the Coordination Group of the Strandboulevarden project at CKT. In effect, the Project Group is responsible for translating the demands and ambitions imposed by the various plans and strategies into the context in which they operate. Further, their task is to find solutions and to shed light on the inherent consequences and opportunities of those solutions. In that regard, the consultants work within the frames that the municipality asserts, whereas CKT develops frames for the consultants' task and simultaneously challenges impeding institutional frames (see Chapter 6 for an exemplification) (Hede, pers. comm.). The decision mandate of which solution to go with does not, however, reside within the Project Group. This is where the Coordination Group comes into the picture. They uphold the decision-making power when larger, more principal decisions are to be made - such as whether the basins should be placed in one side or the other of the road in relation to the inherent risks (as elaborated in Chapter 6) (ibid.). The Coordination Group consist of managers from HOFOR, CKT and other municipal departments which are influenced by the project residing within an urban space (ibid.).

The last group of actors that ought to be mentioned are the local citizens of Østerbro and the Local Committee of Østerbro. These represent the voices of civil society, who are mostly concerned about the aesthetic and functional outcomes of the Strandboulevarden project once completed, as further presented in Chapter 5.3.

Conclusively, all relevant actors involved in the Strandboulevarden project have been described. Yet, it must be remembered, as mentioned in Methodology (Chapter 3) that a 'follow-the-actor' approach is taken, whereby the empirical data has guided the research group towards the important actors to consider. As a result, there are certainly more actors with a stake in this project, yet this is beyond the purview of this thesis. Indeed, focus here is on how practitioners can navigate towards the 'good' solution in a cloudburst management project with financial constraints. Accordingly, it becomes essential to understand how different interpretations of the 'good' solution are embedded within the different occupational communities of the actors involved - and which institutional logics these represent.

5. Occupational Communities and Institutional Logics in Strandboulevarden

The former chapter established the organizational field that revolves around the case of Strandboulevarden. The following chapter seeks to identify the different institutional logics that are present in the case of Strandboulevarden thus answering the second sub-research question: *"How are different interpretations of the 'good' solution embedded within occupational communities and institutional logics?"* This is done by identifying groups of individuals with similar perspectives, beliefs and norms and classifying them into occupational communities, whereby the differences in perspectives and actions of these groups become apparent, exemplifying the institutional logics present in this project.

5.1 The Predominant Occupational Communities in the Strandboulevarden Project

As mentioned in Theory (Chapter 2), the organizational field encompassing the practice of climate adaptation consists of numerous subpopulations which follow and employ different logics. These sub-populations are defined as occupational communities, which are groups of individuals that cut across organizations, sharing common language, perspectives and assumptions, and which actively translate and communicate norms and beliefs that reflect their own culture and interests (Hoffman, 2001). In the Strandboulevarden case, various occupational communities are at play. In fact, "*everyone is supportive in trying to find the 'good' solution together in principle, but we all have our main case to fight for"* (Schmidt, pers. comm.). Accordingly, three occupational communities have been specifically selected to examine how the different interpretations of the 'good' solution by practitioners are embedded within the various institutional logics at play. These are the occupational communities of: project management - encompassing the financial and political aspects; water management - focused on the technical solutions for handling water; as well as an occupational community focused on the urban space. These are presented, and justified for, in the following analysis, whereby the different institutional logics influencing the creation of the 'good' solution in this new type of climate adaptation projects become apparent. The ordering should not be seen as a ranking of importance, but rather as a reflection of the nexus of interconnectedness.

It is necessary to emphasize, as mentioned in the Methodology Chapter (Chapter 3.3.1), that the occupational communities presented below are 'ideal types', meaning simplified, synthetic, analytical and abstract representations of the institutional logics based in empirical observation (Ocasio et al., 2017). This suggest that other occupational communities entangled in the Strandboulevarden project are left out; such as the occupational community of traffic planning. Indeed, the researchers of this thesis deliberately depart from reality by focusing on certain attributes, using ideal types for analytical purposes. The division is based on the empirical findings in the project and defined by the research group.

5.1.1 The Project Management Occupational Community

A central perspective to a complex project, as Strandboulevarden, is the role of a project manager. As Bjørneboe (pers. comm.) - the current project manager from CKT - states, his role is to facilitate the process, convene and lead meetings, and set a timeframe. As such, focus for this occupational community is on a smooth and successful process. Shenhar et al. (2001, cited in Samset and Volden, 2016) offer a sequential order of events as a compound definition of project success: (1) meeting time, budget, and other requirements, (2) impact on the customer, (3) benefit to the performing organization, and (4) preparing the future. As such, from a project management perspective, a successful project is one that delivers its outputs and significantly contributes to the fulfillment of agreed objectives (Samset and Volden, 2016). Moreover, as Samset and Volden (2016) argue, a project should have only minor negative effects, its objectives should be consistent with needs and priorities in society, and it should be viable in the sense that the intended long-term benefits resulting from the project are produced. These are some of the main considerations made within the project management occupational community.

The Strandboulevarden project has been ongoing for a long time, passed on from one project manager to the next, with major political and financial changes happening (Ørsnes, pers. comm; Bjørneboe, pers. comm.). There are various administrative and project coordination related aspects to the project such as communication with politicians, coordination and collaboration with the consultant firms, HOFOR, Water and EIA, and the Utility Secretariat, and coordinating with and getting advice from the CKT project group (see description of the actors involved in Chapter 4.4). Furthermore, the project manager has an influence on which professions at CKT are to be represented in the group group. Bjørneboe (pers. comm.) for instance requested to have a hydraulic expert as part of the team, knowing that the water management aspects are important in this project. As described in Chapter 4, a major challenge for the project management occupational community is the fact that the project has been amputated of urban space funds, as will be expanded upon shortly (Bjørneboe, pers. comm.; Hansen, pers. comm.; Ørsnes, pers. comm; CKT, 2018).

A central element within the project management community is the financial facet. Similar to all cloudburst management projects in Copenhagen, the Strandboulevarden project must establish a cost-effective urban space-based cloudburst solution at the surface rather than a traditional pipe solution (CKT, 2018). As a rule of thumb, the (green) surface solutions are allowed to cost 70 percent of what the traditional (grey) underground solution would cost (Københavns Kommune, 2015c, p. 29). Yet, the Strandboulevarden project is further constrained. As Hede (pers. comm.), water expert from CKT, highlights, the Strandboulevarden project is based on unique preconditions and not necessarily positively so.

> "*It is the only project that is started without municipal urban space funds, which means that we are entirely dependent on the solution being hydraulically founded. We cannot put anything extra 'nice-to-have'. Only if it entails water management and can be justified through the co-financing notice*"
>
> (Hede, pers. comm.).

Indeed, the 100 percent Co-finance Agreement specifications mean that everything has to be hydraulically founded, as was explained in Chapter 4.4 Similarly, the current project manager of Strandboulevarden explains how "*the project has been very tight, and every coin needs to be turned.*

It has not been possible just to say, yes let's just do that. We need to say: we do this solution, because that is the cheapest option possible" (Bjørneboe, pers. comm.). The financial constraints dictate the preconditions of the entire project and it represents a major challenge for numerous of the actors involved in the project, as the following quote further highlights.

"The fact that there are no urban space funds truly represents an impediment. Everything about the hydraulics and about creating the 2000 m^3 etc. we will find a solution for, that's not the problem. Neither is the collaboration with the engineers, which sometimes can be quite problematic. Or with the municipality for that matter. At least not yet. That is actually all going quite fine. The main challenge is no doubt that it is 100 percent co-financed."

(Schmidt, pers. comm.)

As such, the financial specifications are especially noteworthy in Strandboulevarden, as the project management occupational community is obliged to navigate in this complex web where every decision needs to be hydraulically founded based on the financial constraints which dictate the project's physical development. Furthermore, there are other regulatory requirements which must be taken into consideration, such as traffic and fire escape routes, as will be further elaborated upon in Chapter 6 (Bjørneboe, pers. comm.).

Interestingly, Samset and Volden (2016) explain that the potential to reduce uncertainty and risk is the largest up-front and decreases substantially when a project is implemented. As such, it is paradoxical that most of a project's planning resources are being spent on detailed planning and engineering, while too little is usually spent on getting the idea right from the start where the potential to reduce uncertainty by means of adding information is the largest (ibid.). In the Strandboulevarden project, this is reflected by the fact that there was an 'execution pressure' at CKT, whereby an internal deadline was set for the completion of the surface solution on Strandboulevarden to match the completion of HOFOR's cloudburst tunnel (Hansen, pers. comm.). There was a fear that the project would end up being an inactivated investment if the completion of the surface solutions did not match the completion of the underground tunnels (Hanse, pers. comm.). However, alterations to the project, such as the initial thought that the whole street would be dug up were stopped due to the 100 percent co-finance constraints, meaning that the project has significantly changed characteristic. Samset and Volden (2016) state that the paradox is that most resources are used to reduce uncertainty during the implementation phase, where the potential is much less.

Accordingly, another challenge as seen from a project management perspective, is the political assessment of the project. The current project projections differ significantly from the draft proposal, which was politically approved beforehand, as important water and traffic related aspects were missing - as will be elaborated in Chapter 6 (Bjørneboe, pers. comm.). This is clearly a challenge from a project manager perspective, since the frames in this project are extremely difficult to predict, due to the novelty of this type of project and the complexity this entails. Still, the project manager from CKT and project group is responsible for ensuring that the new proposal is presented to the politicians who will have to make a decision accordingly. Hence, although the political perspective is not directly involved in the project, it has a significant influence on the execution as well as the physical outcome of the climate adaptation project on Strandboulevarden, and hence on the beliefs and understandings of the project as seen by the project management occupational community. Indeed, as was mentioned

in Chapter 4, the politicians are the ones approving the proposal and processing of the Budget Notes, which regards to where and how much urban space funds are allocated to different projects.

A further consideration within the project management occupational community is the fact that the project has all the characteristics of being a pilot project - being the first project to be completed without urban space funds - but still it is not a pilot. Since it is the first time the municipality is doing a project based only on co-finance funds, there is quite a lot of development work to be done. Yet, "*in principle there is no money allocated in the economy for this development work. It will be more resource-intensive because we have to establish a procedure around it first*" (Torgard, pers. comm.). Indeed, from a project management perspective, the project is more resource intensive due to the novelty of this type of complex projects, where a holistic approach and close collaboration with all partners involved is necessary, as will become evident in Chapter 6. The project will presumably function as a learning process for everyone involved; be it for CKT, HOFOR, the consultant firms, Water and EIA as well as the Utility Secretariat.

To summarize, the occupational community of project management have distinct assumptions, values and beliefs about how to tackle the complexities within this project which steer how the practitioners within this community provide meaning to their social reality where focus is primarily on budget, time management and execution of a 'good' solution project. Clearly, the financial facets are especially predominant, as will be further enlightened through the detailed exemplifications in Chapter 6. Furthermore, the ways in which the practitioners navigate the complexity of the project is hinted at - and will be further elaborated upon in the discussion in Chapter 7.2. Certainly, the priorities taken by practitioners within the project management occupational community are different than those of urban space and water management. As Strandboulevarden is a cloudburst management project, the occupational community of water management will now be further analyzed.

5.1.2 The Water Management Occupational Community

The water management occupational community consists of professionals - mainly practitioners with a technical oriented or engineering background, coming from numerous of the organizations involved in the Strandboulevarden project. Indeed, there are not only water engineers from HOFOR and Orbicon, but also from CKT, with Water and EIA (*Vand og VVM*) and the Utility Secretariat also having an influence. This occupational community is highlighted here, since the water related aspects are of paramount importance in all cloudburst management project, and especially relevant to consider in this project, due to the importance given to hydraulic aspects in Strandboulevarden, as before mentioned in Chapter 4. The main objectives, as seen from a water management perspective, is to relief the sewers and to handle stormwater (Hede, pers. comm.). In order to relief the sewers, everyday rain must be handled and cleaned before it is discharge to a marine recipient (further explained in Chapter 6). Most of the water related norms and beliefs are thus shared across organizations within the organizational field, whereby the different water professionals are able to speak a 'common' language and have shared understandings about the technical solutions to be deployed for climate adapting Strandboulevarden, as will become apparent in the examples presented in Chapter 6. As the architect from BOGL comments, the importance of water management truly shines through in the project, as reflected with the amount of water expert present during group

meetings (Schmidt, pers. comm.). The Copenhagen Cloudburst Management Plan certainly gives this perspective a strong mandate.

An important actor within the water occupational community is HOFOR, the utility company. HOFOR is responsible for managing the handling of surface water on public land. Accordingly, they play an essential role in the Strandboulevarden project, mainly with regards to coordinating the relief of sewers with HOFOR's cloudburst tunnel and the surface project on Strandboulevarden (Hede, pers. comm.). Furthermore, they are the organization with the best knowledge about the existing pipe systems (Hede, pers. comm.). This knowledge is key in this type of projects where the surface and underground solutions are to complement each other (Hede, pers. comm.). Practitioners from HOFOR arguably view the project through a 'hydraulic lens', whereby every design step in this project ought to be hydraulically founded, as aforementioned.

For the occupational community of water management, a pressing challenge in the Strandboulevarden project is the amount of (rain)water that needs to be cleaned and that there is not a lot of space to do so (Toke, pers. comm.; Hede, pers. comm.) (see Chapter 6). There are lots of underground pipes, such as district heating pipes, which are in the way and trees which will have to be cut down in order to make space for the technical solutions. Toke (pers. comm.) from Orbicon argues that the best solution would be if they were allowed to use purification wells as the 'good' solution, instead of purification basins with mulch filters because these take up a lot of space. However, the fact that there are no urban space funds implies that there are a lot of things they are not allowed to do, as will be further examined in Chapter 6. Yet, when asked to which extent the missing urban space funds influence their work, Toke (pers. comm.) admits:

"*We are just the engineers, we don't really care, we just need to get space for our water, and if there is space for that, we are satisfied [...] but therefore one still wants to make a project, which gives value to others than just HOFOR.*"

(Toke, pers. comm.)

In effect, the responsibility of this occupational community in the Strandboulevarden project is to ensure that there is space for the water and that the solution is technically viable. This also implies that according to this occupational community, it is "*someone else's job to get the technical solutions achieved within the framework of a good urban space"* (Toke, pers. comm.). This exemplifies the delimitation of the water management practitioners. Still, it seems that the water practitioners are aware that the urban spatial aspects are important to consider as well.

The complexity of this type of projects is still a new discipline within CKT. Hede (pers. comm.) explains that although the City of Copenhagen is used to make surface solution projects - that is, urban space projects which are primarily focused on making something nice and functional in addition to handling traffic or the like - the complexity increases drastically as soon as water becomes involved (ibid.);

"When you add water to the equation, it becomes a very complex process. Here you must have respect for water; it just doesn't have the same willingness to cooperate as other urban functions. Water can't be moved the same way as other things; it is conditioned by the laws of nature and thus doesn't adhere to administrative boundaries."

(Hede, pers. comm.)

This quote highlights how the water occupational community see water as an essential yet complex element to deal with in urban planning. The handling of water is an issue in all cloudburst management projects, yet in Strandboulevarden questions such as: "*What functions must the urban space encompass, what can we actually use it for?"* (Hede, pers. comm.) are of particular importance. As Hede explains, "*I sit and assist especially in the framework of what we do, what are the conditions for what we perform and what is the quality it must be performed for. My function is a form of framework setting and quality assurance role in this Center*" (Hede, pers. comm.). Hede thus has a critical position as the mediator of the water perspective and a translator of the technical premises that HOFOR and Orbicon present during project group meetings. Here, Hede has functioned as a key advisor for both the project coordinator from CKT, Bjørneboe, but also to assist the landscape architect consultants from BOGL in understanding the requisites and rules imposed by the Co-finance Note and Hydraulic Note, which is the hydraulic framework setting of the project (ibid.). As such, the practitioners of this community are aware that other urban functions ought to be considered, yet, it also remains clear that these must be dealt with based on the premises of water.

In order to get a better understanding of the various dilemmas and perspectives influencing the occupational community of water management, an example of the technical requirements for water purification will now be examined - and further elaborated upon in Chapter 6.2.

As the water expert from CKT explains, in principle, a water purification basin should not be trespassed, and that the fauna and flora which can be planted in such an area is very limited (Hede, pers. comm.). These are just a few of the environmental requirements that limit the architectural design and use of the urban space, and which hence represent a dilemma. As Hede (pers. comm.) sees it, there are two solutions to this challenge. One would be to get Water and EIA to loosen up the technical requirements about how big an area is needed for water purification, or another solution would be to find a more advanced purification technology (ibid.). A change to the environmental requirements is extremely unlikely, Hede explains. Yet, a more effective technology does exist - a calcium-based purification membrane. Unfortunately, however, the project group is still debating the extent to which this technique can be financed through co-finance funds as it is a subsurface construction. This would require HOFOR to finance something extra, which is unlikely as there is no real incentive in this for HOFOR (ibid.). This example illustrates the different argumentations and means deployed by the occupational community, how they seek to challenge the institutional frames and how different practitioners within the occupation community act differently depending on which organization they are a part of.

The above-mentioned examples illustrate the multiplicity of perspectives, norms and practices with regards to water management. It has been shown that depending on which organization and occupational community the practitioners belong to; their understanding of water management might differ. Although the water management occupational community have a predominant role in the Strandboulevarden project, the project is still physically located in an urban area of the city, suggesting that spatial considerations ought to be taken. Accordingly, the urban space occupational community will now be examined.

5.1.3 The Urban Space Occupational Community

There are numerous conditions that apply in a public space, which must also be considered in cloudburst management projects (Torgard, pers. comm.). In this study, the following sub-groups are considered as part of the urban space occupational community: landscape architecture and architecture professions and civil society since they are central in ensuring the incorporation of a spatial consideration in the cloudburst management project on Strandboulevarden. Overall, focus for the urban space occupational community is on getting the urban space qualities brought forward as much as possible. Yet, each profession has a distinct role and use different tools. Thus, the role divisions and tools diagram developed by CKT (presented with a visualization, Figure 21, in Chapter 4.4) is used to give examples of how practitioners within the different sub-groups might think and act. Although some practitioners within the urban space occupational community defined in this thesis do not come from CKT, the role division diagram (Figure 21) gives a good overview of the differences in values and beliefs. The specifics will be examined separately in the following sub-sections.

In the following, the relevance of each sub-group will be presented, and their main beliefs and viewpoints highlighted through examples of concrete actions taken by the practitioners. As a note, citizens and the Local Committee Østerbro are considered as part of this occupational community although they are not per say professional practitioners, yet it is deemed that they have played an important role for the development of the urban space aspects on Strandboulevarden. Hence, their perspectives are analyzed first. Lastly, although it is a simplification to present these varied professions within the same occupational community, this is done to facilitate the analysis of an ideal type focused on urban space in the case of Strandboulevarden.

Civil society and their role in changing Strandboulevarden

The role diagram (Figure 21, Chapter 4.4) specifies the role of urban life and people, where citizen engagement and participation are emphasized, as accentuated in the 'Common Copenhagen' vision (*Fælles København*) (Københavns Kommune, 2015b). This group is arguably represented in this project by the active citizens in the area and by the Local Committee Østerbro.

As Laursen (pers. comm.), the leader of the Technical Committee for Urban Planning, Technology and Environment in the Local Committee of Østerbro explains, idea generation for changing Strandboulevarden have been going on for long, starting with initiatives taken by local citizens in the early 2000s - long before CKT came into existence. As was mentioned in Chapter 4, there was a wish amongst locals to minimize the emphasis on Strandboulevarden as a road for cars, but rather to accentuate the potentials for a new urban area. Accordingly, the Local Committee Østerbro developed seven prioritizations for Strandboulevarden, including active citizen engagement, handling of parking spots, and a wish to have green areas on the 'sunny (east) side' of the boulevard (Laursen, pers. comm.) - as will be further examined in Chapter 6. Certainly, civil society have - before the official Strandboulevarden project even started - emphasized the urban qualities of the boulevard. Their inputs and thoughts in effect guided the development of the Program at CKT. Unfortunately, however, the co-financing framework meant that numerous of their propositions are no longer possible and a concrete citizen engagement process - which the municipality usually does in similar projects - has also not been possible here due to the missing funds (Bjørneboe, pers. comm; Hansen, pers. comm.). Still, their initial ideas set the framework on which the practitioners at CKT commenced the project.

The municipal urban space practitioners

According to the role diagram (see Figure 21 in Chapter 4.4), architects make analyses of the characteristics of a specific place, looking at urban life parameters and applying policies such as the Copenhagen Architecture Policy (*Arkitekturpolitik København 2017-2025*) (Københavns Kommune, 2017b). Landscape architects focus on landscape qualities and urban nature, using policies such as the Tree Policy (*Københavns Kommunes Træpolitik 2018-2025*), which up-prioritizes existing and new trees without hindering urban development (Københavns Kommune, 2018), as well as the Urban Nature Strategy, which integrates green aspects in climate adaptation projects (Torgard, pers. comm.). Certainly, there is a focus on the aesthetics and the holistic. This profession becomes further emphasized via the involvement of the landscape architects from BOGL - who will be presented below.

Hansen (pers. comm.), architect working at CKT, recalls how numerous questions arose when setting the framework for what ought to be included in the Program for Strandboulevarden (CKT, 2018). The queries were primarily about how the urban space aspects were to be included in a project focusing primarily on minimizing the risk of floods (Hansen, pers. comm.). Torgard (pers. comm.), architect in the project group for Strandboulevarden project at CKT and co-producer of the Program, furthermore explains how the spatial elements were emphasized when writing the Program by using framing documents such as Copenhagen's Architecture Policy (Københavns Kommune, 2017b) and the City Nature Strategy (Københavns Kommune, 2015a) to emphasize the importance of urban space, which else is at risk of 'disappearing' due to the priority given to the hydraulics (Steffensen, 2014).

> *"We actually go in and use the tools that we have. So, for instance, we have that tool 'Better Urban Space' [strategy] and the Architecture Policy which contain some of the concepts we are talking about and that we want to use here. Still, concepts such as 'added value' can mean many different things. 'Recreational value' is already a charged concept.* [...] *We are very aware of which words we use."*
>
> (Torgard, pers. comm.)

In fact, these tactics bring forth the urban space aspects as being - as much as possible - equally important to the hydraulic functions even though there are no urban space funds available. As such, these politically approved frameworks, plans, and strategies as well as the early citizen participation and conscious use of specific concepts and words serve as a regulatory leverage point of the urban space perspective at CKT. Indeed, the above quote shows how the practitioners are able to use different tactics, such as language, tools, documents, etc. as a means by which they can push forward their agenda (Chapter 2).

As mentioned in Chapter 4.2, the fact that CKT has a Framework Agreement (*Rammeaftale*) for Parks and Urban Spaces which states that they are looking specifically for a team consisting of a landscape architect firm together with an engineering consultancy firm to complete a given task (CKT, 2018), indicates that spatial planning is a priority for CKT and Copenhagen Municipality as an organization (Hede, pers. comm.). Indeed, the architect and landscape architecture practitioners at CKT have strived intensively at integrating rhetorical tropes and highlighting the influence of cultural artifacts as a way to shape action in accordance with their ambitions (Chapter 2). This is done in order to persuade the consultant firms of the importance of thinking about the urban space in the process of planning the cloudburst management project on Strandboulevarden (Torgard, pers. comm.; Hansen,

pers. comm.; Ørsnes, pers. comm.). As Torgard (pers. comm.) argues, surface solution cloudburst management brings forth new rhythms to the city's space, which must be sought for when planning cloudburst management projects such as Strandboulevarden.

> *"We have different rhythms in the city, some are about traffic, some about pedestrians, and commercial life, etc. But natural processes - such as the water cycle - are also part of some rhythms that characterize urban life. So while the retention basins might be empty most of the time, their function and hence the rhythm of the area will change when it rains. Water makes people act differently."*
>
> (Torgard, pers. comm.)

This suggests the need for a much deeper understanding of the situation at hand by the consultants in the Strandboulevarden project than what is needed in 'normal' cloudburst management projects. Consequently, the perspectives of the landscape architects from BOGL will now be analyzed.

The urban space perspective as seen by the consultant firm

As mentioned above, the role diagram (Figure 21, Chapter 4.4) states that landscape architects focus on landscape qualities and urban nature. In effect, As Schmidt (pers. comm.) explains BOGL is a landscape architecture firm that would not be able to stand for a project where there was no focus whatsoever on the aesthetic and creative aspects - just as the municipality cannot accept bad quality solutions, as the various political agendas and strategies highlight, e.g. the Architecture Policy (Københavns Kommune, 2017b).

Cloudburst management on the surface is a relatively new technique. Accordingly, no one at BOGL - the landscape architecture firm on the project - has (yet) extensive knowledge about working with cloudburst management projects (Schmidt, pers. comm.). In this project, where the water aspects represent almost 80 percent of the project, Schmidt (pers. comm.) explains that she would have liked to be better equipped. Still, the profession of landscape architect has multiple facets and one needs to know a little bit about everything and as Schmidt (pers. comm.) notes, she will now be better equipped for future projects. "*Personally, I find it really interesting because there is so much technical in it. And this thing about the terrain elevations and water which apparently can only flow downwards"* (Schmidt, pers. comm.). This shows how the practitioners in this sub-group of the occupational community of urban space have to think differently, as the spatial aspects are physically constrained because of the natural flow of water for instance, which sets specific requirements for which kind of solutions the urban space practitioners are to deliver.

In effect, BOGL have been creative with their drawings in trying to meet the various requirements set by CKT, HOFOR and the Utility Secretariat at the same time as ensuring the presence of the urban space focus. Schmidt (pers. comm.) explains how they have been given cues by Orbicon, HOFOR and CKT but have also come up with some suggestions themselves of the 'good' solution through their drawings. An example thereof will be presented in detail in in Chapter 6. Yet, clearly it is not an easy task, since *"we have some stuck ideas about what an attractive, recreational, urban space or urban landscape is. These ideas are not quite up to date about what features such a space actually needs to accommodate*" (Torgard, pers. comm.). Nonetheless, the landscape architects at BOGL strive to get as far as possible with the limited funds available.

"Of course, we adhere to the given constraints. It isn't something we have decided, neither has anyone at the municipality, nor at HOFOR. No one wants to just make something ugly. They are just only allowed to give money for minimum solutions, and therefore one also has to define what a minimum solution is. That is insanely interesting, because there is actually no one who knows exactly what can be done."

(Schmidt, pers. comm.)

Indeed, one could argue that Strandboulevarden represents an opportunity for the urban space perspective to re-brand, re-think and re-configure itself - whereby the regulations and constraints at hand are to be taken as an opportunity to bend, design and re-think the existing norms and methods within the urban space occupational communities across the organizational field (Hansen, pers. comm., Torgard, pers. comm., Schmidt, pers. comm.). The significance of these different tactics differs depending on how they are articulated and embodied by practitioners. "*By changing the category of the space*, *we change some of the rules, norms, etc. and apply new norms about how we perceive the urban space"* (Torgard. pers. comm.). In effect, by planning for a 'green park stretch' on Strandboulevarden, the urban space changes character from being solely a road to becoming an urban space with multiple functions; water retention, traffic, recreational, etc. (ibid.).

Holistic thinking

An important consideration made by various practitioners within the urban space occupational community is the fact that only a minor part of Strandboulevarden is considered in this project. "*It is a shame"* as Hansen (pers. comm.), sees it. The Local Committee Østerbro also argue that Strandboulevarden should be looked at in its integrity (Laursen, pers. comm.). Strandboulevarden is one of few boulevards of Copenhagen and by having a project focusing only on a third, or less, of the urban space, the character will be significantly changed (Hansen, pers. comm.). As a practitioner interested in the spatiality of urban spaces, Hansen sees the missing urban space funds as a distinct hindering in creating a coherent and complete urban space. "*Cutting down trees and so forth will feel like a hole in a tooth row, and reduce the potential for creating a connected urban space as you would be able to if looking at it holistically*" (Hansen, pers. comm.). In effect, by choosing the 'cheap' version, the urban space quality is at risk of degradation. Hansen questions the extent to which the urban space of Strandboulevarden can be upgraded after completion. "*You cannot just sprinkle on top with some benches and basketball field, there needs to be an overall plan*. *And then there is the risk that it becomes a strange stretch on an otherwise assembled urban spac*e" (Hansen, pers. comm.). This quote illustrates how the practitioners in the occupational community of urban space focus extensively on the spatial aspects, taking a holistic approach to viewing the cloudburst project as a part of an urban redevelopment of a whole area, rather than seeing it in isolation specified to the small area where the project is to be executed. As such, the occupational community focused on urban space emphasizes the importance of thinking holistically and of considering the various aspects at play.

Conclusively, the above exemplifications have demonstrated how the urban space occupational community - consisting primarily of architects, landscape architects and civil society practitioners across the organizational field involved in the Strandboulevarden project share convictions, ideals and assumptions and use different means to shape action according to their agenda about what is to happen to the urban space on and around Strandboulevarden. The financial constraints which prioritize the hydraulic aspects force this occupational community to think creatively and to find new

and innovative ways in which the spatiality is thought for - this is done differently by the practitioners within this occupational community, yet the overall focus on urban space remains common.

5.2 The three Entangled Institutional Logics in the Strandboulevarden Project

The three above described occupational communities are, as mentioned, ideal types, suggesting simplified and analytical representations of the institutional logics based in empirical observation. When individuals identify with the shared identity of the social group they belong to, they presumably cooperate with this social group, stand for its norms and prescriptions and strive to defend the interests of the collective and its members against competing identities (Thornton and Ocasio, 2008; Chapter 2). Accordingly, the institutional logics which become apparent through these occupational communities will now be brought forth, as these will guide a further analysis of how these different logics materialize through everyday practices, as will be further elaborated upon with the examples presented in Chapter 6. The intention being to demonstrate how practitioners can work towards the creation of the 'good' solution in climate adaptation projects without urban space funds.

The competencies and mindsets of different professional backgrounds are needed when seeking to climate adapt an urban space (Chapter 2). The diverse institutional logics behind the different professional backgrounds - as found through the empirical data collection, will now be presented and their influence on the practice of climate adapting Strandboulevarden will be examined. As mentioned in Chapter 2, institutional logics can be defined as:

> *"the socially constructed, historical patterns of material practices, assumptions, values, beliefs, and rules by which individuals produce and reproduce their material subsistence, organize time and space, and provide meaning to their social reality."*
> (Thornton and Ocasio, 1999: 804, cited in Thornton and Ocasio, 2008)

Accordingly, the three dominant logics identified in this project are reflected by the occupational communities presented above as well as through the analysis in Chapter 4. Accordingly, the logics identified are the institutional logics of water, urban space and finance, which are presented in the below table with examples of values and ambitions and the institutional (regulatory) frames having an influence thereupon (Figure 23).

Figure 23 Examples of the different institutional logics enacted by practitioners from the different organizations (own table)

Institutional Logic	Organization(s)	Values and ambitions	Institutional (regulatory) frames
Water	CKT and HOFOR	Secure Copenhagen against floods and from sewage in basements	Cloudburst Management Plan and Climate Change Adaptation and Investment Statement
Water	Water and EIA	Appropriate water quality at outlet	EU and Danish directives about water quality
Water	Orbicon	Best technical water handling solution given the existing space constraints	Procurement materials from CKT (Hydraulic Note and Program)
Finance	CKT	Cloudburst management within the approved financial frame	Application to the Utility Secretariat and Project Package 2016
Finance	CKT, HOFOR, BOGL and Orbicon	Hydraulically founded, minimum solutions	Co-finance Notice
Urban Space	CKT and BOGL	The creation of a 'good' urban space, i.e. functional, recreational, aesthetic and sustainable	Program, Architecture Policy, Better Urban Spaces, Common Copenhagen, Tree Policy
Urban Space	Local citizens and Local Committee Østerbro	The creation of a locally anchored 'good' urban space	Democratic mandate, Common Copenhagen

In the following Chapter, examples of situations were logics seem to collide will be elaborated upon. The focus being to shed light on the everyday practices and activities of the practitioners faced with institutional complexities. As such, the logics' influences on actions and the practitioners' maneuvers will become apparent.

6. Navigating the Complexities of Urban Space, Water Management and Finances

As described in Chapter 4, execution of the Cloudburst Management Plan requires involvement and action from an assemblage of actors which, as presented in Chapter 5, have various prevailing logics that could pull the solution in different directions. This chapter delves into the complexities that happen when an array of actors negotiates towards a 'good' solution. Thus, this chapter answers the third research sub-question: *"How do practitioners, through everyday activities, navigate the institutional complexities of the project?"*. Specifically, this chapter analyses how the identified institutional logics from Chapter 5 are materialized in the practitioners' everyday activities. According to the institutional logics perspective, different logics can co-exist, as already shown with the identified logics within Strandboulevarden project (Chapter 2 Theory; Chapter 5). These different institutional logics are not necessarily in conflict, but some friction might occur which can result in difficulties. Accordingly, by using a Practice-Driven Institutionalist approach, this analysis will further an understanding of how practitioners can act based on different institutional logics.

The Institutional Complexity of Strandboulevarden

The following examples are exemplifications of situations where institutional complexities occur as a result of co-existing institutional logics, which given the situation, are seen as colliding within the project and organization. In these situations of institutional complexity, practitioners take agency and try to navigate the co-existing logics in their everyday professional practice (Chapter 2, Theory). In Strandboulevarden, the strict purview that the absence of urban space funds constitutes, creates emphasis on the importance of balancing and utilizing different professional logics. The foundation of which the solution must be based is dictated by building stones from an array of professions. It is not possible to create a solution whose main purpose is to be an attractive urban space and only secondary to manage cloudbursts. In effect, all aspects must be justified from a water management perspective (Bjørneboe, pers. comm.; Hede, pers. comm.). The following examples are situations that investigates exactly these complexities.

6.1 Where Should the Solution be Placed?

During the long process of the Strandboulevarden project, a recurring theme has been whether to place the cloudburst solution on either the western or the eastern side of the boulevard and how big a part of Strandboulevarden should actually be a part of the project. Through the process, there have been several arguments and justifications for exactly why the solution should be placed on one side instead of the other. These arguments and justifications are grounded in different logics within the organizational field, presented in Chapter 5. From an urban space perspective, one thing might be particularly beneficial while from a water management perspective the exact opposite might be the right solution. The different argumentations for placing the solution in either the eastern or the western side show different representations of the identified institutional logics, and it is up to the practitioners to navigate and utilize these logics to creation of the 'good' solution. To understand how and why the three logics have influenced decisions and solutions through time, significant events where the logics have had a significant influence on this placement are identified and analyzed. The following will go through these important situations in which the east and west discussion has been

unfolded and analyze the decisions made, the argumentations, and their significance. Afterwards, a more detailed description of the east and west discussion as it is unfolded today is analyzed to see how practitioners navigate this specific institutional complexity.

6.1.1 Local Citizens call for New Urban Spaces on Strandboulevarden

Urban space aspect has been present in connection to Strandboulevarden for a long time. Especially the placement of the solutions has changed. As explained, in the former process, local citizens groups created proposals for the refurbishment of Strandboulevarden (CKT, 2018). In the project proposal pamphlet from 2007, it was argued that Strandboulevarden is the backside of Østerbro, with little urban life and no recreational possibilities. Thus, refurbishing the area based on the visions of the local group, would be a place of joy for local citizens since it would bring a higher quality of life (Østerbro Lokalråd et al., 2007). More specifically, the vision entailed four different types of recreational urban spaces placed along the stretch of Strandboulevarden (Chapter 4). It is difficult to imagine these visions being carried out in the project as it is today, since the project is under strict frames. Nevertheless, the early visions clearly stated a local wish for reconfiguring the urban infrastructure. At that time, it did not seem as if cloudburst management was at the table, but it is also important to note that this happened several years before climate adaptation really became part of the urban development agenda - following the destructive cloudburst of 2011. Regarding the placement situation, the vision entailed the placement of a long green path in one side of the road on the entire stretch of Strandboulevarden.

The project proposal is clearly based on an urban space logic, emphasizing the need for different urban spaces that serve multiple recreational purposes. As Albrechts (2004) states, it is through the planning process that values and images of what a society wants to achieve is defined. Indeed, this project proposal defined the citizens' vision of a long stretch of recreational urban spaces substituting the traffic infrastructure on one side of the road. Whether this it at all possible to implement in the project under the current conditions is a difficult task, which represent one of the main institutional challenges faced by planners; the task of trying to balance the development aims of specific individuals and groups with the broader societal needs (Mathews, 2013).

6.1.2 A Surface Solution on one side of Strandboulevarden

Following the development of the Climate Adaptation Plan and the Cloudburst Management Plan, as described in Chapter 4, the City Council of Copenhagen had to decide the overall method for the cloudburst management of Inner Østerbro - as well as in the other catchment areas of Copenhagen - based on suggestions from the Technical and Environmental Administration (Københavns Kommune, 2013). The Administration suggested that the cloudburst management on Inner Østerbro should be carried out according to one of two main principles (ibid.):

1) A combination of open solutions and pipes, where the water from the streets runs to a big pipe, that is established beneath Strandboulevarden with outlet to the harbor. In this solution, there could be established surface solutions that retain and delay the water.

2) A combination of open solutions and pipes, where the water from the streets is lead to Strandboulevarden, where rainwater, in both everyday situations and at cloudbursts, is collected in a green and blue park stretch in one side of the road. The societal need of securing against flood is clearly imprinted in the future development of Strandboulevarden with this decision. Furthermore,

the long process of defining how exactly to place the solution starts here, when Strandboulevarden is pointed out as the main infrastructure to secure Inner Østerbro against floods.

It was decided to follow the second principle, where it is suggested to place a surface solution on one side of the road (Københavns Kommune, 2013). This solution was chosen since the surface solutions gives the greatest robustness against changes in climate conditions and gives the greatest possibility for more value in the form of a greener city (ibid.). This entails both a water logic and an urban space logic, since the suggestion was justified from both a water management and an urban space perspective. Furthermore, the administration argued for the second principle from a financial perspective, since this solution would be the most economical beneficial.

Consequently, the argumentation for the chosen principle for the cloudburst management on Strandboulevarden is influenced by all three logics, but mainly driven by the water logic, since the main purpose is to define a main solution to secure Inner Østerbro against floods. It is important to note, that at this stage, the project of Strandboulevarden is not defined, but the overall principle for the cloudburst management is. This indicates that the principal solution for cloudburst management on Strandboulevarden pointed towards a holistic approach where water management and urban space were combined on one side of the road. Utilizing the theoretical framework, this can be described as co-existing logics without any friction to create an institutional complexity.

In 2015, the City Council approved 16 projects, including the project of Strandboulevarden. The solution was defined as a 1670-meter-long combined cloudburst and delay-road on the west side of the road with subsurface cloudburst pipes (Københavns Kommune, 2015d). The solutions is defined as a green park stretch on the western side of the road. In connection to the political decision, the Administration, furthermore, stated that there were possibilities for further urban space improvements in connection to this project. Accordingly, they stated that they were going to apply for 180 million DKK at the budget negotiations for 2016, with a proposal to establish an entire new urban space with a focus on urban life and urban nature (ibid.). It was thus presupposed that the project would be allocated urban space funds.

6.1.3 Different Scenarios for the Placement on Strandboulevarden

As described in Chapter 4, funds were allocated for a feasibility-study in order to investigate the possibilities for uniting cloudburst management, urban space, traffic and parking on the entire stretch of Strandboulevarden (Hansen, pers. comm). The study was initiated with the purpose of applying urban space funds for the project at the future budget negotiation for 2017 (Københavns Kommune, 2016b). Thus, this study was quite important to show the possibilities for a future recreational urban space on Strandboulevarden, and not least the specific placement on Strandboulevarden.

The Administration developed a feasibility study with three scenarios for a park stretch on the entire Strandboulevarden with aide from the Niras, SLA and Viatrafik consultants (Københavns Kommune, 2016b). Hansen (pers. comm.) explains how they received 1.5 million DKK to conduct the feasibility study where they examined how a holistic solution would look, without seeing hydraulics as the biggest issue. Rather, they looked for a coherent solution that the citizens and the city could be happy about (Hansen, pers. comm.). The three scenarios had different suggestions for the placement of the solution on the road (see Figure 24):

Scenario 1: it is placed in the Eastern side,
Scenario 2: the solution is placed alternately on the eastern and western side,
Scenario 3: the solution is placed in the middle.

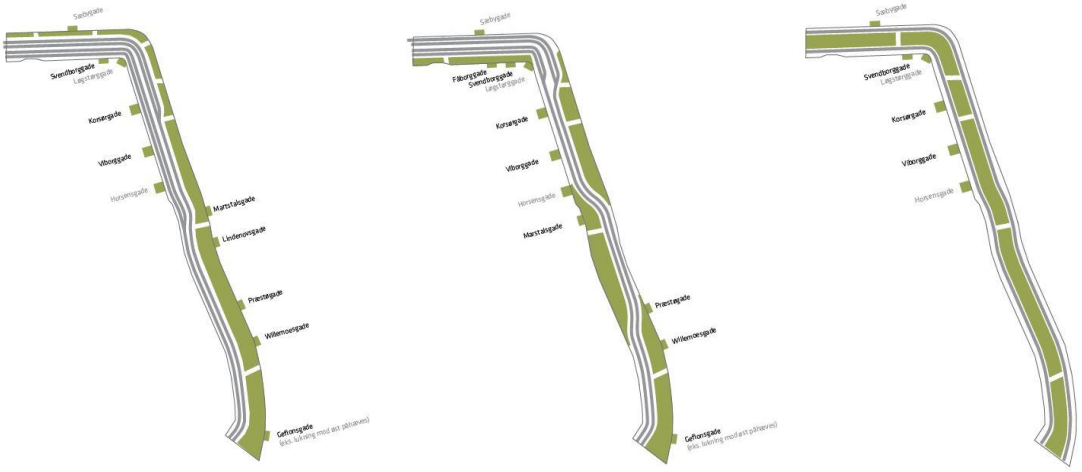

Figure 24. Visualizations of the three different suggested scenarios 1,2 and 3. (Niras et al., 2016).

The Administration suggested to continue to work with Scenario 2, though with a delimited project boundary. This suggestion was based on several arguments and logics. It was suggested to put a broad park stretch along the facades alternately on the east and west side. The park stretch was placed so that it would have a link to the existing urban life and building functions on both sides of Strandboulevarden (Københavns Kommune, 2016b). Furthermore, Scenario 2 had a better cleansing of the rainwater than Scenario 1. Though the cleaning of rainwater was assumed just as good in Scenario 3. Scenario 3 is placed in the middle of the road and thus would have no connection to existing life on the two sides of Strandboulevarden (Københavns Kommune, 2016b). Furthermore, the stretch from Østerbrogade to Middelfartsgade was suggested removed because it only had an insignificant capacity for handling rainwater on the surface.

These different argumentations show how the practitioners utilize different logics to argue for different solutions back in the early stages of the project development. At this stage, it was still presumed that the project would be allocated urban space funds at future budget negotiations (Københavns Kommune, 2016b). The water management logic does not seem to be prevailing at this stage, hence, the development of these three scenarios was grounded in completely different frames than the future scenarios developed by the current consultants, as will be presented later in this chapter.

Also, as an important aspect, the Local Committee of Østerbro was notified during the process and indicated that they preferred a park stretch along the facades as in Scenario 1 or 2, and definitely not a solution in the middle of the road, since this would not make sense urban space wise (Københavns Kommune, 2016b). Thus, the Local Council definitely adheres to and enacts according to an urban space logic where local desires are promoted in relation to the available scenarios. In this regard, the two scenarios supported earlier visions of the facades being coupled to the blue and green infrastructure of the future urban space on Strandboulevarden (Københavns Kommune, 2016b). Table 5 below summarize argumentations and their grounded logics.

Table 5. Show the different suggestions and argumentations for choosing scenarios 2 at the given time.

Actor	Suggestion	Argument	Logic
TMF	Scenario 2: A green park stretch alternately on the eastern and western side.	Connection to existing urban life on both sides	Urban Space
TMF	same as above	Scenario 1 is worse waterwise	Water management
TMF	same as above	Scenario 3 is the worse traffic wise.	Urban Space
TMF	Limiting the project area from whole of Strandboulevarden to a smaller stretch	The removed stretch will only have an insignificant water management function. This will also make the project cheaper	Water management Financial logic
Østerbro Local council	Scenario 1 or 2	facades being coupled to urban space of Strandboulevarden	Urban Space

Accordingly, the Technical and Environmental Committee were notified that the Administration could continue to work with Scenario 2 (Figure 25).

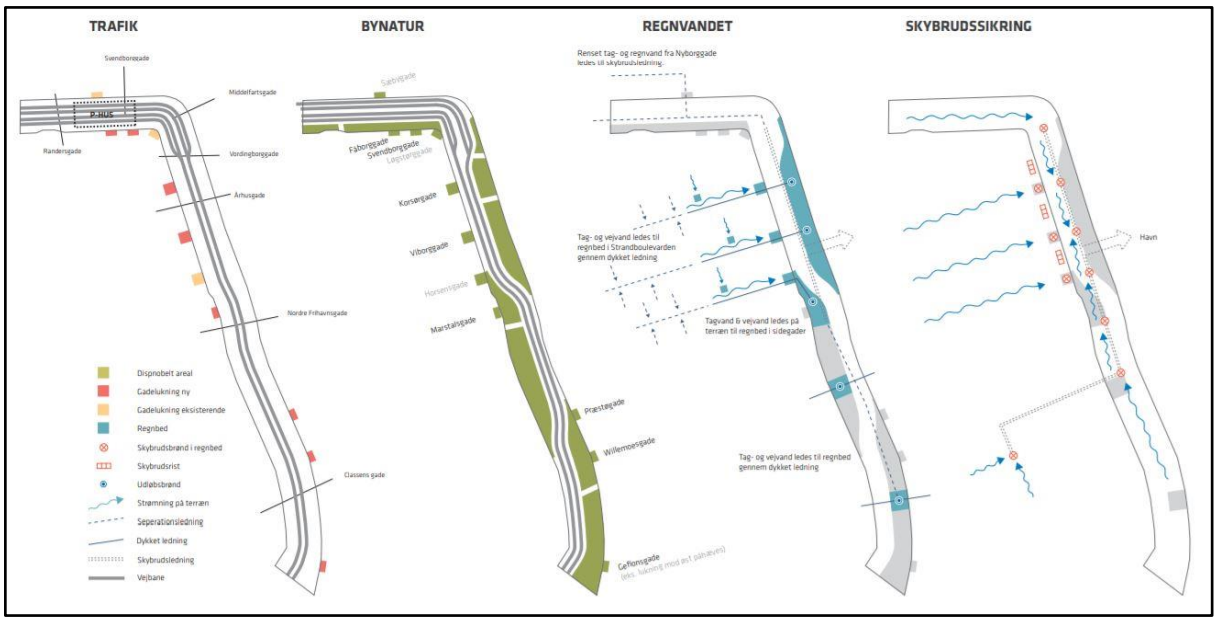

Figure 25. A visual presentation of the scenario 2m from the feasibility study, which was chosen to continue developing on (Niras et al., 2016).

The above Figure 25 shows the Scenario 2 that was decided to continue to work with. It should, however, be noted that they continued to work with a limited project boundary that cut of the top part going west (from Middelfartgade). It is clear to see that the solution would benefit both sides of Strandboulevarden, and thus giving existing urban life on both sides of the road the possibility to utilize

the new urban spaces. Since the scenario presumed the allocation of urban space funds, applications requesting urban space funds was sent several times (Hansen, pers. comm.).

In the further development of the proposal, they leaned on some of Copenhagen's strategies such as 'Better Urban Space' and the overall urban development strategies (Hansen, pers. comm.). This turned into a concrete proposal that was presented for the politicians, which would cost a lot of urban space funds. As Hansen (pers. comm.) elaborates, the solution also included re-establishment of the road, which is very worn down, as well as an upgraded bike path. She furthermore states, that they emphasized that a lot could be saved by doing more things at the same time, as an attempt to activate different funds (Hansen, pers. comm.). But "*it was turned down, and then we were asked to focus on where it was most necessary regarding the water*" (Hansen, pers. comm.). Accordingly, it would seem that the water logic started taking a leading position.

6.1.4 Cloudburst Project with No Urban Space Funds - the Hydraulics taking over

In Chapter 4.2, is was described how urban space funds were applied for several times. Twice, the Technical Administration applied for urban space funds, arguing that this was an opportunity to create synergies between the cloudburst solution and the urban space (Københavns Kommune, 2017a). The City Council did, however, not allocate any urban space funds for the cloudburst project of Strandboulevarden, in the municipal budget for 2017 (Københavns Kommune, 2017a). This political decision consequently meant that the solution could only be funded by utility funds, which implies that the possibilities for the creation of urban space would be heavily restricted.

Due to the constraining conditions, the Administration continued, after agreement with HOFOR, the work with a solely utility funded project on the surface of Strandboulevarden, as specified in the application to the Utility Secretariat (Ørsnes, pers. comm.). Since the preconditions for the project changed a lot compared to the project description in the feasibility study - which presupposed the allocation of urban space funds in the 2017 Budget - they had to develop a new concept for the water management on the road (Hede, pers. comm.). This could have the consequence of changing the placement of the solution, as will become apparent in the following elaboration. A shift in prevailing logic seems to have happened, since the preconditions for the project were changed when the allocation of urban funds was denied.

As a result, the Administration and HOFOR collaboratively developed a preliminary analysis of the possibilities for handling the necessary amount of water within the financial restrictions of the solely utility funded project (Københavns Kommune, 2017a). The further development of the project showed that it would be preferable to establish the cloudburst solution on the stretch from Middelfartsgade to Nordre Frihavnsgade, and that the water on the stretch south of there could be handled by existing pipes (ibid). Furthermore, it showed that the rainwater basins should be placed in the western side of the road on the aforementioned stretch in order to handle the required 2000 m^3 water, and because the water streams to Strandboulevarden from the catchment area by the sideroads from west (ibid). A placement in the eastern side would mean, that the water should be transported from the western side to the eastern side of the boulevard through micro tunnels which would be more expensive (Københavns Kommune, 2017a). This shows how the preconditions were changed so that the hydraulic logic and the financial logic had major influence on the placement and size of the project.

The sketch proposal, with the placement on the western side, was furthermore in hearing at the Local Committee of Østerbro, who were happy to hear that the retention basins would contribute with new green areas on Strandboulevarden. Still, they suggested that the solution should be placed on the eastern side of the road where there is the most afternoon sunlight, since this is the time of the day that most people are free from work and school (Københavns Kommune, 2017a). However, it was the administrations' assessment that they must be placed in the western side of the road for two reasons; in order to handle the large amount of rainwater; and because the rain streams from the roads from the west from where it could be directly lead to the basins on the western side.

Table 6 show the different argumentation for the different placements of the solutions (own table).

Actor	Suggestion	Argument	Logic
TMF	Placing the solution with the retention basins on the western side.	The water streams from the catchment area from the west, thus the water handling is better if the solution is placed on the western side	Water management
TMF	same	A cloudburst solution on the eastern side is way more complicated in hydraulic terms and would increase the expenses with millions	Water management Financial
TMF	same	It is too late to place it in the eastern side, since HOFOR is so far with their cloudburst tunnel, that changes in the surface project will create delays on up till 1 year.	Water management Financial
Østerbro Local committee	Placing the solution with the retention basins on the eastern side.	This will utilize the afternoon sun better where most people are off and potentially using the space.	Urban Space

Practitioners such as Hansen (pers. comm.) emphasize a need to look at the area in its integrity, arguing for a solution that covers the whole of Strandboulevarden - a solution which, however, is not possible due to the missing funds. Nonetheless, as mentioned in the Program, the solution should be one which can function as a functional urban space now and not an area that has to wait for urban space funds in the future, though it should still be possible to supplement with urban space funds in the future (CKT, 2018). Nevertheless, the reality is that the project is being developed without any allocated urban space funds, and thus finds itself in an institutional complexity where different institutional logics co-exist and might be perceived as contradicting and supplementing each other, depending on how they are utilized by the practitioners. The different augmentations for placement of the solution, be it west; east; the entire stretch of the boulevard; or on a limited stretch, reflect a notion of battle for space, where different components of the project a justified and grounded in different logics. The following is the current development process of the project, where the disposition of the project area is being analyzed.

6.2 Navigating the 'Battle for Space'

The Disposition proposal phase is, as described in Chapter 4, framed through a procurement process which involves binding and guiding documents such as the Program and the hydraulic note. These frames normally constitute a quite clear purview. However, as Strandboulevarden is a *"pilot project birthed with all childhood illnesses"* (Ørsnes, pers. comm.), the frames proved to be more fluent and changing throughout the process (Hede, pers. comm.; Schmidt, pers. comm.). Regarding the placement of the solution, the politically approved sketch proposal, as well as the Program, had the solution located on the west side (see Figure 26) due to financial and hydraulic rationales (CKT, 2018).

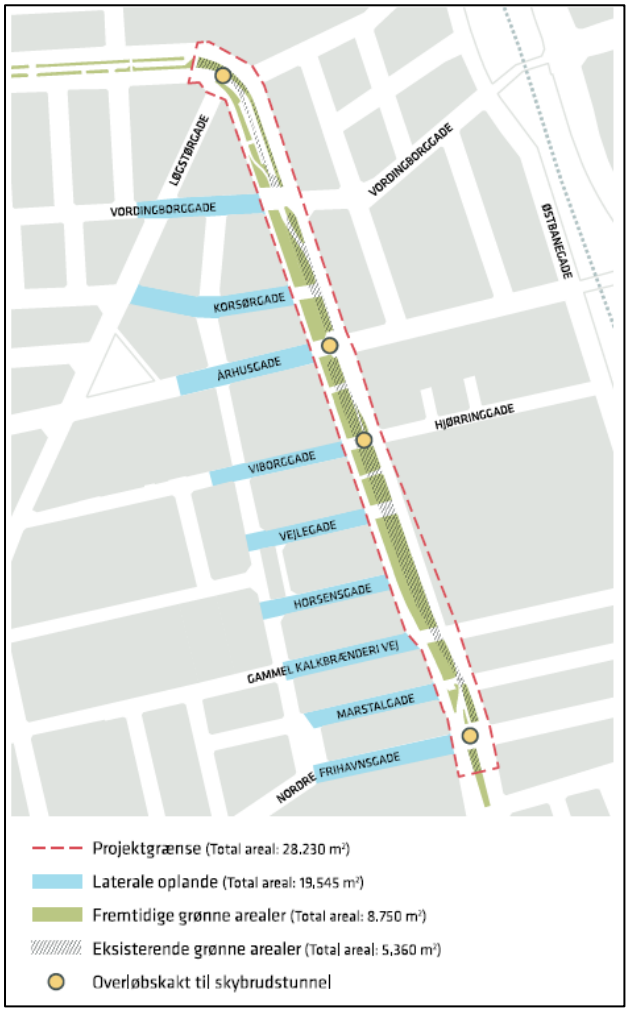

Figure 26. Illustration that shows the project area, the placement of the green surface solutions and some of the hydraulic bindings in the form of catchment areas and shafts to the cloudburst tunnel (CKT; 2018),

> *"The sketch proposal has been prepared on the basis of studies showing that the rainwater basins are best placed in the western side of Strandboulevarden, partly to be able to handle the required amount of water and partly because the rainwater will flow directly to the basins, rather than having to be transported to the east side."*
> (Københavns Kommune, 2017a)

In the Program, it is further stated that this is *"the solution which is possible within the allocated utility funds"* (CKT, 2018). The prevalence of the water management and financial logic is therefore clearly asserted at this stage through the regulative claims of the co-finance law. However, the project group that was created in connection to the Disposition Proposal phase quickly suspected that significant conditions were not taken into consideration or properly clarified in the previous studies (Bjørneboe, pers. comm.). The previous studies had in effect neither taken purification of everyday rain, the need for a fire-escape road, nor the existence and location of district heating pipes into consideration (Bjørneboe, pers. comm.; Hede, pers. comm.). These conditions were proven to be essential for the disposition of the solution. Naturally, the absence of water purification considerations in the feasibility studies is explained by the delayment of a decision taken regarding whether decoupling of everyday rain should be included in the project or not (Hansen, pers. comm.; Steffensen, pers. comm.). However, the Hydraulic Note, which was included in the Procurement Material sent to the consultants, states that everyday rain should be led to, and handled by, the project, including decoupled roof water (Bjørneboe, pers. comm.). Further, the Program includes demands regarding the purification of the decoupled water due to the roof water being contaminated with various metals from old gutters and that the water is

subsequently led to a marine recipient (the ocean), therefore resulting in environmental constraints (Hede, pers. comm.). These are in effect strict regulations which are set and imposed by Water and EIA from the City Development. Nonetheless, there is a lack of consideration of what these demands imply for the disposition of the solution (ibid.). To handle all that contaminated roof water in the project requires a lot of space (ibid.) This is especially problematic as the district heating pipes have proven to be located all over Strandboulevarden in both sides of the road (see Figure 27), exactly beneath where the surface solutions are proposed (Hede, pers. comm.). Some of the district heating pipes are less than 0.7 m beneath the surface, which means that one cannot establish basins on top, while others are 1.5 to 3 m beneath the surface (BOGL and Orbicon, 2019).

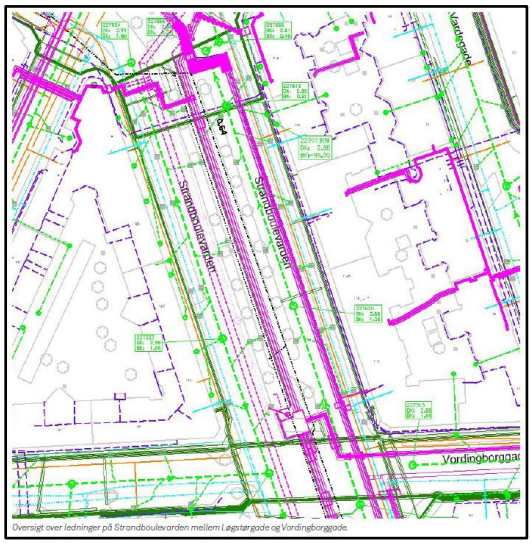

Figure 27. Technical drawing portraying the various pipes and wires beneath Strandboulevarden (BOGL and Orbicon, 2019).

Hence, for the solution to be implemented according to the proposed disposition, the pipes need to be moved, which is estimated to cost an additional 20 mio. DKK (ibid.). On top of that, there is a need to make room for a fire-escape road next to the facade (ibid.). In conclusion, these conditions resulted in a need to reconsider the disposition of the solution (ibid.). One can describe the situation as an example of how the multiplicity of logics expressed through socially constructed institutional frames collide in a 'battle for space', generating an institutional complexity which needs to be managed. But, not only does it need to be managed, it simultaneously constitutes an opportunity for the creation of the 'good' solution, as elaborated below.

The opportunity lies in a successful navigation of the different logics where ambitions, values and demands from co-existing logics are not seen as necessarily contradictory, but instead as potentially mutually reinforcing. In other words, not seeing the different demands and ambitions as a 'battle' that needs to be won. The consultants were, as a result of the above realizations, tasked with the development of different scenarios for how to incorporate a retention capacity of 2000m^3 with the new demands taken into consideration (Bjørneboe, pers. comm.; Hede, pers. comm.). In that regard, BOGL who adhere to the urban space logic, quickly developed a drawing proposal and expressed a desire to place the solution in the east side since this side is more exposed to the sun (Toke, pers. comm.). This is also in line with the desires that the local citizens had earlier expressed. However, as previously mentioned, this cannot be the sole reason and argument for locating the solution on the east side due to the financial purview. Nonetheless, BOGL actively encouraged Orbicon to make that scenario come up as the best solution; to find good arguments (Toke, pers. comm.). Fortunately, it turned out that the hydraulic models for the scenarios actually did show that placing the solution on the east side actually was the best hydraulic solution (see Figure 28), with both scenarios maintaining the service targets (Project Group meetings, 2019).

Figure 28, Illustration of the hydraulic model which depicts the extent of flooding in scenarios 1 (east) to the left and scenario 2 (west) to the right (BOGL and Orbicon, 2019).

As Toke states: *"it may be that if you from the beginning had thought that Scenario 1 was better, then you might have found arguments for it to be better"* (Toke, pers. comm.). The eastern side was preferred in relation to several aspects, such as the number of trees needed to be cut down, the number of parking lots being removed, sun exposure and other traffical aspects (BOGL and Orbicon, 2019). Thus, even though the model technician from Orbicon had seen some issues with the inclination of the road regarding placing the solution in the west side, he was surprised by how obvious the east side turned out as the hydrologically better alternative (Toke, pers. comm.). If Toke had not made the model, he would actually have seen the two scenarios as equal in relation to their hydraulic functionality (ibid.). Yet, the eastern side scenario turned out as being the best solution from a hydraulic aspect.

This indicates that other logics potentially can influence the choice of solution through the presence and work of practitioners from other occupational communities. Be that as it may, the closing argument must as excessively state as being hydrological and or financial to gain ground as dictated by the prevailing logics. As Torgard states: *"there must be, as a starting point, hydraulic justification for it, and then one can say, the consequences of putting something in may not greatly impair the traffic, accessibility, etc."* (Torgard, pers. comm.). This example, furthermore, exemplifies a situation where logics seemed to be contradictory, but which through the everyday activities of the involved practitioners were deconstructed and reassembled to be mutually reinforcing.

On the basis of the investigation of the two scenarios, the project group presented the findings to the coordination group (Project Group meetings, 2019). None of the participants had any objections to placing the solution in the east side and HOFOR stated that they were ready to accept both of the two proposed solutions (ibid.). Scenario 1 therefore became the frame for the consultants' task.

However, the problem with circumventing the district heating pipes remains to be solved before the final disposition of the surface solutions is fixed.

To circumvent the district heating pipes a maneuvering of the institutional frames and co-existing logics becomes even more crucial. This very exercise further exemplifies how the incompatibility of co-existing logics is a social construct that in this case is materialized through established practice within institutions and the initially perceived contradictory nature of the demands that other logics assert. A navigation of this institutional complexity is certainly not an easy task, especially due to the novelty of the practice of integrating water management. It just becomes more complex as water does not cooperate to the same extent as other aspects (Hede, pers. comm.) and it is further enhanced due to the logics' strengthened position in the context of Strandboulevarden. It is through this specific example that the 'water management laws'; namely, "*water always moves downhill; and a lot of water always fills more than a little water*" (Hede pers. comm) and their consequences become very concrete in that:

"a lot of water always fills more than a little and when we have a lot of polluted roof water which needs to be dealt with in the project, then that results in the need for a lot of space to deal with it […] We can always be sure of that, but it is as if we keep forgetting it a little."
(Hede, pers. comm.).

In Figure 29, one gets a good sense of the extensive spatial seizure the purification basins (depicted as yellow areas) and the additional retention basins (depicted as grey areas) prompt.

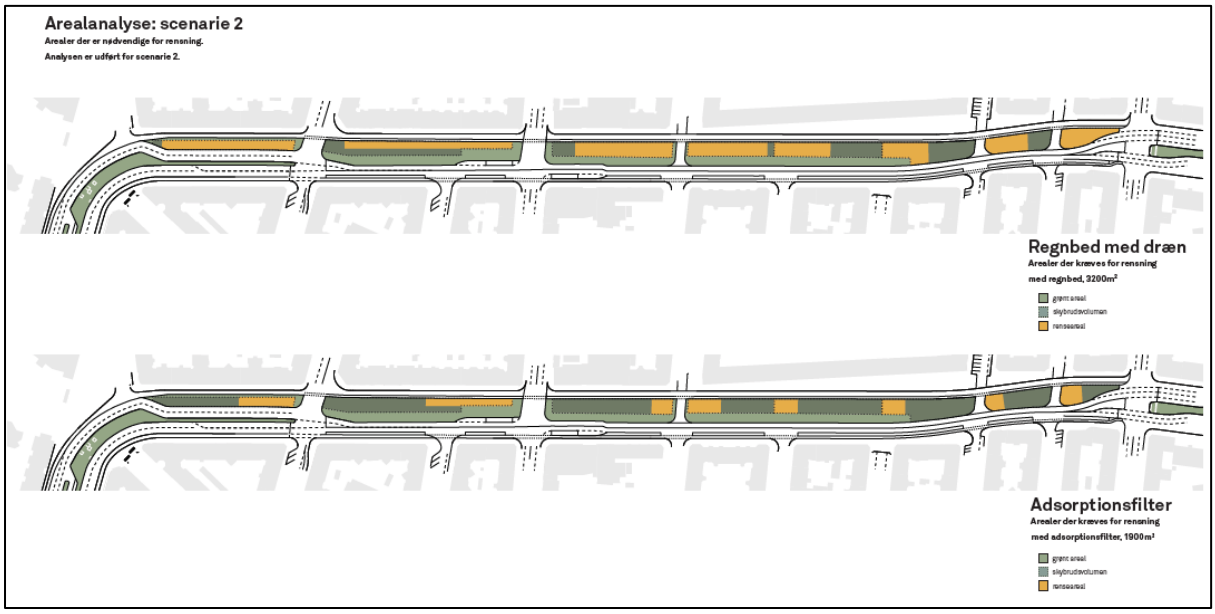

Figure 29. Drawing depicting the distribution of purification basins (yellow) and cloudburst basins (grey) on the basis of two different purification methods (BOGL and Orbicon, 2019).

As previously mentioned, some of the district heating pipes are located so close to the surface that it is not possible to establish basins on top. This poses a serious problem as the basins with a depth of 0.5 m cover a vast area (as depicted in Figure 29) to be able to fulfill the 2000m^3 retention capacity. When the consultants then on top of that were tasked with making room for a fire escape road,

different logics seemed to collide. Yet, this imposed the consultants to think creatively and to try to see things differently, which *"actually resulted in some good news"* as Schmidt (pers. comm.) explains.

In effect, when BOGL and Orbicon presented the pre-analysis for the Municipality and HOFOR, they challenged a previous statement regarding not being allowed to use the fire escape road for retention capacity. At the presentation, a municipal traffic engineer was present who could affirm that it is allowed to retain water on the fire escape road in the event of a cloudburst for a short period of time, as long as the foundation is stable (Project Group meetings, 2019). Hence, the initial perceived collision of the water management and financial logic was deconstructed and subsequently assembled to constitute a synergy effect.

Be that as it may, the grey areas, which constitute the remainder of the retention volume for cloudbursts, are - despite being spacious - not the sole or primary substance for contradiction. Foremost, the retention basins do not require the same amount and height of layers as they are not built for percolation, but for retention and diversion (BOGL and Orbicon, 2019). Therefore, the retention basins do not require to be dug much deeper than what is required for establishing the target capacity (0.5 m). The purification basins, on the other hand, require the establishment of one or two layers with a height of 0.7 - 0.8 m depending on the chosen solution which comes as an addition to the 0.5 m needed for the retention capacity itself (see Figure 30).

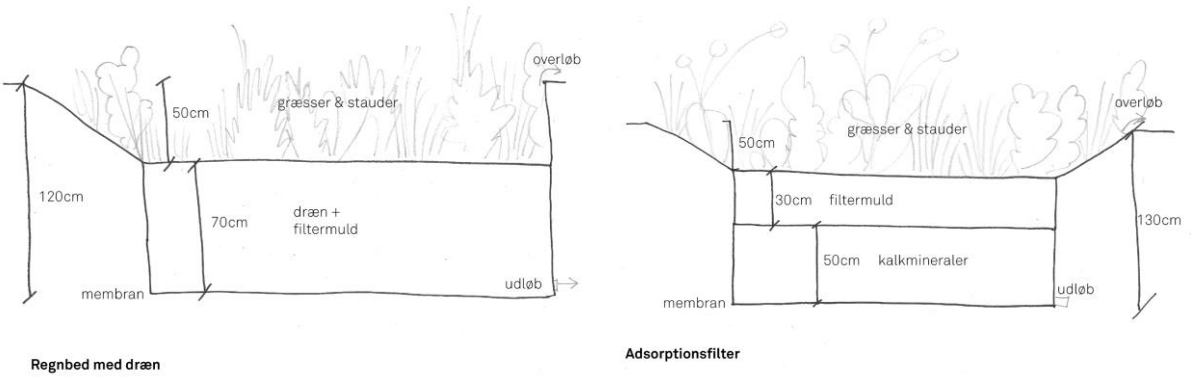

Figure 30. The Illustrations depicts two of the described purification solutions for the Strandboulevarden project (BOGL and Orbicon, 2019).

Therefore, the extensive amount of space required for purifying the specified amount of everyday rain is indeed problematic regarding avoiding the district heating pipes that lies 1.5 - 3 m beneath the surface. But, more than that *"the area reservation deprives space that otherwise could be used for making large pools or something completely different, something that does not have to do with water handling."* (Hede, pers. comm.). This is especially problematic as one is not allowed to enter the purification areas. Furthermore, the mulch filter (*filtermuld)* layer is only suited for a limited array of flora and fauna, not including trees (Hede, pers. comm.; Toke, pers. comm.). Hede (pers. comm.) portrays this as a 'battle for space' as there is a direct conflict between the functionality of the urban space and the technical solution; *"it is a technical requirement which impedes the architectural design and urban use - so it's a dilemma"* (Hede, pers. comm.). This is further reinforced by a practitioner from the urban space occupational community;

It is quite exciting, the purification problematique. It is completely [...] *fundamental for which frames we have. If there is to be purification areas to the extent portrayed* [as seen in the first solution in Figure 30], *then we simply don't have much space for plants and interior. It is a mess."*
(Schmidt, pers. comm.)

This problematique is central to understanding how co-existing logics can generate friction and even collision. However, it is also an example of how the daily activities of professional practitioners that face institutional complexity are on the forefront of instigating institutional change.

It certainly seems like a good foundation for a navigation when practitioners from the water management occupational community show an understanding or even integration of constituents from the urban space logic, as seen in the above quote from Hede and in the following from Toke; *"if you choose the purification solution that fills a lot, then we cannot plant large trees in the purification basins either. Then there is no room at all to plant that many trees"* (Toke, pers. comm.). The essential navigation in this matter, therefore, becomes to arrive at a good solution as defined by the multiplicity of entangled logics and not solely the prevailing logic of water management. The central element of this balancing act thus becomes the amount of space dedicated and required for purification, space that is not eligible for urban uses. One way to reduce the spatial extent of the purification basins is to reduce the environmental demands. The current frames entail purification of everyday rain up to a 5 year event, corresponding to 99 percent of the yearly precipitation (Project Group meetings, 2019). If one instead reduces the demand to encompass purification of a 0.2-year event which corresponds to 95 percent of the yearly precipitation, one can drastically reduce the space required for the purification basins to a third of the prior (ibid.). However, this require Water and EIA to divert from their established practice and loosen their ambitions (Toke, pers. comm.). Another way to reduce the space required for purification is to decouple less roof water from the sewers, i.e. lower the technical ambitions (Hede, pers. comm.). This is, however, problematic as HOFOR has identified a large capacity deficit in close proximity to Strandboulevarden and actually advocate for the incorporation of more flexible solutions (Project Group meetings, 2019). The consequence of an inadequate alleviation of the sewers is that HOFOR has to take further (very costly) action in the future (Hede, pers. comm). The third way is to choose a solution which requires as little space as possible. The two previously proposed solutions are both viable and possible within the frames of the project, despite the adsorption filter solution being more expensive. The reason being that the increased cost of the solution is offset by avoiding the cost of relocating the district heating pipes (Hede, pers. comm.). There is, however, a third proposed solution - purification wells (*rensebrønde*) (see Figure 31).

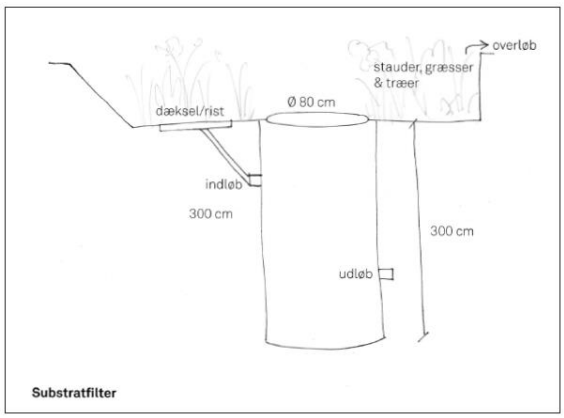

Figure 31. Illustration of a purification well, which is deep but does not have a big horizontal surface (BOGL and Orbicon, 2019)

The purification well solution is an expensive solution, but it also reduces costs otherwise needed for building up the layers and relocating wires and pipes in the other solutions proposed. This is due to its' limited horizontal spatial extent as seen in Figure 31. The purification well solution seizes minimal space and, furthermore, offer HOFOR the requested flexibility as it easy to install additional

purification wells (Toke, pers. comm.). The problem is though, that it cannot be financed through the co-finance project as it is, as a subsurface construction which the municipality neither is allowed to or has the competence to maintain (Hede, pers. comm.).

As a conclusive remark, Hede (pers. comm.) states that the consultants are subject to and bound by the frames which the municipality and HOFOR enforce, but which they continuously challenge to be able to create the 'good' solution. Conclusively, although the above example does not entail an end result, it gives a clear indication of the navigational practice necessary for managing institutional complexity through practitioners' everyday activities. Table 7 below is a summary of the different perspectives.

Table 7 depicts how various institutional logics are enacted through different organizations as well as constructed contradictions (own table).

Actor	**Ambition**	**Argument**	**Logic**	**Contradictions and synergies**
CKT and HOFOR	Decouple as much everyday rain as possible	To alleviate the sewers and strengthen the business case	Water Management and Financial	Seizure of space Co-finance barrier
Water and EIA	High purification capacity	To reduce pollution of the recipient	Water Management	Seizure of space Co-finance barrier
CKT and HOFOR	Minimize spatial extent of retention and purification basins	To avoid costly relocations of district heating pipes	Financial	Delimits available space for retention and purification basins Reinforces urban space logic
Road Authority	Room for a fire escape road	Accessibility for fire rescuing	Urban Space	Initially perceived contradiction, subsequently turned to an opportunity
Copenhagen Municipality and BOGL	A desirable green urban space	Urban use and design imperatives	Urban Space	Delimits available space for retention and purification basins

6.3 How the Hydraulically founded Requirements dictate the Design of the 'Good' Solution

Another example illustrating how the practitioners navigate the institutional complexities in the Strandboulevarden project, is through the naming of a physical infrastructure as hydraulically founded rather than emphasizing the urban design aspects, as was shortly mentioned in Chapter 5. The example will be delved into in order to highlight how practitioners with different institutional logics navigate within this complex organizational field. More specifically, the consequences of the 100 percent co-finance requirements, which implies that everything in the project must have a technical, i.e. have a hydraulic function, will become visible in this example.

6.3.1 The Importance of understanding Co-existing Logics

Firstly, the frames around the example will be set to facilitate the exemplification of how practitioners navigate between co-existing logics. BOGL, the landscape architect firm responsible for ensuring the incorporation of spatial elements in the project, got to know the premises, i.e. being no urban space funds, through the Procurement materials in the Program (CKT, 2018). Yet, when some of the younger landscape architects from BOGL - arguably coming from a more 'traditional' landscape architecture logic - presented some initial propositions and drawings, Schmidt, as project manager from BOGL, had to explain that the premises are different in the Strandboulevarden project, since everything needs to be 'hydraulically founded', as mentioned in Chapter 4 (Schmidt, pers. comm.). Indeed, the urban space logic that the practitioners from BOGL operate within, implies a predefined way of proceeding. A cloudburst project, such as Strandboulevarden, however, requires practitioners to understand or at least acknowledge the existence and pre-conditions set by other institutional logics at play - such as the water logic. "*It is only once we start actually drawing that the regulatory frames truly shine through, especially in a project like this one, where the hydraulic aspects and HOFOR are such important players*" (Schmidt, pers. comm.). Schmidt (pers. comm.) explains how the frames of the project only truly became apparent through the pre-analysis phase of the project, such as the specific spatial requirements and implications of the retention and purification basins, as mentioned in the above example of the battle for space.

The Strandboulevarden project clearly exemplifies how there are various institutional logics at play and how they have to co-exist. As Hede comments, "*we speak so many languages and have so many different intentions or focus areas in the project*" (Hede, pers. comm.). In effect, each practitioner has their focus area:

> *"It must be something traffic-functional; it must be something aesthetic/architectural and urban space related; we have some construction technology, that is, things must actually be possible; we need to have some water management; we simply have a problem we have to solve. This means that there are a lot of agendas to be prioritized. And no one can go in and say that this is more important than anything else because it is all important."*
>
> (Hede, pers. comm.)

As such, although planning in the public space has its own set of conditions - which also apply to co-finance projects, these conditions can also represent opportunities to shape and frame the design

beyond the purview of the water logic (Torgard, pers. comm.). However, these opportunities require stepping outside the purview of using a singular logic. As Torgard (pers. comm.) argues, changes or acceptance of other logics and principles mainly occurs when a practitioner becomes involved in a concrete case, which the example presented below highlights. Similarly, Hede (pers. comm.) uses a language metaphor to demonstrate how one can become accustomed to different institutional logics.

> *"If you speak German, then you understand German, but if you haven't been exposed to French it is hard to understand French. If you constantly hang out with someone who speaks French, then you learn to understand the language, or at least you start understanding that it is another language."*
> (Hede, pers. comm.)

In effect, by being exposed and constrained by the premises set by the prevailing water logic, the practitioners abiding to the urban space logic have to learn to navigate past the institutional complexity which presupposes a collision and contradiction between the logics. As Schmidt states: *"as landscape architects we do not need to understand it* [water management] *all intrinsically, but we need to understand it to a degree that enable us to navigate within it"* (Schmidt, pers. comm.). In effect, Schmidt seems to acknowledge that the professional logic on which she bases her everyday practices is not sufficient when faced with the institutional complexity in Strandboulevarden. In effect, the urban space aspects have to adhere to the constraints in the Strandboulevarden project. As Torgard from CKT explains:

> "*I have known the premises from the beginning, and I actually think that the premises are extremely interesting.* [...] *So how to "curl" the architect's brain around to think about it in another way. I am curious to see how it will be and whether they can actually carry it through. How it will end up. I'm very curious to see that"*
> (Torgard, pers. comm.)

Torgard (pers. comm.) sees the possibilities and challenges about having to think radically different as a compelling opportunity for the City, and is intrigued to see how the project evolves, suggesting a proactive approach to the challenge at hand since the urban space aspects are being squeezed in the Strandboulevarden project due to the missing urban space funds. To 'curl the architect's brain around' certainly implies a significant change in the ways of understanding and thinking, which encompasses different logics and hence involves getting a deeper understanding of the various dynamics at play. This is, however, not an easy task, as will be demonstrated below.

6.3.2 A Hydraulically founded Design Element

In the designated water purification and retention areas on Strandboulevarden, the plan is to protect the retention basins from erosion at the in- and outlets (CKT, 2018). This can be done in two ways: either by having a gradient of 2:1 (for every meter down, the edges of the basins go out 2 meters); or by having a 'hard' border, i.e. a basin edge of cement. While option one leaves room for more fauna, it also requires more space which - as mentioned in the battle for space example above - is not desirable here. Accordingly, when BOGL presented their initial 'design potentials' drawings to the project group (BOGL and Orbicon, 2019), the drawing depicted the water retention basins with the basin edges a little wider than necessary and named "*siddekant",* meaning 'sitting edge' or area, rather

than basin edge (see Figure 32). As Torgard (pers. comm.) argues, this illustrates how the urban space logics shines through, with BOGL emphasizing the recreational aspects to the project. Indeed, BOGL were applying their urban space logic, whereby design potentials were taken advantage of, designing the basin edges as multi-functional, serving both a hydraulic and urban space function.

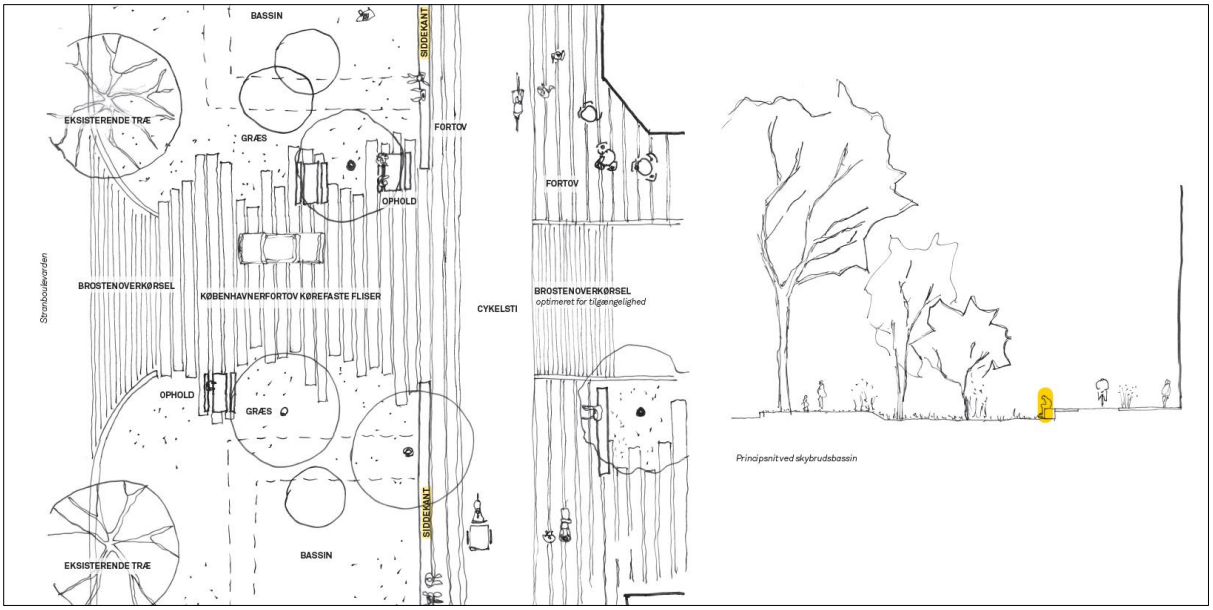

Figure 32. The design potentials presented in the pre-analysis report BOGL and Orbicon (BOGL and Orbicon, 2019 p. 49).

Figure 32 shows the design potentials presented in the pre-analysis report from BOGL and Orbicon. The drawing shows in yellow how the basin edge is called 'siddekant', i.e. sitting edge. Furthermore, the drawing on the right shows an illustration of a person sitting on the edge, suggesting alternative use of a water management infrastructural element (BOGL and Orbicon, 2019, p. 49).

However, by emphasizing the spatial qualities by calling it a sitting area, the urban space logic is in direct confrontation with the water logic. In fact, "*them* [BOGL] *calling it a recreative urban space automatically raised an alarm for the practitioners from HOFOR"* (Torgard, pers. comm.). Since the project needs to be approved by the Utility Secretariat, the practitioners within the water logic are extremely wary about everything in the project being hydraulically founded. A 'sitting area' however, does not imply a hydraulic function. Nevertheless, as Strandboulevarden is not a 'business as usual' project, no one truly knows the extent to which the requirements set by the Utility Secretariat can be bent or not (Schmidt, pers. comm.). Hence, the urban space occupational community has been given cues by the practitioners working on the basis of a water logic about how the design presented (Figure 32; BOGL and Orbicon, 2019) still fulfills a hydraulic function as such, since it is a basin edge; however, calling it a sitting area will potentially cause trouble and ought to be avoided (Torgard, pers. comm; Hede, pers. comm.).

This example illustrates how the framing and even 'naming' of a certain design element can have consequential influence on the development of the project.

"*It is extremely important how we say things. This means that when they come and draw something, in this case a sitting edge, well then that's not what it is. It is a cement edge which has a hydraulic*

function. The fact that it coincidentally is 50 cm high and thus functions perfectly as an area to sit on, that's something completely different."

(Torgard, pers. comm.)

In fact, although in principle, the procedures and design remain the same - whereby an urban space is created, supportive of urban life and play, these are not the elements to emphasize in this project (Torgard, pers. comm.). Schmidt (pers. comm.) admits, that BOGL has not yet reached the level of understanding necessary in order to fully understand the water logic and to be able to act thereupon. Nevertheless, interviewees from CKT, Orbicon and BOGL seem to agree that there is a good collaborative spirit amongst them, with everyone striving to find the best possible solution. As such, since the project has to be open for scrutiny from the Utility Secretariat, the focus must be on the hydraulic and hence financial aspects at all times.

The sitting area versus basin edge problematization is a good example of how this new type of climate adaptation projects require a much deeper insight into co-existing logics' values, beliefs, and ways of working. Furthermore, it illustrates how these logics are socially constructed, not necessarily competing and that these beliefs and values can be deconstructed. Torgard (pers. comm.) explains that there are numerous things and will be numerous things until the project is completed, that they are not aware of, or which have not been dealt with in other projects before. The fact that everything is scrutinized to the extent it is in the Strandboulevarden project, suggests the need for new courses of action from all actors involved.

6.4 Analytical Summary

A short recapitulation of the main points derived from the three analytical chapters is hereby presented to set the scene for the Discussion (Chapter 7).

As the theoretical chapter depicted (Chapter 2), practitioners' actions are implicated by the organizational field in which they are embedded and its inherent institutional logics. The organizational field of cloudburst management in Copenhagen consist of a multiplicity of organizations and practitioners which each adhere to, and enact, various institutional logics. Some of the most influential organizations and actors are the Center for Climate Adaptation (CKT), which is the municipal organization tasked with executing the Cloudburst Management Plan; the utility company HOFOR, which is responsible for funding and securing the hydraulic aspects of the resolution; and the politicians who, amongst others, exert the power to grant urban space funds to specific projects (Chapter 4). These organizations are interwoven into, and affected by, a set of cultural artifacts which dictate a co-dependency relation and, further, enable the spectrum of legitimate repertoires. In the case of Strandboulevarden, main artifacts include: the Co-finance Note - which because of the lack of urban space funds, constitutes the economic purview of the project - the Cloudburst Management Plan; and the Climate and Investment Statement, which dictate the overall framing of the issue and its resolution (Chapter 4). These cultural artifacts shape organization's and practitioners' actions by providing 'the rules of the game' through a set of objectives, ambitions as well as means for their fulfillment (Thornton et al., 2017). The rules of the game are further produced and reproduced by practitioners from different occupational communities who actively translate and communicate corporate norms and beliefs into institutions, terms and institutional logics that reflect their own culture and interests (Hoffman, 2001; Thornton and Ocasio, 2008).

In Strandboulevarden, the occupational communities of project management - focusing on deliveries, deadlines and objectives; water management - concerned with the technical and hydraulic aspects; and lastly, urban space - who emphasize the functionality and aesthetics of the solution, were particularly prominent and influential in defining the 'good' solution (Chapter 5). In conjunction, the occupational communities and cultural artifacts shape action according to various co-existing institutional logics who fight over issue interpretation (Chapter 2). In the case of Strandboulevarden, the institutional logics of water management, finance and urban space are the main influencers on the course of action (Chapter 5 and 6). Notably, the institutional logics of urban space and water management collide in certain situations generating an institutional complexity, especially due to the assertiveness of the financial logic which dictates every aspect of the solution to be hydraulically founded (Chapter 4.3.3). However, according to PDI the institutional complexity is a social construct which in the case of Strandboulevarden proves to be rigid regarding certain aspects (such as the financial ramifications), and in others is deconstructable or at least malleable to a degree that lowers the friction between logics (as illustrated by the fire escape road example in Chapter 6.2).

Examples such as the fire escape road demonstrate how logics are constructed as being compatible or conflicting through practitioners' practices (Smets et al., 2017). This is a central point for the quest of achieving the 'good' solution and emphasizes the role of practitioners. Thornton and Ocasio (2008) argue that individuals not only belong to one logic, but in specific contexts they may actively import and export elements of institutional logics across institutional orders. This research suggests that practitioners have the potential to do the very same within a single institutional order, namely the professional order. In Chapter 5 and 6, examples of such more or less deliberate maneuvers were investigated.

Conclusively, based on the results from the three analyses, a discussion of how practitioners can deliberately use these maneuvers, as navigational 'tactics' in the development of the good solution will be presented in Chapter 7.

7. Discussion

The previous analytical chapters (Chapter 4, 5 and 6) presented the analyses where the organizational field of Cloudburst Management in Copenhagen, its inherent occupational communities and institutional logics were unraveled. Certainly, the institutional logics of water management, urban space and finances all have an influence on the practitioners from CKT, BOGL, Orbicon and HOFOR in the development of a 'good' solution for Strandboulevarden. Through the analyses it has become apparent how several tactics and activities are deployed by practitioners to navigate between the co-existing institutional logics. Through their everyday activities, practitioners seek to navigate the socially constructed institutional complexities, which occur when the logics of water management, urban space, and finances are perceived as being contradictory. An example being the designing of the basin edge (Chapter 6.3).

This thesis seeks to examine what can be transferred to future projects that share similar institutional constraints as Strandboulevarden. Accordingly, this chapter will discuss the main findings unraveled through the analyses, answering the last sub-research question: *"What can practitioners learn from the case of Strandboulevarden and use in future projects with similar financial conditions?"*

The discussion is divided into the following sub-sections:

1. Given the research question of this thesis, a discussion of how the 'good' solution is defined will set the frame.
2. The tactics used by practitioners to achieve the 'good' solution are examined, divided into *tactics for framing the project* and *the need for hybrid practitioners*.
3. An outlook is made on the influence of changes in practices and other institutional changes.
4. Lastly, reflections of, and a discussion about, whether 'minimum projects' should be executed in the future, concludes this chapter.

7.1 How is the 'Good' Solution defined in Strandboulevarden?

As has become apparent throughout the analysis chapters (Chapters 4, 5, and 6), there are different interpretations and definitions of the 'good' solution depending on which institutional logic(s) a given practitioner adheres to and which organization they are a part of. In the following, the different definitions of the 'good' solution will be discussed, demonstrating that this is a highly contentious issue requiring to consider the beliefs and values of various occupational communities at once. In effect, with the Strandboulevarden project being a cloudburst management project, it seems natural that there is a focus on water handling, as reflected by the occupational community of water management (Chapter 5.1.2). Similarly, since Strandboulevarden represents a public space in the neighborhood of Østerbro, the urban space logic certainly seems appropriate to emphasize, as reflected by the initiatives taken by practitioners within the urban space occupational community (Chapter 5.1.3).

Cloudburst management de facto pre-defines the technical solutions as essential

As specified in the Introduction (Chapter 1), within the institutional setup and, in particular, the Cloudburst Management Plan, the problem of securing Copenhagen against floods and its solutions

are already technically pre-defined, establishing a problem-solving agenda through clearly defining an infrastructural, i.e. 'technical' lack and a structure for its resolution. Consequently, large amounts of resources are allocated to this resolution, whereby it can be argued that the spatial aspects become undermined. In fact, Steffensen (2014) already reflected upon this before this new type of projects emerged, arguing that there seems to be a risk in Copenhagen Municipality of overemphasizing the hydraulic aspects in cloudburst management projects to an extent which overshadows a focus on green and recreational contributions to the city. In the Strandboulevarden project, Steffensen's concerns have arguably become materialized through the political re-prioritizations and the influence of the Co-finance Agreement that specifies that everything implemented must be hydraulically founded (Chapter 4).

Given the financial ultimatum, one could believe that the prevailing logic of water management decides what the 'good' solution is; namely a technical solution which secures the city against floods. Yet, a thorough analysis of the Strandboulevarden project (Chapter 4, 5 and 6) has highlighted how the logics are not necessarily only competing. In effect, certain framing parameters - such as the Architecture Policy - and practitioners' ability to use different tactics to import or export elements of other logics have proven to be essential in order for an urban space focus to remain.

Co-existing logics implies a nuanced definition of the 'good' solution

Finding *the* 'good' solution is certainly a highly simplified statement. As has been argued for throughout this report, Strandboulevarden is a profoundly complex project, where practitioners do not necessarily adhere to one logic only, but are able to navigate the intricacy of the situation. Hence, the definition of the 'good' solution is more blurred and more complex to define. In effect, as has become apparent through the 'battle for space' and the sitting area vs. basin edge examples (Chapter 6), the institutional logics of water and urban space co-exist in this project in a way which leaves room for both logics to flourish to the extent possible, given the financial constraints. As the hydraulic modeler from Orbicon states:

> *"It is in the interest of everyone that we make a project which makes sense and which the people who live in the area can also use for something. It's not okay if we just make a technical solution which is super ugly. But it is difficult to make something proper when you're not allowed to spend urban space funds to make the last finish. That is a challenge. An interesting challenge."*
>
> (Toke, pers. comm.)

By recognizing a need to consider the urban space aspects in the project, this practitioner, adhering to a water logic, reflects the need for holistic thinking. The above quote, furthermore, highlights the importance of incorporating the wishes of local citizens.

Incorporating the voices of the 'few' as well as the 'majority'

De facto, the first initiatives taken for changing Strandboulevarden came from local citizens in the early 2000s, - long before CKT and the Cloudburst Management Plan came into existence (Hansen, pers. comm.). As mentioned in Chapter 4.2, the Local Committee Østerbro developed seven prioritizations for Strandboulevarden, including active citizen engagement, handling of parking spots and a wish to have green areas on the 'sunny side' of the boulevard (Laursen, pers. comm.). These prioritizations, as well as further inputs from local citizens, guided the development of the Program (Hansen, pers. comm.). Yet, the co-financing framework halted this process, cutting the funds

available for a further citizen engagement - which the municipality usually does in similar projects (Hansen, pers. comm.; Bjørneboe, pers. comm.). Gunder (2005) underlines that a desire to solve a pre-defined problem and/or to solve it through a pre-shaped resolution might not necessarily reflect the desire of 'the others', but merely the privileged minorities. Accordingly, the extent to which the given solution on Strandboulevarden actually reflects the desires of the 'others' - such as the local citizens in the area - is questionable. Yet, it is questionable both if the water management logic 'wins' and if the 'urban space' logic - as defined by the consultants and CKT 'wins'. Gunder (2005), furthermore, states that a way in which the privileged minorities exert control is by framing the process with a problem-solving agenda through technically defining the problem and its resolution. By the deployment of rhetorical tropes - claims of value neutrality, rationality, science and expertise serve as a means of validation to legitimize the endeavor (ibid.). Indeed, despite the lack of funds, the first project team and the Local Committee of Østerbro joined forces (with funds from the Local Committee) and invited the local community to an orientation meeting when the project was officially launched in the fall of 2018 (Torgard, pers. comm; Ørsnes, pers. comm.). As such, the municipality still to a certain extent performed their democratic duty of informing and engaging the inhabitants of the area. Nevertheless, BOGL, being a landscape architecture firm known for their close collaboration with local communities (BOGL, n.d.), have uttered their wondering about the missing funds available for ensuring a project which meets the wishes and needs of the people living in the area (Schmidt, pers. comm.). Uplifting however, Laursen (pers. comm.) from the Local Committee of Østerbro, explained that he is not worried that the urban space will become worse, despite the strict framework of the project. This statement opens up another point of discussion, how and who defines whether the urban space of Strandboulevarden is degraded or improved when climate adapting an area without urban space funds available.

Improvement or degradation of the urban space

Although the Co-finance Notice states that everything must be hydraulically founded (BEK nr 159, 2016) (see Chapter 4.3.3), it also asserts that the urban area on Strandboulevarden cannot be degraded. Yet, as Torgard comments:

> *"If you introduce a new functionality that makes the urban space markedly different, then the definition of whether it is a degradation or an improvement, becomes an important question that calls for interdisciplinary dialogue."*
>
> (Torgard, pers. comm.)

As such, the question of how the notion of 'degradation' and 'improvement' are defined becomes interesting. As an example, the urban space on Tåsinge Square, mentioned in the Introduction (Chapter 1), has clearly changed characteristics from being a huge paved area in the form of road and parking spaces to becoming an internationally renowned green infrastructure based urban redevelopment project - highlighting how 'more value' can be created when climate adapting in cities. In Strandboulevarden however, the situation is different. As was elaborated upon in Chapter 4.3.3, since everything needs to be hydraulically founded and the fact that no utility funds are to formally be spent on urban improvements, questions such as whether replacing an already broken tile contributes to an improved or to a non-degraded urban space become complicated. Indeed, "*if you pick up a tile and it is broken, formally you can't put down a broken tile, you have to replace it. And then again the*

question is whether utility funds should pay for tiles?" (Hede, pers. comm.). As Hede (pers. comm.) sees it, there are two problematizations:

> "*We have an overall problematization which is that there is doubt about how we use the funds and whether we can finance pure co-finance projects with solely utility funds. And then there is the question about creative expression; what can we actually do with these utility funds?"*
> (Hede, pers. comm.)

The 'pilot' project characteristics of Strandboulevarden truly shines through, with numerous unanswered questions which no one seems to have answers to. As a further example, Hede (pers. comm.) argues that by cutting down a row of trees a sum of money becomes available to replant the trees, which is of course an advantage. Yet, as Hede argues, "*if they had urban space funds, they would have been able to plant even more or make even nicer pavements"* (Hede, pers. comm.). In the Strandboulevarden project, they simply cannot justify a 'nice' pavement from a hydraulic point of view. In effect, the solution on Strandboulevarden will surely not reach the same potential as other projects where urban space funds have been allocated, such as Tåsinge Square (mentioned in Chapter 1.2) where they have established nice surfaces and a lot of trees (Hede, pers. comm.).

Nonetheless, the Co-finance Notice states that if anything is destroyed, it can be replaced (BEK nr 159, 2016). In that sense, "*one could say that if the entrepreneur accidentally dropped every tile, it could be justified that they could be replaced by utility funds*" (Hede, pers. comm.). This brings into question the extent to which it is fair that the utility company pays for something that actually should be paid for with urban space funds (Hede, pers. comm.). Schmidt (pers. comm.) expresses the same concern; *"such things as tiles, pavements, and broken tiles. In principle we should just put them down again. Is that what we do or what?"* (Schmidt, pers. comm.). Indeed, as Hede concludes, "*what if the tile is already broken? How broken can it be before having to replace it? Well, we actually don't know* [what to do] *at this moment"* (Hede, pers. comm.). This shows just how complicated this project is and emphasizes the necessity for developing tactics to navigate this type of project in the future.

Conclusively, although the focus is on different aspects of the project depending on which logics practitioners abide to, there seems to be an overall consensus that the 'good' solution entails a holistic approach whereby tactics are deployed which allow for as many wishes, priorities, considerations as well as necessary compromises to be taken into consideration.

7.2 Navigating towards the 'Good' Solution

Different tactics and activities have been identified through the analyses of the thesis. These tactics have been utilized by practitioners in order to push the project in different directions in accordance with the above-mentioned perceptions of the 'good' solution. Several forms of tactics have become apparent, namely organizational, institutional and procedural. These tactics are of various relevance for different occupational communities, organizations and phases of a project. Notably, the deployment of tactics indicates a motive; a deliberate set of maneuvers which seek to influence the course of action. These different tactics are presented below, divided into two main sub-categories, namely *tactics for developing the frames of the project,* and *the need for hybrid practitioners.*

7.2.1 Tactics for developing the frames of the project

One of the things that have changed through the long process of developing the project on Strandboulevarden are the frames, both technical and financial. As described in Chapter 4, the frames for developing the project went from assuming an allocation of urban space funds, to the fact that the project has to be developed solely with utility funds. During the current process - spanning from the creation of the Program in 2018 till now - the frames have certainly changed.

An extra phase bringing forth the 'good' solution

A central aspect in framing the course of action is the procurement materials, which are developed by CKT to frames the consultants' task. These documents have the potential to convey a better understanding of the problem at hand and the route towards the 'good' solution. They serve both as a basis for evaluating the offers from the competing consultancy teams, and as a point of reference for the following endeavor, once the consultants have been appointed - as will be discussed shortly (Torgard, pers. comm.). However, they cannot stand alone as many of the frames only truly become apparent in the concrete. As Bjørneboe states: *"it often turns out that you need a phase to get the Framework in place, it is not an easy read* [the procurement material] *and that is because we have to get down into the specifics"* (Bjørneboe, pers. comm.). Hence, even though frames are given through the procurement material, the real complexity first occurs when digging into the specifics. Indeed, frames can change throughout the development of a project, implying a fluidity which is difficult to predict for. Consequently, it seems of paramount importance to ensure that the practitioners involved in this type of projects are able to navigate these kinds of changing parameters and the thereby related challenges.

It was discovered that major conditions were not taken into consideration in the previously approved Sketch Proposal (2017), such as the need for a fire scape road and the purification of roof water. Being problematic aspects to neglect - and because of the novelty of conducting this kind of projects in general - it was decided to grant the new consultants (BOGL and Orbicon) an extra phase, i.e. time for conducting a new pre-analysis (Bjørneboe, pers. comm.; Hede, pers. comm.). With tight development funds available, it was not a straightforward decision for the project manager from CKT to approve this extra phase and the pre-analysis related costs (Bjørneboe, pers. comm.; Torgard, pers. comm.). Yet, it turned out to be a great investment, not only because of these essential aspects that had previously been neglected. As shown in Chapter 6, when exemplifying the shift between an east and west placement of the solution, the hydraulic models made by Orbicon actually showed the possibility for placing the solutions on the eastern side, i.e. the preferred 'sunny' side as seen from an urban space logic. As mentioned, the pre-analysis actually turned out to also favor an eastern placement from a hydraulic perspective. Accordingly, it can be argued that the implementation of an extra phase for pre-analysis uncovered new possibilities. In this case, the possibility of getting the urban space aspects placed on the 'sunny' eastern side. One can therefore say that the logics of water management and urban space 'came together' as a result of this new phase.

Even more importantly, conducting the pre-analysis allowed the framework to be more clearly understood by providing the foundation for drawing things in and discuss their implications across occupational communities (Schmidt, pers. comm.; Torgard, pers. comm.). Hence, this enabled things to be cleared out and, moreover, made room for innovation and challenging of institutional frames. An example thereof being the case with the purification solutions and purification demands. In fact,

Orbicon proposed the use of purification wells as the technical solution used on Strandboulevarden. Toke (pers. comm.) explains how this solution is actually more flexible and requires a smaller area for water purification than the proposed retention basins (see Chapters 5.1.2 and 6.2). This solution indeed seems favorable, since it would mean that more room becomes available for recreational or other urban space values. Unfortunately, however, as mentioned in Chapter 6.2, because the purification wells are a subsurface construction, they cannot be financed through the Co-finance Agreement (targeted at surface solutions) suggesting that the municipality is neither allowed to nor has the competence to maintain them. Clearly, there seem to be regulative frames which ought to be reconsidered, yet this is not within the scope of this study. Nonetheless, the example highlights how the water management focused practitioners are attempting to apply tactics which take a holistic approach, incorporating the urban space logic as best as they can.

Conclusively, it would seem that this extra project phase, within the disposition proposal phase (see Chapter 4.4), has proved to be valuable. Considering the complexities and rigid frames that this, solely utility funded, project has it seems as if there is a necessity for time to be creative and innovative in order to deal with the challenge of creating a solution that gives value to both the technical solution and the urban space. This seems relevant not only for pilot-projects, but all similar projects where creative thinking is necessary. In fact, when asked about what the development of the 'good' solution requires, Hede's (pers. comm.) answer is time and dialogue. Nonetheless, one could argue that the necessity of this could potentially gradually decrease as the practitioners get more and more familiar with these kinds of projects. At least, in the Strandboulevarden case, it seems that the allocation of extra time to ensure clarity around the frames when new complexities arose, was of great use.

Practitioners that are able to Navigate the Complexities at Hand

Related to having well established frames with well-prepared procurement materials, choosing the 'right' consultants to carry out the development of the project seems central as well. In the case of Strandboulevarden, the project group chose to use the Framework Agreement for Parks and Urban Spaces for selecting the consultancy team to develop the project. The Framework Agreement entails three consultancy teams that consist of a landscape architect as main consultant and an engineer as sub-consultant and allows for a limited procurement process (Chapter 4). This meant that CKT knew the consultant firms and the practitioners within them. Furthermore, using the Framework Agreement saved a lot of time, time which otherwise would be required for an EU-procurement and for the consultants to pre-qualify themselves for the task (Bjørneboe, pers. comm.). The time saved could thus, mean more time could be used for developing the project and its frames, as suggested with the extra developing phase mentioned above. This is certainly not to be the only advantage. In effect, once a consultancy team becomes part of the Framework Agreement, this indicates that they are familiar with the Co-Finance Notice and most of them will also have made cloudburst management projects before (Hede, pers. comm.).

Albeit it might seem obvious, emphasis must be placed on the importance of experience with and knowledge about working with these matters. Knowledge and experience, which mainly can be gained through active involvement and work in similar projects (Schmidt, pers. comm.; Torgard, pers. comm.). As Schmidt (pers. comm.) comment, these kinds of projects are new for the practitioners at BOGL and they have to learn how to do them. Reflecting on this, one might say that future similar projects would benefit from utilizing a Framework Agreement with consultants that have experience with these challenges. In the project of Strandboulevarden, BOGL is learning about the hydraulics,

especially due to their close collaboration with Orbicon (Schmidt, pers. comm.). Considering the financial frames of the project, architects that are able to navigate the hydraulic frames and use them to their advantage seem preferable. However, this might limit the degree of innovation and possibility for other consultants to contribute to the creation of a 'good' project. The same could be said about the engineers, being able to understand the urban development agenda and recognizing that cloudburst management is more than "merely" protection against floods. As Toke (pers comm.) puts it: "*We are just the engineers, we don't really care, we just need to get space for our water, and if there is space for that, we are satisfied […] but therefore one still wants to make a project, which gives value to others than just HOFOR.*" (Toke, pers. comm.). In effect, even though the goal for engineers is first and foremost to handle the water, they still acknowledge that this project should be able to do something more than that.

Conclusively, the discussion above has highlighted some of the tactics used for developing the frames. An extra phase for conducting a pre-analysis and getting the framework in place has indeed served as a possibility for uncovering possibilities for the urban space, such as the possibility to place the solution in the east side. Furthermore, the Framework Agreement enabled the municipality to hire a consultancy team with the relevant knowledge and experience.

7.2.2 The Need for Hybrid Practitioners to Navigate the Institutional Complexities

Institutional complexities occur when different logics are perceived as contradictory, resulting in frictions. As has been emphasized throughout this report, the largest perceived friction between the water management and urban space logics is a result of the lack of urban space funds. In fact, while the collaboration with the engineers and the municipality and the requirement imposed by the hydraulics can be quite problematic issues in 'normal' projects, the main challenge is the lack of urban space funds (Schmidt, pers. comm.). This research has certainly shed light on instances where the hydraulics demands impede the urban space functionality (as the 'battle for space' example depicts in Chapter 6.2).

Nevertheless, the analyses have also shown how practitioners from the different occupational communities have deployed several tactics in order to navigate this complexity, despite the rigid frames, trying to find solutions which accommodate all aspects. In effect, the Cloudburst Management Plan for Copenhagen states that cloudburst management should be a combination of surface solutions and sub-surface pipes and that synergies for urban space development must be sought for (København, 2012). As also explained in the Program, the area on Strandboulevarden has great potential for the creation of a greater green urban space (CKT, 2018). This argues for a necessity for collaboration between the inherent logics in the project, namely water management and urban space. This is necessary if future projects with similar financial constraints should contribute to a positive urban development while securing the city against floods. As such, the tactics deployed by practitioners should be aimed at a sustainable hybridity between the logics through practitioners' everyday practices and activities. The focus is thus to reduce the potential friction between the logics and to find mutually reinforcing elements in the quest towards the 'good' solution.

Conclusively, despite the financial restrictions which result in a project imposed by a strong hydraulic logic, the project is also subject to the conditions of planning in the public space. Thus, there

are conditions which represent opportunities to shape and frame the design beyond the purview of the water logic. To do this however, there is a need to actively integrate these conditions and translate their implications so they can represent an opportunity, as seen, for instance, with the sitting area vs. basin edge example (Chapter 6.3).

Rhetorical Tropes for Enacting Logics

As described in Chapter 5.1.2 and 5.1.3, the occupational communities of water management and urban space have the role of imposing and translating the respective institutional logics through cultural frames and actions. In Chapter 5.1.3, examples of how the urban space logic is integrated into the Program are elaborated. In effect, the practitioners from the urban space occupational community have integrated rhetorical tropes with justifications from various cultural artifacts that dictate the requirements and ambitions for planning in the public space, for instance via the Architecture Policy and Urban Nature Strategy (Chapter 5.1.3). The integration and highlighting of these conditions and ambitions into the procurement material certainly helped CKT frame the task for the consultants by emphasizing that, even though the solution must be hydraulically founded, it must still be integrated into an existing urban space. As one of the architects from CKT who developed the Program explains:

> *"I am glad that we have this document* [the Program] *to refer to. The first time, they* [the consultants] *read it from their viewpoint, but now, they've been working with it and they've heard our response to what they've presented. It is a learning process to make this type of projects."*
>
> (Torgard, pers. comm.)

Arguably, dialogue and a common understanding seem essential in order to achieve the 'good' solution. In effect, "*dialogue may be seen as transformative in relation to the creative actions of individuals through collective communication, the sharing of thoughts and knowledge of individuals as the generative materials to transform existing beliefs as well as create new innovations and cultural artifacts*" (Banathy and Jenlink, 2005). Surely, dialogue becomes even more central in a project such as Strandboulevarden, where practitioners with distinct professional backgrounds are to reach common ground.

Tactics for Bridging between Logics

As explained in Chapter 4.4, CKT consist of several professional backgrounds, i.e. practitioners from different occupational communities. CKT as an organization itself thus serves as a platform for the dialogue between these different occupational communities. Within the project of Strandboulevarden, one of the most influential factors on a successful navigation and translation found through this research is the presence and integration of practitioners from various occupational communities, such as the organizational construct of CKT. As practitioners mainly adhere to certain institutional logic, for instance water management or urban space, they seek to shape action according to the values, ambitions and beliefs of that logic. Therefore, the absence of 'champions' of an institutional logic might lead to the negligence of those values. Steffensen (pers., comm.) argues that the bringing together of staff from different teams within the municipality into the new Center for Climate Adaptation (CKT) has strengthened the unification, reducing the risk of certain logics suppressing others. He especially contributes the physical proximity to employees that adhere to diverting logics and their increased integration into each project as central aspects of this matter (ibid.). Similarly, Schmidt (pers. comm.) describes how different practitioners within the project group

each have their cause to fight for and that some of them have been particularly helpful in providing clues and generally being a co-player.

This is not just the case with practitioners from the same occupational community but, maybe counterintuitively, also with a practitioner from other occupational communities (Schmidt, pers. comm.). Hede (pers. comm.) describes his role in the project as a mediator and translator of the water related aspects. His function being both to assist with and impose water management logics on the consultants and to advise the project group in water related matters (Chapter 5). Thus, the presence and participation of practitioners from different occupational communities serve the function of ensuring the integration of certain values and ambitions and simultaneously to help translate the inherent demands to other practitioners.

Platforms for dialogue and translation

A platform that can facilitate such a dialogue and translation between the different occupational communities is arguably the Project Group meetings. These meetings have gathered practitioners representing essential actors, organizations and occupational communities (Project Group meetings, 2019). The presence of 'champions' from the various institutional logics has not only ensured the logics' incorporation and consideration, but also enabled a dialogue and translation across 'languages'. Furthermore, the participation of practitioners with an understanding and respect of not only the institutional logic which they adhere to, but also other logics, certainly seems to increase the degree of innovation and lower the friction between logics. These findings, however, do not only apply to the Project Group meetings. Toke (pers. comm.) describes how BOGL and Orbicon have regular work meetings, both formal and informal, where the engineers can talk with the architects about a given issue. This enables both a translation and a platform for innovation. The meetings do, however, not suffice by themselves.

Examples of other types of platforms encountered in the project of Strandboulevarden takes a more material form. As described in relation to the pre-analysis, there is a need to draw things in order to facilitate a translation. As example being the design drawings presented in Chapter 6.3. Another visual way of translating ideas between the architectural and technical logics is by the use of 3D models. Toke (pers. comm.) argues, that the use of 3D models instead of 2D models would have saved a lot of time, avoided the need for interpretations and helped visualize other aspects. In effect, when a basin is drawn by the landscape architects in a 2D drawing with specified elevations, the engineers need to interpret on that in order to make the 3D models for the hydraulic calculations (Toke, pers. comm.). *"It gives us some extra work and it also implies interpretations, i.e. I have to interpret what they have thought here, and how it interrelates"* (Toke, pers. comm.). As Geraldi and Arlt (2015) confirm, visuals are influential and constitute an integral part of analyzing problems and making decisions. They can help managers to be sharper and quicker; mediate and influence the direction of negotiations; and - most centrally for this case - visuals encourage taking different perspectives on the multi-faceted problem at hand (Geraldi and Arlt, 2015). As such, it would seem that a direct translation of the landscape architectural logic's visions to the concrete technical solutions - which the engineers must design - would have been useful in this case and which the use of a 3D model could have facilitated. Unfortunately, however, due to the financial constraints, CKT has had to ask BOGL not to make 3D models, although these would have been useful for Orbicon (Project Group meeting, 2019). Once more, it becomes clear the extent to which the financial purview of this project represents a pertinent challenge which practitioners have to navigate.

7.2.3 Tactics to take Further

The above sub-sections have discussed the different tactics used in the Strandboulevarden project. Since it would seem that this pilot-project will not be the only of its kind, central takeaway points can be highlighted which can potentially serve in future projects with similar conditions.

Framing is essential, especially in a project with many unknowns. A central frame in this regard, is of organizational character, namely the integration of various occupational communities into the project group. The presence and participation of practitioners from different occupational communities serves the function of ensuring the integration of certain values and ambitions and simultaneously helps translate the inherent demands to other practitioners. Similarly, using a Framework Agreements not only saves time, but also allows for specifically selecting the kind of consultants assumed capable to complete the complex task. This certainly also becomes significant as experience with navigating institutional complexities can result in hybrid practitioners. That is, practitioners who strategically can import or export elements of other institutional logics to further their own agenda.

Practitioners can further seek to shape the subsequent action by integrating rhetorical tropes and demands into the procurement materials, which frames the consultants' task. In this regard, an extra phase for materializing these frames proved necessary and, furthermore, constitutes a possibility for uncovering unknown possibilities. Here, the importance of dialogue becomes apparent, both amongst all the project group members and between the consultants, serving as a bridge which enables translations between the different logics involved to occur. This implies the need for platforms to facilitate dialogue and translation, e.g. project group meetings, design drawings and 3D models. These takeaway points can be further accompanied with a discussion of the changes in practices which occur as a result of these new navigational tactics; as well as institutional changes more generally.

7.3 How the Experiences learned from Strandboulevarden can lead to Changes in Practices and Institutional Change

The above-mentioned tactics are mainly derived from activities and actions taken in the case of Strandboulevarden. One can therefore consider the extent of their reverberations, since they constitute the 'mundane' everyday practices and activities, seeking to manage the institutional complexity wherein emergence and continuous change is often located (Chapter 2 - Theory). The result of which can be changes in institutions and or practices. As Hede (pers. comm.) states, to work with these issues interdisciplinary requires continuous change, by taking one step at a time to approach an acceptance of the inherent complexity. It is likely that a change in practices will also occur as practitioners become more skillful navigators and thus, deploy novel tactics, as mentioned above. In the following, a reflection of how the everyday work with institutional complexity and overcoming barriers spurr changes in practices and changes in institutions are briefly discussed.

Instigating Changes in Practices

Changes in practices can amongst others come as a result of experiences from working with institutional complexities within projects. Experiences, which can contribute to practitioners 'practical understanding' and thus, guide their navigational practices in complex situations where logics collide (Chapter 2 - Theory). As an example, some of the practitioners involved in Strandboulevarden, have

previously been involved in another complex cloudburst project; the 'Karensminde Aksen' project. As commented on by Schmidt (pers. comm.), the experiences learned from this project have certainly had a positive effect on the ways in which the Strandboulevarden project is being conducted. In the Karensminde Aksen project, Orbicon worked closely with another landscape architecture firm and are therefore acquainted with to the collaborative processes needed in this kind of projects (ibid.). The Karensminde Aksen project, furthermore, had a pre-analysis phase, which helped to guide the one in the Strandboulevarden project (ibid.). These experiences have arguably influenced the practical understanding of the involved practitioners and probably the maneuvers they have taken, especially regarding the pre-analysis and the collaboration between the two consultancy firms. As Schmidt (pers. comm.) describes, in other projects BOGL has experienced that the engineers dictated the solutions, but Orbicon has been very open-minded and collaborative, which have arguably been central in jointly defining the 'good' solution.

Accordingly, it would seem that the practitioners involved in the Strandboulevarden project will similar to in the Karensminde Aksen project, build up their practical understanding from the encounters of collision through the process. The practical understanding of how to navigate within the strict financial and hydraulic purview will arguably be crucial for the ability of future projects with similar conditions to achieve a 'good' solution. One can hope that the interdisciplinary effort, which seeks to clarify what one can fund with utility funds, not only goes into the specifics, but also seeks to draw on the practical understandings by describing navigational tactics. Otherwise, there is a risk that solely singular practitioners are sufficiently equipped to navigate the institutional complexities.

One of such practical understandings emerges from the experiences with the budget proposals. As Hansen (pers. comm.) and Ørsnes (pers. comm.) suggest, the project group should have worked with and presented solutions differentiated by the level of ambition and required urban space funds, instead of whether the surface solution should be on one side or the other. Doing so, would have illustrated the consequences of the politicians' decisions (Hansen, pers. comm.). Thus, increasing their awareness and arguably, making them better suited to make the decision of whether to grant urban space funds. Furthermore, the inclusion of an intermediate solution would also allow for the possibility of granting a smaller sum, which, nonetheless, would have drastically changed the institutional frames in the project, if approved. Conclusively, applying for, and presenting, three different proposals differentiated by the degree of urban space funds required, and thus ambitions strived for, potentially increases the chance of gaining additional funds. Obtaining urban space funds, despite being a lower figure, would indeed eliminate some of the institutional complexities within the projects as the contradictions between the logics of urban space and water management would not be constructed.

The above presented changes in practices and practical understanding have shown how practitioners in Strandboulevarden have found new ways of navigating, coming with alternative suggestions to solve the problem at hand. If these changes are acknowledged, changes in practices for future projects might follow. Change in practices are, however, not the sole reverberation of the maneuvers taken. Institutional changes might also emerge due to challenges faced, and maneuvers taken, both in Strandboulevarden and other projects.

Institutional Changes

Through the empirical data of this thesis, it has become apparent that some institutional changes have already occurred. These institutional changes will significantly change the preconditions for future

cloudburst management projects to come. In the following, these institutional changes are presented and discussed in relation to their hypothetical impact on the challenges faced in the project of Strandboulevarden.

One of the major institutional changes, which can significantly change the practices and procedures in relation to the earlier phases of a project, is CKTs' introduction of a new level of plans; i.e. Master Plans. The objective of Master Plans being to look at an entire cloudburst branch and all its cloudburst projects as interconnected elements, mainly in relation to water management, but also in relation to urban space (Hede, pers. comm.; Steffensen, pers. comm.). CKT indeed has an ambition of creating a concrete Master Plan for each cloudburst branch, as described by Steffensen (pers. comm.). These Master Plans are intended to ensure that a holistic approach is taken from the get-go of all cloudburst management projects within the specific branch and thus represent a natural constituent in the cloudburst management toolbox.

For Strandboulevarden, a finished Master Plan would, for instance, result in clearer hydraulic frames from the get-go and thus, reduce the amount of resources spent in the project throughout the years due to changing frames (Hede, pers. comm.). Moreover, it could potentially have increased the likelihood of Strandboulevarden receiving urban space funds as the Master Plan goes further than 'Better Urban Spaces' in concretizing and prioritizing projects in relation to urban space considerations. However, developing a Master Plan for a cloudburst branch takes time, time which could result in a delayment of the project itself. As mentioned earlier, the extra phase for developing the project frames seems to have been beneficial for the project of Strandboulevarden, in the form of negotiating the different perspectives of water and urban space. From another point of view, however, one could argue that a Master Plan makes assumptions at a time, where one perhaps does not know better. The Master Plan could thus become a constraint depending on how rigid the frames of the plan are made and might thus lower future project groups' ability to negotiate creatively in their projects. This calls for an inherent flexibility in such plans.

Another major institutional change is the introduction of interdisciplinary efforts, which extracts general and principal issues and discussions from single projects (Hansen, pers. comm.). An example hereof is the challenge and clarification of institutional frames set and imposed by Water and EIA (ibid.). The result of which is saved resources and *"there might also come a more uniform answer, because we have experienced different frames and acceptances of what one can and what one cannot in different projects"* (Hansen, pers. comm.). Another example is what one can do with co-financed utility funds, which has been interpreted differently from municipality to municipality (Hansen, pers. comm.; Steffensen, pers. comm.). These interdisciplinary efforts will hopefully save a lot of resources in the projects to come, but they will doubtfully cover all aspects**.** As Torgard (pers. comm.) states, it is the first time the municipality is making a blue-green transformation in a distinct cultural historical urban space such as a boulevard - arguably marked as high value from an urban spaces logic's perspective - without money for spatial improvement. This cuts the solution to the bone, in which the landscape architects have an important task of making the best out of nothing (ibid.). Novel insights will undoubtedly unravel through the activities to come, not only from the experiences with Strandboulevarden, but also from potential future projects with similar restrictions. Thus, these interdisciplinary efforts should be seen as dynamic, continuous institutional changes and not as static fixed changes.

The last significant institutional change considered in this report, regards the systemization of knowledge-sharing and a holistic participation when developing new institutional frames. The knowledge-sharing efforts come in many forms, e.g. as interdisciplinary efforts, center meetings and networks for occupational communities or logics. Efforts, which seem to be needed. Hede (pers. comm.) believes that traditional, sectoral planners accustomed to work within the fields of architecture, traffic and urban spaces are seriously challenged by adding a layer of water management, due to the disparate conditions it implies and the degree of innovation it requires. This is also something, which the navigations presented in Chapter 6 indicated. Clearly, one needs to get an understanding of the conditions which diverting logics impose on the course of action. It is, furthermore, crucial that one has respect for other professions and the conditions that other practitioners work under to ease up the process (Hede, pers. comm.; Schmidt, pers. Comm.; Torgard, pers. comm.). In that regard, Hansen states:

"I think that people are good at embracing the different issues whether they are hydraulic or urban space related. I think that people have been open to understanding issues and professions which they have not been acquainted with before. [...] *That you then have diverting opinions and knowledge foundations, well there I believe that we are constantly approaching each other."*
(Hansen, pers., comm.)

An important aspect of this is to be exposed to the 'language' of other logics. Thus, an interdisciplinary effort, which concerns communication of concepts within water management aimed at establishing a shared concept-understanding, is planned for both CKT and other municipal departments that are a part of the organizational field (Hede, pers. comm.).

Another example of knowledge-sharing between disciplines unravels within regular center meetings within CKT. These meetings have, amongst others, facilitated the sharing of experiences made in specific projects and more general topics, seeking to increase the understanding of the various disciplines involved in the practice of cloudburst management (Steffensen, pers. comm.; Torgard, pers. comm.). Last but not least, a network for urban space considerations has been created, which, amongst others, are integrated in the process of developing a handbook for how to conduct a Master Plan (Steffensen, pers. comm.). These efforts will inevitably contribute to a more holistic endeavor for future projects to come.

Conclusively, interesting future research to expect is thus how the Master Plans and the development of the interdisciplinary approach will influence the definition of the 'good' solution in projects to come. Indeed, it becomes interesting to explore how projects, with similar conditions to the Strandboulevarden case, will be carried out in the future.

7.4 The 'Good' Solution – Now, Later or Never?

As mentioned, the 'good' solutions regarding Strandboulevarden entails different values and beliefs grounded in different logics. There are apparent uncertainties of how the project of Strandboulevarden in fact will turn out and whether it will reflect a 'good' solution. It opens for a

discussion of whether doing cloudburst solutions with solely utility funds actually is desirable. Whether the project will be beneficial for the urban space, only the future can tell. Central arguments arise in the discussion of whether such a project should be implemented in the future and what long term aspects this might have. This chapter will discuss these matters.

7.4.1 When to achieve the 'Good' Solution

First of all, finding the 'good' solution is a highly simplified statement, since - as has been argued for throughout this report - this is a profoundly complex project, with practitioners not necessarily only adhering to one logic, but being able to navigate the intricacy of the situation and with numerous aspects playing a part. This thus implies that the definition of the 'good' solution is more blurred and more complex to define in these kinds of projects. Though, as numerous interviewees mention, and as has been reflected upon in Chapter 5.1.3, a holistic approach is of paramount importance in this new type of project (Hansen, pers. comm.; Torgard, pers. comm.; Hede, pers. comm.; Laursen, pers. comm.). One key aspect of thinking holistically is to think about the long-term effects of a project. As Samset and Volden (2016) explain, there exists a paradox of myopic decisions, where "*long-term viability is the intention, but the planning horizon is too short, resulting in suboptimal choices that one will regret later"* (Samset and Volden, 2016, p. 309). As mentioned earlier, 'the climate does not wait', reflecting the urgency to take cloudburst management seriously. Accordingly, BOGL are attempting to avoid suboptimal choices. Being a requirement stated in the procurement material, BOGL are indeed trying to think long-term by making conscious design choices which allow for potential 'additions' if urban space funds were to become available at a later point.

"*What we actually end up doing, must be something which, later - when there are hopefully some urban space funds available - does not require to use urban space funds to remove anything. They should be used to hopefully add something extra. You can buy some benches for them. You can buy some furniture for it and put it here and it may also be that you can add a little bit of pavement here, but it should not be that you dig something up. It would just be a stupid way to spend the money. So it's very much about the pavement. It must be the right choices you make*."

(Schmidt, pers. comm.)

As such, numerous practitioners, especially those identifying with the urban space logic, are trying to think of ways in which the 'good' solution can potentially be reached by keeping a flexibility in the design, facilitating the possibility of adding quality to the urban space after completion. This entails integrating a longer perspective and the question of when one wishes to achieve the 'good' solution. Consequently, although *"one can hope that they succeeded in designing it in such a way that it is easier to build something on top afterwards. But the wholeness will still be lost*" (Hansen, pers. comm.). In effect, Hansen highlights that even with this approach;

"*the most annoying thing is that you only look at a section of Strandboulevarden. In other words, in terms of the urban space, you have a long, connected section in Copenhagen with this boulevard - as one of the few left in Copenhagen - and then you go in and alter something that maybe makes up one third or less of the area and make something distinctly different."*

(Hansen, pers. comm.)

As has been in the case of Strandboulevarden it really indicates that when the water management logic takes over because of financial frames, a project faces the risk of being limited in its possibilities

to be holistic. Is does not seem as if a 'good' holistic solution can be achieved at first point, but elements of it might be achieved by adding elements at a later stage, given that funds are allocated. Still, considering the rigid requirements for these projects, when looking at the placement of the solution, only the project area essential for the water management might be included, as was seen in Strandboulevarden (Chapter 6.X). It raises the concern that future projects might phase the same consequences and thus fail to look at an urban space in all its integrity.

It, furthermore, raises a question of time, and thus the question of when one wants to achieve the good urban space. Can we wait for the urban space elements, or are they necessary right away? One could indeed question the extent to which it is possible to upgrade the urban space at a later point in time, since one cannot just 'sprinkle' on some benches and a playing field if one has not thought holistically about the whole area beforehand (Hansen, pers. comm.). Accordingly, the extent to which it is possible to create a 'good' urban space in projects without urban space funds becomes questionable. As such an argumentation, to wait and see whether funds could be allocated sooner or later to achieve the full holistic solution is relevant. Even though the ambitions for the project, as earlier stated, is that it should bring more value to the urban space, one must not neglect the necessity of cloudburst management.

7.4.2 Integrated Cloudburst Management

As stated in Chapter 1, the fact that the weather is changing and more cloudbursts will occur, necessitates the implementation of these cloudburst projects in order to protect cities against floods (Københavns Kommune, 2012). This reflects back to the point made by Samset and Volden (2016), about how long-term thinking is important but that some things are easier to do now. One could then argue that it is possible to wait with implementing large cloudburst projects such as Strandboulevarden to the point where urban space funds can be allocated. Nonetheless, the need to manage cloudburst events is pressing. Thus, it seems that there is no time for waiting for funds to create urban space and that securing against floods is of the highest priority. It might then be easier to add more recreational urban space elements at a later stage. This, however, entails that the original solution takes this into consideration, which, according to the practitioners, requires holistic thinking from the start.

The reality though, becomes, as already stated, that the cloudburst solutions without urban space funds cannot achieve the same ambitions as other cloudburst projects such as Tåsinge square, mentioned in Chapter 1. It also brings into question a discussion of synergies as Hede (pers. comm.) mentions. In effect, another consideration with regards to defining the 'good' solution, is a discussion of the extent to which one should talk of 'more value' or 'added value'. As Hansen (pers. comm.) comments, the existing green carriageway on Strandboulevarden is primarily used by dog walkers and is not a very active urban space. Nonetheless, the area has a specific (historical) characteristic;

"It is really hard to say what is good and bad, because there is a holistic thing that will be lost. But then it's possible that even if there are no urban space funds, you can get some other urban qualities brought forth. It's hard to say."

(Hansen, pers. comm.)

In effect, although nothing is certain before the project is completed, there is a potential for Strandboulevarden to function as a new urban space. The extent to which this will represent an 'added' or 'more' value to the area, is hard to say. In effect, as Hede (pers. comm.) highlights, the

disadvantage with 'add-ons' is that a tree, a bench or a playground are not 'add-ons', and it is only as the project progresses that they will truly get a better sense of which 'add-ons' they are able to include. Hede presents a good way of differentiating between 'added' and 'more' value:

> *"In such a project here, if you want what is called 'more value' - and not the way Copenhagen municipality defines it - then you can talk about the 3's. It's called concurrence, harmonious thinking and synergy* [*samtidighed, sammentænkning og synergi*].
>
> (Hede, pers. comm.)

As Hede (pers. comm.) sees it, concurrence with urban space cannot be attained in this project, yet, there is a concurrence with nature, suggesting that some money is saved. "*Then there is harmonious thinking, that you can do well on paper. It is just a pity that you have to fragment it and then say that we have a harmonious thinking with urban space and* [water] *technology, but we need to keep it at the theoretical level."* (Hede, pers. comm.). Lastly, there is synergy, which according to Hede (pers. comm.), only truly occurs when concurrence and harmonious thinking are reached and when these do not only complement each other, but jointly result in a better product.

> *"You do not get the synergy by making an add-on. Then you just get two layers that are put on top of each other.* [...] *One can think of add-ons as the result of adding two things, whereas synergy it is a bit like multiplying two things. [...] The real 'more' value is created when there is synergy, because that is where you get the good project, where urban space and the technical* [water] *solutions support each other so much that you get more than if you made add-ons."*
>
> (Hede, pers. comm.)

This way of defining 'added' and 'more' value gives a good understanding of the difference, whereby it would seem that, in Strandboulevarden, it will be hard to obtain 'more' value due to the financial constraints. However, the green park stretch could arguably be seen as 'more' value since it provides not only a green recreational space, but simultaneously functions as a retention basin. Nonetheless, in the strive for the 'good' solution, the potential for future 'added' value seems paramount. As Hansen (pers. comm.) argues, it will be interesting to see the extent to which the flexibility to add more afterwards is thought for in the design of the finished solution, considering that this will also have an influence on whether the project reaches the 'good' solution. As previously stated, this is a desire stated by the municipality through the procurement materials. As Schmidt (pers. comm.) states;

> *The municipality were very interested in hearing about it and also wanted us to work on it in the second feasibility study, but it can also be a bit elaborative, so it was also a question of honorary.* [...] *But I do hope that we* [...] *may be allowed to dig a little bit further into it and say: "here is what we need to do, but you can also fold something more on top". So, without making it too detailed, but to make sure that these things are taken into account. Because if you want some special function and you didn't make room for it all, then it would have been nice to have planned for it beforehand*.
>
> (Schmidt, pers. comm.)

As this quote highlights, incorporating flexibility to sustain the potential for future 'added' value is something which both the municipality and BOGL actively strive for. Nonetheless, the extent to which there is room for such creativity and innovation is, once again, delimited by the lack of urban space funds. Because, one cannot argue that spending time on increasing the potential for urban quality has a water management functionality. This is one aspect which a changed practice regarding the budget proposals potentially could deal with. By not only applying for a large sum of money to make a 'good'

solution from the get go, but through also integrating the possibility for politicians to allocate a smaller sum of money, the likelihood of obtaining additional funds increases. A small sum of money might not contribute much to the 'good' solution on the short term, but it could enable resources to be spent on integrating a long term thinking and flexibility for future add-ons.

In conclusion, both the obtaining and potential for 'more' and 'added' value is heavily delimited by the financial logic in the case of Strandboulevarden. Thus, one can question whether cloudburst management projects should be carried out at all if no urban space funds are allocated.

7.4.3 Should Copenhagen continue this Kind of Project?

As described earlier, this project has a strong technical component from the get-go. In previous climate adaptation projects, such as Tåsinge square (Chapter 1), urban space funds were allocated, enabling a more comprehensive approach to unravel and fulfill desires beyond the technical ramifications. Yet, in the project of Strandboulevarden, the professional practitioners are strongly delimited by the strict financial purview which the project economy constitutes.

These economic restraints are the result of the 'construction target' (*anlægsmåltal*) - most often referred to as 'construction limit' (*anlægsloft*). It is an agreement between the National Municipal Organization (*KL*) and the government, which dictates how much money the municipalities can spend on construction in a given year (Kirkegaard, 2018). This of course, entails the need to prioritize when municipal politicians decide which projects to allocate funds for. As has been explained the lacking urban space funds for Strandboulevarden was a result of a political prioritization, one which is not elaborated or known. Steffensen (pers. comm.) explains, that in the Project Package 16, seventeen projects were proposed yet only two received urban space funds, suggesting that they have to wait for funds to complete the others - and it would seem that Strandboulevarden will not be the only project that has to be completed without urban space funds, the rest of the projects, they have to wait for the funds before plans are made (Steffensen, pers. comm.).

The construction target for 2019 has been lowered significantly in comparison to former years. Copenhagen, being the biggest municipality in Denmark, with numerous construction projects planned, has been especially affected by this. The result of this in Copenhagen is a construction target of 3 billion DKK, despite the fact that they were ready to implement construction projects for 5 billion DKK (Kirkegaard, 2018). The results may be a stricter political prioritization of what to construct or not to construct. Steffensen (pers. comm.) explains that the construction target will probably remain that low level the following years. I the light of this Steffensen (pers. comm.) explains that there will probably be more of these projects and that there will be more pressure on CKT to carry out these solely utility funded projects (Steffensen, pers. comm.).

Interestingly, as Steffensen (pers. comm.) recalls, two years ago, CKT would never have imagined making a cloudburst retention basin without having urban space funds as well. Copenhagen, however, still has an Architecture Policy which states that urban spaces must be maintained or improved during redevelopment (Ørsnes, pers. comm.). Accordingly, "*as an organization, we could decide to say that now we put all projects on standby* [until funds become available] *or we can try to find out what these co-finance funds can be used for"* (Steffensen, pers. comm.). In the Strandboulevarden project, this is reflected by the fact that there was an 'execution pressure' at CKT, whereby an internal deadline was set for the completion of the surface solution on Strandboulevarden to match the completion of HOFOR's cloudburst tunnel (Hansen, pers. comm.). There was a fear that the project would end up

being an inactivated investment if the completion of the surface solutions did not match the completion of the underground tunnels (Hansen, pers. comm.). Hofor is establishing several cloudburst tunnels around the city in order to deal with the cloudbursts. And these tunnels are then supported by the surface solutions. One could then argue, that they could miss out on creating synergies with these tunnel project if surface solution are not initiated because of a lack of urban space funds.

Furthermore, there is an overall execution pressure regarding the implementation of the Cloudburst Management Plan, which should be executed within twenty years (Københavns Kommune, 2012). This refers back to the argument made earlier, about how "the climate does not wait" and that climate change is a challenge to be dealt with now. The fact that such projects are continued despite the lack of urban space funds arguably seems beneficial. Furthermore, Toke (pers, comm.) expresses a positive side of things:

"*It is also an advantage because there are a lot of other projects that have been stopped because of the construction limit. But, because this project is a pure co-finance project, it won't be stopped. So that is an advantage, since the project is actually being made compared to a lot of other projects."*

(Toke, pers. comm.)

Indeed, the fact that the Strandboulevarden project is actually being carried out rather than stopped as a lot of the other construction projects in Copenhagen, can be seen as highly positive despite the lack of urban space funds. Still, one could also argue that, especially from an urban space perspective, waiting for the allocation of urban space funds could help create a better urban space project, which would potentially benefit the city more than 'only' protecting the area against floods. Nonetheless, the extent to which the involved organizations and actors are able to create synergies between the urban space aspects and the mandatory water management components - despite the economic frames - will be interesting to see. It is certainly not given and depends very much on how the practitioners navigate the different requirements, as has been discussed above (7.2.).

What the future will bring

As numerous interviewees reflect upon (Hede, pers. comm.; Torgard, pers. comm; Hansen, pers. comm.), the final product on Strandboulevarden might be slightly surprising for some - citizens, politicians and municipal staff alike - since missed opportunities will become apparent. Indeed, "*it will be the first time we get a picture of it and of what it can do. For better or worse. There will also be some of my architect colleagues in the administration who will think that you should never have done this."* (Torgard, pers. comm.). This statement could hint that there is not full consent about the extent to which making urban development without urban space funds is a good idea. Hansen (pers. comm.), furthermore, doubts that the politicians are fully aware or entirely understand the consequences of their decision, especially with regards to only considering a smaller section rather than the area in its integrity. As such, if the project should end up as a 'failure' because one had the expectation that it could do much more than it can, then Hede (pers. comm.) hopes that it becomes a learning point considered in future projects. Nonetheless, Hede also comments that;

"If we just have Strandboulevarden with roughly the same aesthetic design as it has today but with a technical add-on, well then I also think it is a good project. But I hope that this becomes a learning

point. No matter what, I hope that one can learn from it when it becomes apparent how much unreleased potential there is."

(Hede, pers. comm.)

It seems to be the story of Strandboulevarden; the unreleased potential. Various practitioners involved in the project are vigilant and observant of the end result of the Strandboulevarden project. Yet, considering the ardor and efforts made by everyone - especially by the practitioners abiding to the urban space logic - the project is just as likely to become a success as a failure. It can be debated which result is preferable. Considering the need for municipal politicians to prioritize, given the smaller financial frames for construction project, they might see the possible success of Strandboulevarden as beneficial. This might lead to more projects without allocated funds, since the politicians might think that they can have these holistic urban space cloudburst projects without allocating funds for them. This is only speculation, but it could lead to a desire for these kinds of projects not to be successful, since, from the practitioners' point of view, the 'good' holistic urban space solution is not possible to achieve on solely urban space funds. However, only time will show whether this is the case.

As Torgard (pers. comm.) explains, it is difficult to predict whether there will be more projects without urban space funds allocated in the future, since the main barrier at the moment is the construction limit. Consequently, at the moment, this cannot be foreseen, suggesting a need for future research, once Strandboulevarden is completed and the project has been evaluated.

8. Conclusion

As the increase in intense rain events and resulting floods in cities demonstrate, climate change adaptation is an imperative that cities need to act upon. It requires fundamental transformations of the management and planning practices in urban settings, representing a key institutional challenge, especially for municipalities, to deal with. Accordingly, this thesis provides valuable insights into one of the complex contemporary issues faced by practitioners within the organizational field of cloudburst management in an urban setting. Thus, these efforts need to be scrutinized, which this research seeks to address through the following research question:

Using the case of Strandboulevarden, how can practitioners - conducting cloudburst management projects that do not have any funds allocated for urban space development - navigate towards a solution, which contributes to the creation, or at least the maintenance, of the 'good' city?

Indeed, there are different interpretations of what it entails for the project, to contribute to the 'good' city. These interpretations are manifested in the institutions, organizations and institutional logics that constitute the organizational field of cloudburst management. In the project of Strandboulevarden, three institutional logics were found to be the main influencers on the course of action and end-objective, namely; *water management, urban space* and *finances.* Since various institutional logics co-exist, with different interpretations of what the 'good' solution encompasses, situations occur where the different logics are constructed as contradictory or incompatible. In this regard, the sole reliance on utility funds suggests a predominance, or prevalence of the financial and water management aspects in defining the 'good' solution, thus resulting in a negligence of the urban space aspects. This is further materialized in defining the project as a 'minimum' project, which constitutes a new type of landscape in the city, where aesthetics and architectural design is cut all the way to the bone, due to the technical and financial bindings.

Nonetheless, as has become apparent in this thesis, the practitioners involved in the Strandboulevarden project have actively sought to adopt a course of action where the urban space logic shines through, to the extent possible. The practitioners mainly characterize the 'good' solution as living up to the hydraulic requirements, while contributing to a green and usable urban space. An important point being that the solution does not degrade the urban space. This implies that practitioners from a variety of occupational communities are not only working against shaping the solution according to the logic which they mainly adhere to, but also according to other logics. These more or less deliberate maneuvers, or tactics, which seek to lessen or de-construct the contradiction between logics, are the main target of analysis in this thesis, as they enable a more synergetic definition of the 'good' solution.

These tactics mainly take point of departure in the fact that - despite the financial restrictions, which result in a project imposed by a strong hydraulic logic - the project is also subject to the conditions of planning in the public space. Thus, there are conditions which represent opportunities to shape and frame the design beyond the purview of the water logic. To do this however, there is a need to actively integrate these conditions and translate their implications for them to represent an opportunity for the course of action.

Notably, the tactics unveiled in this thesis might have worked in the situations analyzed, but due to the tactics being derived from a singular case study, they might not be applicable to other contexts.

This thesis concludes that framing is essential, especially in a project with many unknowns. A central frame in this regard, is of organizational character, namely the integration of various occupational communities into the project group. By composing an interdisciplinary project group, the presence and participation of practitioners from different occupational communities serves the function of ensuring the integration of certain values and ambitions and simultaneously helps translate the inherent demands to other practitioners. Similarly, using a Framework Agreements not only saves time but also allows for specifically selecting the kind of consultants assumed capable to complete the complex task. This also becomes significant as experience with navigating institutional complexities can result in hybrid practitioners. That is, practitioners who strategically can import or export elements of other institutional logics to further their own agenda. Furthermore, the integration of experienced practitioners in the project seems to increase the degree of innovation and lower the friction between logics.

Practitioners can further seek to shape the subsequent action by integrating rhetorical tropes and demands into the procurement materials, which frames the consultants' task. In this regard, an extra phase for materializing the frames proves to be necessary and, furthermore, constitutes a possibility for uncovering unknown possibilities. Here, the importance of dialogue becomes apparent, both amongst all the project group members and between the consultants, serving as a bridge which enables translations between the different logics involved to occur. This implies the need for platforms to facilitate dialogue and translation, e.g. project group meetings, design drawings and 3D models.

Looking forward, the institutions which revolve around the practice of cloudburst management continuously change. Future projects already face substantially differentiated preconditions since the practices and institutions change as a result of the experiences from practitioners working with institutional complexity through their everyday activities. Nonetheless, future projects are likely to be subject to similar financial restrictions, continuously generating complexities that constantly need to be managed - as it is now.

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Appendix

A: All Interview Guides