



Public-Private Collaboration in Climate Change Planning by Cities

A New York City Case Study

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Abstract

Cities around the world have to an increasing degree become major drivers of climate change planning. This thesis investigates the use of public-private collaboration by city governments during the implementation of these plans. The primary focus is to analyze government motivations to engage in public-private collaboration within climate change planning, its causal effect on the use of collaboration strategies, and novel trends within the use of such public-private collaboration strategies.

The thesis creates a theoretical framework that hypothesizes four types of government motivations and six associated collaboration strategies. The government motivations are resource aspects, efficiency arguments, legitimacy considerations, and innovation needs. The public-private collaboration strategies are strategic partnerships, joint venturing, procurement of contracts, outsourcing, collaborative networks, and procurement of innovation. The analysis is based on a case study of New York City and eight flagship climate change initiatives. New York City is a highly relevant case as it is a global frontrunner within climate change planning, with a comprehensive scope of climate change initiatives, and implementation starting earlier than many large cities.

Even though public-private collaboration strategies used in climate change planning by cities have received little attention in the academic literature, the case findings suggest that the overall theoretical framework is relevant also within this policy realm. In all analyzed initiatives, government motivations are found to be associated with collaboration strategies proposed in the theoretical framework. Subsequently, the thesis concludes that case findings support government motivations having a causal effect on the use of public-private collaboration strategy within climate change planning by cities. The thesis also finds that dual motives can exist within the same initiative, either simultaneously or in succession. Trends within government motivations include the relative frequent occurrence of resource and legitimacy motivations, the growing role of innovation motivation, and efficiency arguments based on vital data and technical know-how held by the private sector. Additionally, there was a trend to widespread use of collaborative networks and elements of strategic partnerships, even when this strategy was not the primary one.

Potentially influential novel collaboration issues, that the theoretical framework did not anticipate, are also investigated. The issues fall within three areas. Firstly, the policy issues of climate change; secondly, city centric structures; and thirdly, the involvement of specialized nonprofit organizations and scientists from local universities. This increases the complexity of public-private collaboration within climate change planning by cities, especially in two ways. The first being that private actors are becoming more critical to reach the policy goal of climate change initiatives, which in turn influences the division discretion, with initiatives increasingly being jointly developed and implemented. Secondly, it suggests that new extensive forms of public-private collaboration, including mixed forms, are developing. The trends within government motivation and collaboration strategies in combination with the implication of the novel collaboration issues, make up a movement within public-private collaboration in climate change planning by cities, which this thesis denotes ‘comprehensive climate cooperatives’.

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Preface

This thesis is a product of the many conversations and discussions I have had thanks to my time at Danish Cleantech Hub in New York City. This public-private platform arose as a response to the 2013 revision of PlaNYC, and this climate change plan has consequently become my professional bible. My interest in investigating public-private collaboration strategies in climate change planning by cities is therefore the outcome of my everyday interaction with the intricate challenges and thrilling opportunities PlaNYC entails for public-private collaboration. This thesis would never have come to look as it does without all the input from my colleagues at the Confederation of Danish Industry and in the Urban Future Lab, in addition to the many collaborative partners in the city government of New York City. I am thankful for them sharing their views, enlightening me on the workings of New York City, and taking the time to satisfy my eager to discuss public-private interaction.

A heartfelt thank you also goes out to everyone who has offered their moral support throughout the process of writing this thesis. It would have been a lonely journey without you.

CHAPTER 1: INTRODUCTORY

Introduction

“Mayors are turning their city halls into policy labs, conducting experiments on a grand scale and implementing large-scale ideas to address problems, such as climate change, that often divide and paralyze national governments”

Michael Bloomberg

Over the course of the last 10-15 years, Michael Bloomberg has become one of the most vocal and prominent voices within the need to rethink the scope and strategies to fight climate change. Two central approaches of his, especially developed during his time as mayor of New York City, have been the emphasis on cities as this century’s drivers of innovative climate change action and the need for city governments to interact with a much wider spectrum of stakeholders (Bloomberg, 2015). This thesis takes its offset in, and is inspired by, the climate change plans and the collaborative approach Michael Bloomberg advocated during his time as mayor of New York City. An approach he continues to promote through his current profession as C40 strategic funder, environmental philanthropist and U.N. Special Envoy for Cities and Climate Change.

Cities around the world have to an increasing degree become major drivers of climate change action, and in fact the “growth in the scale and nature of municipal responses to climate change has been one of the most significant features of the changing climate governance landscape over the past two decades” (Bulkeley, Broto & Edwards, 2012:545). The decade long standstill in creating international binding agreements on climate change, ended with the COP21 Paris Agreement in December 2015. Nonetheless, the international standstill had already spurred cities to become involved, and cities remain essential as urban areas account for the majority of greenhouse gas emissions worldwide. At the same time cities face the most damaging consequences of climate change, such as flooding and air pollution. The widespread adoption climate change plans by cities is only expected to increase in both numbers, scope and importance, which is why this thesis will investigate this particular policy realm (Bloomberg, 2015).

The acknowledgement that this kind of environmental governance is here to stay, in turn raises an array of questions. Is this the most effective way to fight climate change? Do cities have the capabilities to address such a complex and comprehensive policy realm? How do climate change plans vary from city

to city, from continent to continent? All these are questions of great importance, but this thesis will be limited to evolve around one central issue, namely Michael Bloomberg's collaborative approach to climate change. This approach emphasizes that successful climate change planning undertaken by city governments must be supported by innovative forms of public-private collaboration.

This view is in itself not unique as it is widely accepted that if "done well, collaboration create synergies between governments and private participants, allowing them together to produce more than the sum of what their separate efforts would yield" (Donahue & Zeckhauser, 2011:5). Yet the use and form of such collaborations vary a lot, and the motivation of governments to engage with the private sector also differs. This has arguably contributed to making public-private collaboration subject to extensive theoretical and empirical analysis for decades. In addition, collaborations are continuously being developed, because as governments face new challenges, public-private collaboration is extended to new policy realms, such as climate change planning by cities. It is precisely this development where collaboration strategies are used in new policy realms this thesis will investigate.

Research Question

The focus of this thesis is to investigate what influences public-private collaboration strategies in climate change planning by cities. In order to narrow the scope of this thesis, the analysis will focus only on how city government motivations to engage in public-private collaboration influence the collaboration strategy. This will inform a discussion of possible trends and developments within public-private collaboration in climate change planning by cities. The limited focus on government motivations as an explanatory mechanism has been chosen due to the central role it has received in the public-private collaboration literature. This thesis will also be limited to primarily investigate collaboration strategies used in the implementation of climate change planning.

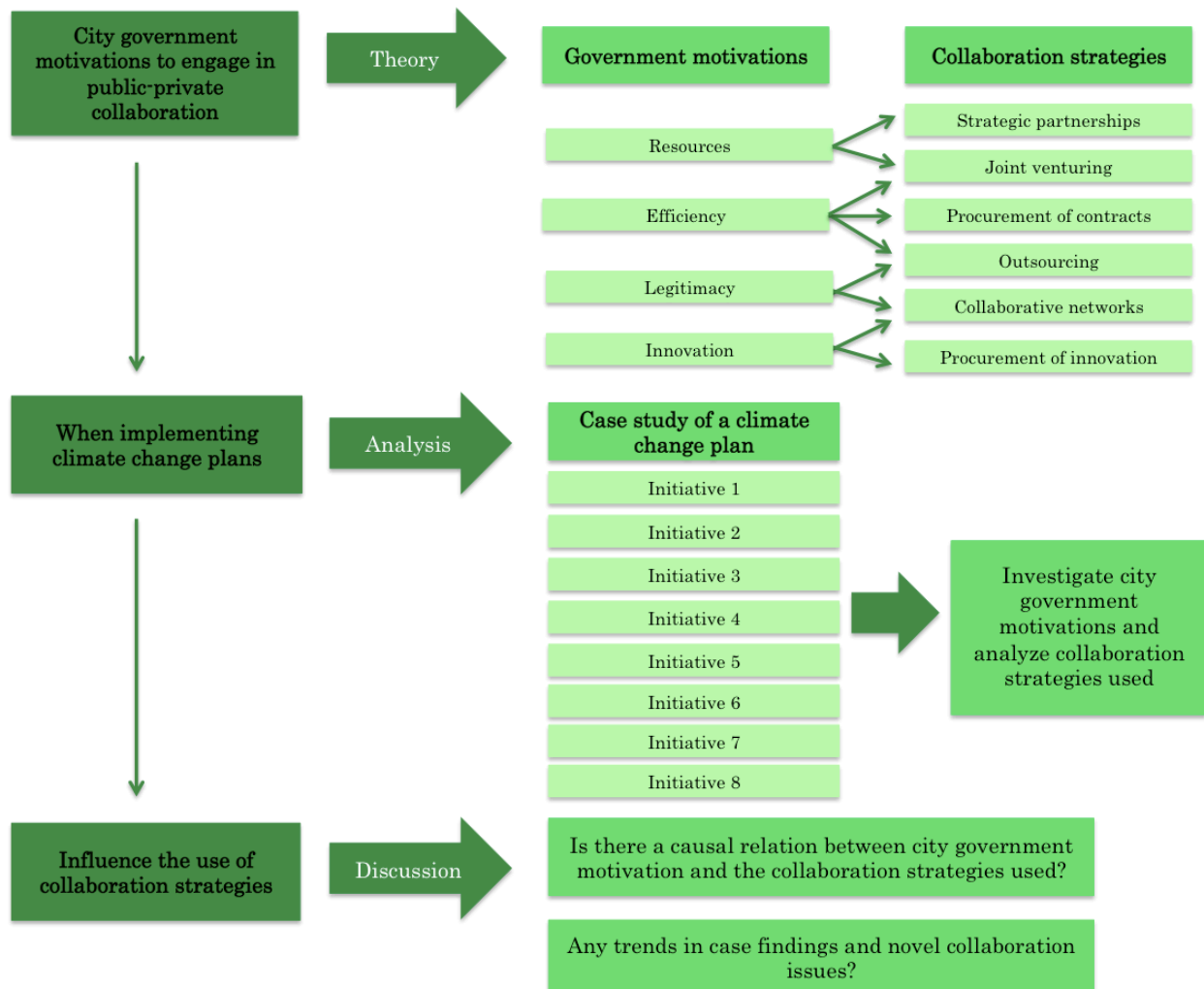
The research question is:

How do city government motivations to engage in public-private collaboration when implementing climate change plans influence the use of collaboration strategies?

In order to answer this question, three successive sub questions will be investigated. Firstly, theoretically what motivations do governments have to pursue public-private collaboration and how are these associated with collaboration strategies? This will be dealt with by developing four theoretical hypotheses, each focusing on a potential motivation for governments to engage in public-private

collaboration and associated collaboration strategies. This will become the theoretical framework of this thesis. Secondly, what government motivations and collaboration strategies can be observed during the implementation of climate change planning in cities? This question will be investigated through empirical case study analysis. And thirdly, can the finding from question two supports the theoretical framework created in question one? This will enable a discussion of causal effect and a discussion of trends within collaboration strategies used specifically in climate change planning by cities.

Figure 1: Operationalization of the Research Question



Structure

Chapter 1 presents the topic of climate change planning by cities, its relevance in a global setting, and the intention of this thesis to investigate public-private collaboration within the policy realm of climate change planning by cities. Against this background, the research question of this thesis is: How do city government motivations to engage in public-private collaboration when implementing climate change plans influence the use of collaboration strategies?

Chapter 2 introduces the methodology that will guide this thesis. Based on the critical realist philosophy of science, the research design is a case study of climate change planning in New York City. This chapter also clarifies principal terminological considerations and assumptions of this thesis.

Chapter 3 begins with a literature review, to give an overview of the exciting academic literature that relates to this thesis. Subsequently, the chapter focuses on developing the theoretical framework. Four theoretical hypotheses, each outlining a type of motivation for engaging in public-private collaboration and the associated collaboration strategies are developed. The four types of government motivations are resource aspects, efficiency arguments, legitimacy considerations, and innovation needs. The associated collaboration strategies that follow from each of these motivations are strategic partnerships, joint venturing, procurement of contracts, outsourcing, collaborative networks, and procurement of innovation. The chapter concludes with a section on data, which will all be written sources, and the operationalization of the analysis.

Chapter 4 starts with an introduction to climate change planning by cities and the case study of the New York City. The rest of the chapter analyzes the selected initiatives, including the goal of each initiative, government motivation, and the public-private collaboration strategy used. The initiatives are the High Line Park, MillionTreesNYC, the Carbon Challenge, the Retrofit Accelerator, the East Side Coastal Resiliency Project, the Green Infrastructure Pilot Program, the Storm Hardening and Resiliency Collaborative, and finally the Newtown Creek Plant.

Chapter 5 entails the principle discussion of this thesis, where the first section highlights how the causal effects outlined in the theoretical framework generally are supported by the case findings. This section also discusses trends within government motivations and the use of collaboration strategies. The second section examines novel collaboration issues that also influence collaboration strategies, which the theoretical framework does not anticipate. These issues are policy issues of climate change, city centric structural issues, and the involvement of specialized actors. The trends and the developments highlighted by the novel collaboration issues do in combination make up a movement towards ‘comprehensive climate cooperatives’.

Chapter 6 sums up the central conclusions of the thesis and answers the research question. The chapter also includes reflections on the generalizability of the conclusions, theoretical and real-world implications of the case findings, and future avenues of research.

CHAPTER 2: METHODOLOGY

Philosophy of Science

This thesis is founded upon the critical realist philosophy of science, as Andrew Sayer describes it. It is subsequently based on the ontology that “the world is differentiated and stratified, consisting not only of events, but objects, including structures, which have powers and liabilities capable of generating events” (Sayer, 1992:6). This implies that a reality does exist independently of observers and that underlying structures can be seen reflected in explanatory mechanisms. This understanding is also reflected in the critical realist approach to causality, as it aims to answer ‘what explanatory mechanisms led to certain outcomes?’ A causal effect is therefore one that uses structures, to explain mechanisms, which in turn cause certain outcomes. This is highly important to this thesis, as it implies that the investigation should be build upon the identification of possible mechanisms, which each in their own right can explain events. Below figure illustrates how the research question and investigation of this thesis are based on critical realist philosophy, including the focus on identifying explanatory mechanisms, as to explain events.

Figure 2: Critical Realism in Context

	Underlying structures	Explanatory mechanisms	Outcomes / events
Critical realism	Objects in the social world have structures	Parts of the structure with causal powers	Observable behavior
In this paper	Structures of climate change planning and environmental governance	Motivations to undertake public-private collaboration	Collaboration strategies

The fact that the critical realist philosophy of science allows interconnected mechanisms to be investigated in isolation is also reflected in this thesis’s analytical approach. Nonetheless, it should be noted that “in practice such formal explanations will not normally be possible because of the complexity of real world behavior, but they do provide a logical framework to guide case researchers” (Easton, 2010:122). This thesis is therefore limited in its ability to definitively identify which explanatory mechanisms, or part of the underlying structure, influences events. But through the construction of a framework insight can be obtained. To this thesis, this also implies that government motivations may not be the only explanatory mechanism that influences the use of collaboration strategies. More so, evaluating the strength of any causal effect found is outside the scope of this thesis. The implication is

also that science should be understood as an ongoing process, to improve the understanding of the mechanisms that it studies.

Another consequence of the critical realist philosophy is that knowledge is not immune to empirical check and its effectiveness in informing and explaining observable behavior is not an accident. However, the epistemology of critical realism assumes that knowledge always will be incomplete and fallible (Sayer, 1992). In this thesis, this epistemology will be reflected in the use of theoretical eclecticism, as the guiding principle for theory selection, and the subsequent theoretical framework. This eclectic approach is also chosen as the critical realist methodology allows for the application of many theoretical traditions, as these choices should depend on the event under investigation (Easton, 2010).

Research Design

Based on the critical realist philosophy of science, it is evident that the research design of this thesis must accommodate an analysis based on investigating explanatory mechanisms, in a complex real world. For this reason, the thesis will conduct its analysis based on a case study method, as this method “is particularly well suited to [study] relatively clearly bound, but complex, phenomena” (Easton, 2010:123). The primary challenge is to develop a case study research design that can investigate the explanatory mechanisms but also the causal effect on the outcome.

According to case study theory by Gerring (2004) this poses a challenge in terms of selecting a case study research design. Whereas a single case is most useful when analyzing and identifying explanatory mechanisms, a cross-unit study comprising of more cases, is preferable if investigating causal effects. However, as the first analytical step in this thesis must be to actually investigate government motivations, in order to be able to say anything meaningful about the causal effect on collaboration strategies, a single case study design is chosen. Choosing a single case also entails other advantages such as increasing the depths and descriptive ability of the case study, which may enable the exploration of other explanatory mechanisms. A single unit case study method is also well suited in exploratory research where theory building may be relevant (Gerring, 2004). This is also fitting as this thesis sets out to create a theoretical framework that to a limited degree has been used on climate change planning by cities.

Furthermore, theory on single unit case studies implies that there is “three logically conceivable approaches to the intensive study of a single unit where that unit is viewed as an instance of some

broader phenomenon” (Gerring, 2014:343). Single unit case studies have to either include a within-unit spatial variation, a temporal variation, or as a third option both variations. Breaking down any climate change plan into within-unit spatial variation, will possibly limit this thesis in investigating comprehensive climate plans that include initiatives within many sectors. This ability will be important as climate change planning is especially interesting as a new policy realm, because it draws on numerous kinds of complex interconnected cross-sector initiatives. Within-unit spatial variation is therefore found to be improper. Instead this thesis will be a case study that “examines variation in a single unit over time, thus preserving the primary unit of analysis” (Gerring, 2014:343). This subsequently implies that the case chosen should have an element of temporal variation.

From a critical realist perspective, the ability to generalize any findings stem from the focus on explanatory mechanisms. Only focusing on a single case does challenge this ability (Easton, 2010). This is because “given that consciousness is so context-dependent, it is doubtful whether accurate general statements about things like culture can be derived from limited personal experience or individual case studies” (Sayer, 1992:240). In order to address this challenge, this thesis will base its concept of generalizability on Yin’s (2013) notion of analytic generalization. Analytic generalization involves estimating the likely transferability of findings, based on context. Hence, findings are generalizable to the degree that other cases would show circumstantial similarities.

The logic used in this case study is retrodution, which is also a consequence of the critical realist approach to philosophy of science. Retrodution is a “mode of inference in which events are explained by postulating (and identifying) mechanisms which are capable of producing them” (Sayer, 1992:107). Retrodution allows this thesis to focus on government motivations and collaboration strategies, and the relevance of these within case study, by moving backwards and forwards in the analytical processes. Hence, it becomes an iterative process by which identification can occur. This process allows this thesis to identify government motivations and collaboration strategies, both through an eclectic theoretical approach and the case studied.

Case Selection

With the research design in place, the next step is to select an appropriate climate change plan and city to study. Based on the research design a suitable case should firstly be comprehensive enough in scope to ripe the advantages of only looking at one case. This will increase the likelihood of it including as many

types of government motivation and forms of collaboration that are appropriate within climate change planning by cities. As the research design also allow an analysis to potentially identify other explanatory mechanism, a comprehensive case will likewise increase the chance of this to occur. Secondly, the research design prescribes that the case study should include temporal variation. The most straightforward way to ensure this is by choosing a climate change plan that has been developed or upgraded over time. Selecting a city that also has been implementing climate change plans over a longer time period also ties into the notion about selecting a comprehensive case. In combination this implies that the city chosen should be among the frontrunners of comprehensive climate change planning. This will also benefit the ability to analytically generalize the findings, as choosing a city that is a global frontrunner within climate change planning, with a comprehensive scope of climate change initiatives, imply that it is likely to reflect higher degrees of circumstantial similarities with other cities.

Around 70 cities so far have committed to reducing their greenhouse gas emissions by 80-100%. (The Climate Group, 2015). As to reach these goals, cities have to a growing degree used more comprehensive environmental governance and climate change planning. According to the Climate Group (2015) a lot of smaller cities are among the most ambitious cities. Many of these with less than 1 million inhabitants, which due to the size of the city is found not to be suitable cases, due to the limited portfolio and scope of initiatives and scale of public-private collaboration. Also larger cities like Melbourne and Seattle are found unfit according to the research design, as both cities have only adopted one climate change plan and have not adopted updated versions or revisions (Melbourne, 2016 and Seattle, 2016). Two cities stood out, Copenhagen and New York City. Both have comprehensive plans and fulfill the criteria of temporal variation. At the same time, these two cities are the best performing within their respective regions on climate governance (Siemens, 2016).

Copenhagen

Copenhagen did in 2009 adopt the Copenhagen Climate Plan, with the goal of reaching a 20% reduction in green house gas emissions by 2015. As this goal was reached already in 2011 the Copenhagen Climate Plan was updated in 2012 with a goal to be CO2 neutral by 2025 (Copenhagen, 2012).

From 2013-2016 Copenhagen estimates to invest \$1.5 billion in energy retrofits, green transport, and climate adaptation (Copenhagen, 2013).

New York City

New York City put forward its first climate change plan in 2007, called PlaNYC. The goal was to cut green house gas emissions by 30% by 2030. PlaNYC was updated in 2011, 2013 and in 2015. The goal currently to limit emissions by 80% by 2050.

New York City will between 2015-2025 invest \$28 billion in resiliency and climate adaptation and an additional \$40 billion in the water and energy sector (New York City, 2015a).

The major difference between these two cases is especially the size and scale of the plans, and the subsequent potential extent of public-private collaboration involved in the implementation of plans. Even when considering the difference in investment horizon, and New York City being roughly eight times bigger than Copenhagen measured by inhabitants, the level of investment by New York City is still considerably more comprehensive.

Against this background, New York City and its climate change plan, PlaNYC, will be the case study analyzed in this thesis.

Terminology

This section will outline the principal terminological considerations and assumptions in the thesis. The intention is to clarify how specific terms are defined and used throughout this thesis.

Four key terms, established by the research question, are used continuously throughout this thesis. The two first are related to government and governance, the second two are related to public-private collaboration. The first term is *city government motivations*. This thesis treats city government as one cohesive entity and does not distinguish between motivations that stem from the legislative branch and the city bureaucracy. Government motivations will also assumed to be rational and informed motives of well functioning governments. Secondly, *climate change plans* will include all types of approved plans or strategies that either mitigate climate change or adapt to climate change. Mitigation initiatives will in general be reflected in sustainability initiatives, such as reduction targets. Adaptation is closely related to resiliency initiatives, which for instance are flood protection measures. Climate change plans by cities is also considered a new policy realm within the broader heading of environmental governance. Environmental governance is used “to refer to the set of regulatory processes and organizations through which political actors influence environmental actions and outcomes” (Lemos & Agrawal, 2006:3).

Thirdly, *public-private collaboration* in this thesis is defined as “the pursuit of authoritatively chosen public goals by means that include engaging the efforts of, and sharing discretion with, producers outside of government” (Donahue & Zeckhauser, 2008:49). This is intentional a very broad definition of public-private collaboration, as not to limit the collaboration strategies investigated. The fourth key term used in the research question is precisely this notion of *collaboration strategies*. Like Donahue & Zeckhauser (2008) this thesis finds collaborative strategies to be the means with which governments

reach their goals. Collaboration strategies are therefore the “dynamic relationship among diverse actors, based on mutually agreed objectives, pursued through a shared understanding of the most rational division of labour based on the respective comparative advantages of each partner” (Brikerhoff, 2002:21). As public-private collaboration is defined so broadly, collaboration strategies can according to Hodge & Greve (2007) include nearly all sustained activities between the private sector and government. Collaboration strategies can be any kind of functional interaction or “form of agency relationship between government as principal and private players as agent” (Donahue & Zeckhauser, 2008:31).

This in turn implies that collaboration strategies include many structures of shared discretion between the government and private sector. Sharing discretion will in this thesis refer to allowing an external actor some degree of influence. Discretion can have many forms and degrees, but it is central in shaping the potential, the risk, and the strategic complexity of the collaboration. This thesis will specify types of discretion, which can be either production, payoff, or preference discretion (Greve, 2010). Production discretion refers to the means by which a goal is achieved or produced. Payoff discretion refers to the payment and economic distribution within the collaboration. Lastly, preference discretion refers to the influence on specifics of the goal itself.

The six collaboration strategies are set out in the theoretical framework. These are:

Strategic partnerships, which are long-term relational collaborations, based on trust and mutuality, but possibly with elements of formal contracts. Government and private sector will in principle be in a dialogue and collaborate on decisions concerning the entire formation and implementation phase of an initiative (Hodge & Greve, 2007 and Skelcher, 2007).

Joint venturing is defined as a “contract between government and private partners covering capital works and subsequent operating costs” (Skelcher, 2007:354). To varying degree the government stays involved in the project. This is often infrastructure related investments and projects, where the government specifies the project outcomes, and where the private partner in turn for future revenue streams provide capital resources.

Procurement of contracts where the government through contracts with the private sector gets a specified product or service and in turn pays the partner. “The specification is done prior to the deal, so in principle, the provider just has to comply with the instructions given in the contract to deliver the product or service in question” (Greve, 2010:588).

Outsourcing which in this thesis is defined as the private sector delivery of service that are true public goods or semiprivate goods. It is the middle ground between joint venturing and procurement of contracts, as outsourcing essentially includes taking over more extensive functions previously held by the public sector (Donahue, 1989 and Donahue & Zeckhauser, 2011).

Collaborative networks are a form of network governance that consists of stable, horizontal, and interdependent but operationally autonomous actors. These actors then contribute to the production and implementation of public visions, ideas, plans and regulations (Sørensen & Torfing, 2005).

Procurement of innovation will in this thesis refer to public procurement that attempts to open up for innovation possibilities without necessarily targeting new products. Instead governments deliberately use innovation criteria in tender documents or focus on the functional specifications. This is a more narrow definition of procurement of innovation, than scholars such as Rolfstam (2012) who in more broadly defines innovation of procurement as all “purchasing activities carried out by public agencies that lead to innovation” (Rolfstam, 2012:5).

Other terminologies used in this thesis include *innovation*, which is defined as a “complex and iterative process through which problems are defined, new ideas are developed and combined, and new solutions are implemented, diffused and problematized” (Hartley, Sørensen & Torfing, 2013:826). The term *wicked policy problem* will also be used. The concept is based on the writings of Rittel & Webber (1973) and their ten characteristics of a wicked problem. In principle these are multidimensional policy problems that are difficult to resolve due to incomplete or contradictory information, where views on the nature of the problem differs, and which include complex interactions with other issues. In this thesis climate change planning by cities is perceived to be a wicked problem. Lastly, climate change planning by cities will in this thesis be perceived as a *true public good*, or at least close to, as all citizens generally share benefits of this type of government-funded action to an equal degree. However, the thesis recognizes that some initiatives included in a climate change plans are semiprivate goods, such as improvement of a neighborhood park or coastal protection (Donahue & Zeckhauser, 2011).

CHAPTER 3: LITERATURE

Literature Review

This section will focus on previous academic writing relating to the research question. The objective is to place this thesis within the large body of work that already exists, but also to substantiate where this thesis may be able to create additional insights. This literature review is a three-step process. The first step being to identify and obtain an overview of the existing literature related to public-private collaboration. In the same fashion the second step entails exploring literature related to climate change planning by cities. Subsequently, the third step will be to investigate literature that combines both these topics, and especially the New York City case.

The below table entails a numerical overview of key literature search results. Many of the results within these searches have very little actual relevance. In a qualitative screening only a fraction was found significant to this thesis, which is the literature that will be the basis for the rest of this review. Nonetheless, the overview greatly illustrates that an extensive amount of literature exists within public-private collaboration, and a rapidly growing body of work focused on the new role of cities in climate change is also present. In contrast, only a limited body of literature focuses on public-private collaboration in combination with climate change planning by cities.

Table 1: Literature Review

Combination of search words	EBSCO International peer reviewed articles		REX Books registered by the Danish national	
	All fields	Title only	All fields	Title only
Step 1				
Private + public + partnerships	7549	1477	3950	201
Private + public + cooperation	4692	71	2836	29
Private + public + collaboration	617	93	1609	55
Step 2				
Climate change + urban	542	173	2769	151
Climate change + city	416	152	1359	64
Climate change + governance	412	177	2870	235
City + climate change + strategy	16	2	229	14
Climate action + strategy	36	5	434	22
Step 3				
Climate change + New York City	43	18	190	4
Climate change + private + public	17	3	946	9
PlaNYC	8	3	4	0
Climate change + private + public +	3	1	28	1
"all fields" refers to a search where there will be a hit if all search words can be identified in one of the available search fields, including abstract, subject and title. "Title only" is a limited search result where a hit only will be registered if all search words are present in the title of the literature.				

Literature on public-private collaboration stems from a variety of different academic traditions, including political science, economics, and public management. Political theories, such as pluralism and later corporatism, introduce notions of business influence and pluralist policy processes, both central to developing a further understanding of public-private collaboration (Donahue & Zeckhauser, 2008). The field of economics has likewise approached public-private collaboration from a variety of different perspectives. Game theory, transaction cost theory, and principle-agent relationships, all include insights into the dynamics of particular collaborations. In addition, new institutional economics contribute to the understanding of the importance of institutions and governance. Among the originators of new institutional economic theory is Oliver Williamson, who in Williamson (2000) takes stock of the essential contribution of the theory in evolving neoclassical economics into incorporating institutional milieu and governance. Closer to the principle focus of this thesis, on contemporary challenges for governments in the use of public-private collaboration, is new public management. The key being that greater market orientation in the public sector can lead to more cost-effective management, also through the use of collaborative arrangements. Christopher Hood is a central scholar within new public management. With his latest publication on U.K. public reforms the last 30 years, he evaluates the use of public-private collaboration and the “attempts to bring greater business efficiency to government by corporatization, performance indicators, new financial frameworks outsourcing, performance-related pay, and more emphasis on effective management” (Hood & Dixin, 2015:1). However, fundamental to the literature review is the sizable contributions by John Donahue and Richard Zeckhauser in creating a structured framework of public-private collaboration. Their work will be a theoretical cornerstone in this thesis.

Literature on climate change planning by cities likewise draws on a broad spectrum of academic fields. Areas within political science and especially governance related issues are most closely related to the current theorizing over climate change plans. Environmental governance did in the 1960's focus on particular agents of changes such as state and market actors, but the importance of institutions and process of governance became prevalent areas of research in the decades to follow (Lemos & Agrawal, 2006). As the ideas of international action on climate change developed, academic scholars within the field of international relations developed theories of global environmental governance. Rodger Payne was among the first to explore this topic, and especially the role of non-governmental organizations in this international policy realm. Payne (1996) also examines the importance of international institutions in environmental governance. In parallel, literature concerned with subnational environmental governance and decentralization of authority emerges. In this context, various scholars suggest that cities, rather than

nation states, may be the most appropriate arena through which to pursue policies to address specific global environmental problems. Out of this tradition stems Harriet Bulkeley, who within the last ten years has published extensive amounts of literature on cities and climate change policy. Betsill & Bulkeley (2005) are among the first to analyze the capacity of local governments to enact climate protection policies, and in their 2013 revision they examine ways in which climate change is shaping urban agendas (Bulkeley & Betsill, 2013). She also writes on public-private interaction and in one of her recent studies she is “examining the relation between state/non-state and public/private through an analysis of the governance of climate change in two global cities, London and Los Angeles” (Bulkeley & Schroeder, 2011:744). Harriet Bulkeley’s research will be central in this thesis, in combination with the rapidly growing literature that have arose the last few years within this field.

In terms of literature that combines both public-private collaboration and climate change planning by cities, the volume remains very limited. Writing by Harriet Bulkeley provides theoretical notions on the policy phenomenon, but her case studies have so far not evolved around New York City. However, a growing body of work has arisen, which on a case study basis examines climate plans adopted by cities. One of the most extensive analyzes 25 Dutch cities and their climate change plans, investigating both the level of anchoring in policy, organization and practical implementation, and the externalization of climate change plans towards private and societal actors (Exter, Lenhart & Kern, 2015). More statistically oriented studies have also provided peripheral insights into to the use of public-private collaboration in climate change planning by cities. Boyd & Juhola (2015) analyzes 627 urban climate change experiments from a sample of 100 global cities, while Lee & Koski (2015) conduct a study of climate actions in all U.S. cities with populations greater than 50,000 people. Through a multi level governance analysis they conclude that climate action efforts of cities and states are complementary, rather than attenuating. Both these statistical studies include examples from New York City. In general, academic literature does exist concerning New York City and its climate change plans. William Solecki and Yosef Jabareen being among the most active, their primary goal is to evaluate the effectiveness of PlaNYC. (Solecki, Patrick & Sprigings, 2015; Rosenzweig & Solecki, 2010; Jabareen, 2013 and Jabareen, 2014).

It is evident that public-private collaboration theory and to a growing degree literature on climate change plans by cities are well developed. However, in terms of placing this thesis within the existing literature, there are few studies that so far in depth combine or apply the existing collaboration theory with climate change planning. Very little academic literature has likewise been developed on how New York City

specifically has approached public-private collaboration, even though Michael Bloomberg, who initiated PlaNYC, is renowned for his approach to public-private collaboration. This is the literature gap this thesis intends to investigate.

Theory

This section outlines the principal theoretical foundation and hypothesis of this thesis. Based on the research question, identifying government motivations to engage in public-private collaboration and the causal effect on collaboration strategies will be the primary focus. The outcome will be a theoretical framework that outlines government motivations and the associated collaboration strategies. Based on the critical realist approach and the research design, theory selection is eclectic.

A principal reason to investigate government motivations as an explanatory mechanism, also in relation to climate change planning by cities, is due to the extensive academic attention this aspect has received. Flinders (2005) defines four reasons for the rise of British government engagement in public-private interaction in the 1990's. These are increased project efficiency, improved accountability, to obtain assistance with managing administrative complexity, and to share financial risks. Linder (1999) categorizes government motivations according to six categories. These are the wish to undertake internal management reform, to engage in a problem conversion, to obtain moral regeneration, to shift risks, to restructure public service, and to develop power sharing. Donahue & Zeckhauser (2011) do in their book on public-private collaboration also create a framework based on motivations. This consists of two overall incentives, either better outcomes or more resources. Better outcomes can stem from productivity arguments, better information or legitimacy consideration, whereas recourse aspects are defined primarily as financial. In more general terms the public-private collaboration literature has been centered around three overall headings, namely planning and whole-of-life costing arguments, private finance aspects, and the need to spur innovation in public projects (Greve, 2010).

Based especially on the last two categorizations, this thesis will focus on four potential public-private collaboration motivations from a government perspective. These are resources aspects, efficiency arguments, legitimacy considerations, and innovation needs. The writings of John Donahue and Richard Zeckhauser will be the underpinning when outlining each of these four types of government motivations. However, each of the four theoretical hypotheses will also draw upon an additional scholar. This enables this thesis to roll out more theoretical arguments and collaboration strategies associated with each of

the four government motivations. The first subsection on resource aspects will draw on literature by Chris Skelcher, who focuses on the interaction between government, resource driven partnerships, and democracy. The second subsection on efficiency arguments includes writings by Carsten Greve, who accumulate a range of efficiency arguments and evaluates outcomes of public-private collaboration. The third subsection on legitimacy considerations will draw on theory developed by Jennifer Brinkerhoff, on the critical need for legitimacy in public-private interaction. Lastly, the fourth subsection on innovation needs will be based on theory about innovation in public services and policy developed by Jean Hartley.

Before taking a deep dive into these different government motivations and the subsequent collaboration strategies, it should be noted that these are based on theory developed to explain a range of different collaborative forms and terminologies on public-private interaction. As this thesis applies a very broad definition of public-private collaboration, this is in line with objective of the thesis. More so, the critical realist philosophy of science implies that both government motivations and collaboration strategies quite possibly are more complex than what this section may depict. This is supported by the argument that “multiple rationales usually apply in any particular collaboration” (Donahue & Zeckhauser, 2011:123). Hence, the theoretical framework created will include simplifications and contextually may be limited.

Resources

A wide variety of academic literature exists on how the lack of financial resources has motivated governments to collaborate with the private sector. The primary motivation being that private finance can come to governments' rescue so that new projects can be build without making the government raise taxes from citizens. More specifically, motivations tend to center around either balance sheet considerations or shared risk and discretion aspects.

Skelcher (2007) finds that balance sheet motivation may arise if governments find it attractive to limit the upfront capital financing of a public project, so it will not add to public debt. “The infrastructure is treated as incidental to the output, with the benefit that it will not be reflected on the public sector balance sheet” (Skelcher, 2007:356). This notion also implicitly implies that citizens are unwilling to provide capital, which in turn should raise questions about whether it is a true public good. The fact that not all government projects are true public goods can in itself also be a motivation for resource collaborations. If aspects of a project provide benefits that are directed to narrower groups of society, the motivations to share the investment with those that benefit can arise (Donahue & Zeckhauser, 2008).

The second motivation for involving private sector finance is to transfer some of the risks of the project to private partners. Risks include those associated with planning, design, construction, implementation, performance, cost and residual value (Skelcher, 2007). Donahue & Zeckhauser (2011) further investigate this rationale and view it from the perspective of the actor who provides financial resources. In order to provide funds the private actor is likely to want influence on how the money to some degree is spent and demand a level of shared discretion. Allowing the private actor influence and discretion may actually be an advantage, as financial partners and especially nonprofit organizations or philanthropic partners “are likely to be much more generous in support of the project if they can influence or put their stamp on its destiny” (Donahue & Zeckhauser, 2011:37). This also touches upon another important distinction, namely between nonprofit and profit seeking private sectors. This thesis considers both kinds as private actors, as both are privately controlled and can have vital roles in collaborations “that arise from the combination of public and private resources in pursuit of public policy goals” (Skelcher, 2007:363). This thesis also recognizes that there these types of actors in other instances can be very different.

Both these types of resource motivations are also closely related to the next subsections on efficiency and innovation, because projects with provision of private capital are argued to benefit from more efficient management and avoidance of excessive cost in the construction phase. This is in essence a whole-of-life cost argument. Involving private financial resources can possibly also encourage the use of innovative solutions, since the project goal is often specified in terms of outcome (Skelcher, 2007).

Resources - Collaboration strategies

Especially two collaboration strategies have been associated with resource motivation. These are joint venturing and strategic partnerships.

Joint venturing involves governments authorizing or commissioning of a project and specifying the outcome. The private actor finances, builds, manages, and/or operates the facility. This collaboration strategy often includes fixed long-term contract that specifies how the project is to be operated and how the private actor is to recoup its investment. The government may still be involved in the project and maintain a leadership role (Skelcher, 2007). This is a highly structured collaboration strategy, comparable to what in studies from U.K. and Australia has denoted as private finance initiative. This strategy is associated with balance sheet considerations, as it essentially assists governments with gaining access to capital or resources without direct lending.

In contrast, strategic partnerships are less contract-oriented and focuses more on open-ended collaboration based on trust and mutual benefits. “From a theoretical perspective, strategic partnering provides a means of reducing the transaction costs of service specification, supplier procurement, and regulation that can arise under contracting-out” (Skelcher, 2007:358). Donahue & Zeckhauser (2011) find this collaboration strategy to be attentive to divergent preferences of how resources are to be spent. As this strategy allows for the sharing of both production and preference discretion it is especially associated with risk sharing motivations of governments. It should also be noted that preference discretion is likely to play a dominant role when collaborating with nonprofit actors, as these tend to have strong interest in particular goals and causes.

Efficiency

Efficiency arguments are not uniform, but a collection of arguments. What all these arguments have in common is the conviction that the private sector may have cost advantages or other strongholds that enable better outcomes. The motivation for public-private collaboration is that external agents have productive capacities that government lacks. Thus “by collaborating with firms or nonprofit organizations, government can tap into efficiency edge to improve performance or lower costs or both, relative to acting alone” (Donahue & Zeckhauser, 2008:506).

The most fundamental principle to this rational is the notion of profit and ownership. Collaborating with a private actor ensures efficiency because the wealth of the owner is tied to profits of the corporation. This is a contrast to most bureaucracy performance metrics, which are far more complicated and multidimensional. More so, ownership of governments cannot be transferred if citizens disapprove with the level of efficiency, in contrast to the private sector, where ownership is a good that can be traded (Donahue, 1989). In line with this argument, the private sector may be able to outperform the public due to “the ability to harvest economies of scale and scope by operating beyond jurisdictional boundaries, and the prospect that the quality of performance will affect the odds of expansion, merger, or extinction” (Donahue & Zeckhauser, 2008:506).

In infrastructure projects with longer time horizon, the whole-of-life cost argument may motivate governments. Better outcome will arguably arise if private actors stay involved. This will create the right incentive structures in the construction phase, where it will be less likely that a private contractor will build a poorly designed or constructed facility, as the same private actor will continue to be responsible

for it (Greve, 2010). This argument of lower whole-life-cost has also been related to the rational of value-for-money, which is assumed to flow from the greater operating efficiency of the private sector. These could be achieved as a result of several factors, including market forces that encourage efficiency and good contract management. The value-for-money rational does also include potential efficiency gains, such as innovation in technology and risk sharing (Hodge & Greve, 2007).

An additional motivation for governments to engage collaboratively with the private sector is the efficiencies it possibly gains in organizational and procedural flexibility. Hence, not being a bureaucracy can have certain advantages. These include more flexible use of labor, a richer array of penalty options, and less process constraints. This rationale could motivate the public sector to collaborate both with the private sector and nonprofit actors, as this source of efficiency is not necessary bound to the notion of ownership and profits (Donahue, 1989; Donahue & Zeckhauser, 2008).

“Further factors, beyond an economic productivity edge may enable private organizations to produce more output from the same resources. They may have better information about what to be produced” (Donahue & Zeckhauser, 2011:35). In some instances information is so embedded in a private actor that it is hard to provide or transfer to the public sector. Information can consist of vital data or technical know-how that would be too costly or too time consuming to transfer. Coglianese, Zeckhauser & Parson (2004) do in line with this argument find that especially within environmental governance the motivation for governments to interact with the private sector is extensive. This is because governments may need detailed information about operations of private corporations to create effective climate change mitigation solutions. The challenge being, that the incentives for the private sector to collaborate can be very limited in sectors where government intervention is expected to damage profitability. There may also be cases where governments due to other rationales need to bring in a private actor, were the government might suspect that the service it receives is incomplete or distorted. “In such circumstances turning to better informed partners can be a powerful motive for collaboration” (Donahue & Zeckhauser, 2011:104).

The efficiency argument also draws on many well-developed business theories, such as transaction cost economics and competition theory. Nonetheless, evidence that conclusively support the efficiency arguments remain limited, at least in more extensive collaborations, such as infrastructure projects (Hodge & Greve, 2007). Furthermore, the whole-of-life cost motivation can also be contested as “it

seems strange in a way, that long-term planning is associated with the private sector, and the short-term outlook is associated with the public sector” (Greve, 2010:590).

Efficiency - Collaboration strategies

Based on these efficiency motivations three collaboration strategies are found to be associated. These are procurement of contracts, outsourcing and joint venturing.

Procurement of contracts includes a very low degree of shared discretion. Theory suggests this collaboration strategy can be used when governments need a specific and limited service or product in a cost effective manner. Procurement of contracting can also be used to reap the advantages, if efficiency arises due to high economies of scale and scope by private actors operating beyond jurisdictional boundaries. In both cases the key is that government can “harness private efficiency advantages without encountering the complexities that arise with shared discretion” (Donahue & Zeckhauser, 2011:46).

If the government motivation rests on the lack of information, or high degree of embedded information in a private actor, two collaboration strategies are associated. Procurement of contracts may be used if the task is relatively limited, while outsourcing may be used if the task or service is more comprehensive. Similar rationale applies if efficiency arises due to organizational and procedural flexibility (Donahue & Zeckhauser, 2011).

If government motivation is related to whole-life-cost, then more extensive collaboration strategies are suggested by theory. These are either outsourcing or joint venturing, where the latter typically involves some form of financing. Both outsourcing and joint venturing have according to Greve (2010) been used especially in infrastructure projects, where Donahue (1989) focuses on its use in the U.S. energy sector.

Legitimacy

Government endorsement or financial support can be a powerful way for private actors, organizations or stakeholders to gain legitimacy. However, legitimacy may also flow the opposite way, where governments wish to increase legitimacy of their undertakings. Legitimacy can according to Donahue (2002) arise from two sources. “One source is the comparative performance of markets and government; the other is change in the perceived legitimacy (among both élites and the general public) of market-based arrangements. The two are related, of course, as perceptions of relative performance reshape relative legitimacy” (Donahue, 2002:2). On the other hand, Brinkerhoff (2007) categorizes

legitimacy according to three sources. These are either structure - who participates; process - how do they participate; or outcomes – are expectations met.

Structure - who participates, is related to the legitimacy increase of government undertakings from collaborating with either a specific or type of private actor. If this is the case, Donahue & Zeckhauser (2011) refers to this as reputational externality. Motivations to increase legitimacy by the virtue of collaborating with a kind of private actor, is most likely to exist if a particular undertaking is seen as inappropriate for government to pursue on its own (Donahue & Zeckhauser, 2008).

Process - how do actors participate, is more likely to be a government motivation in collective action problems. Here governments wish to move from a no-win situation among private actors to a potential win-win. The motivation can also arise from the need to engage private actors in an open decision making process (Brinkerhoff, 2007).

Outcomes – is expectations met, is more closely related to Donahue's (2002) notion on the two sources of legitimacy, which essentially rests on the perception of efficiency. Both structure and outcome related legitimacy gains have a tendency to be closely linked to the efficiency arguments. This is because the most widespread source of legitimacy is the perception of efficiency. Therefore, legitimacy has a tendency to follow at the trailing edge of efficiency, as it takes time for the perception of efficiency to form (Donahue & Zeckhauser, 2011). Brinkerhoff (2002) broadens the scope beyond efficiency and instead argues that if any organization loses their competitive advantages it will eventually lose its legitimacy. In the most extreme cases where citizens have systematically low approval or esteem for the government "collaboration with the private sector can shore up legitimacy independent of any task-specific factors" (Donahue & Zeckhauser, 2008:507).

All three types are also highly interdependent, as it is suggested that public-private collaborations, which deliver higher public than private benefits, perceived and/or actual benefits, are likely to enjoy greater public support. This will according to Brinkerhoff & Brinkerhoff (2011) translate into higher degrees of legitimacy. As a consequence, legitimacy is always a perception. Therefore, the use of the legitimacy motivation can differ a lot from culture to culture or society to society. "Government activities that might be quite acceptable in one culture or at one time may seem beyond bounds in another time or place" (Donahue & Zeckhauser, 2008:507). Some societies have few hesitations about direct government action, while other societies may favor a combination. In particular the U.S. public opinion is

found to be watchful about the overall size of the government, or its influence in certain policy realms. This perception is not static over time, and can change in the light of new circumstances (Donahue & Zeckhauser, 2011).

Brinkerhoff (2002) also examined which kinds of partners are most likely to provide increased legitimacy to a collaboration. The argument being that while a large set of potential partners can contribute with increased efficiency or financial resources, legitimacy often stems from representing the constituents. This can be an argument for collaborating especially with nonprofit organizations. Donahue (2002) also deals with the notion of which actors may increase legitimacy and accountability in a collaboration. The argument being that the public sector represents extensive accountability, while the private sector can contribute with intensive accountability. Intensive accountability arises due to very specific knowledge in a certain area, which is also their source of legitimacy. The idea being, that the private sector can become a valuable partner to the government, as it can contribute with intensive accountability.

Lastly, the importance of transparency in relation to legitimacy should also be noted as “external legitimacy derives from both internal (among partners) and external transparency. [Where] transparency refers to open processes of reporting, review and decision-making” (Brinkerhoff 2007:76).

Legitimacy - Collaboration strategies

Legitimacy motivation is associated with either outsourcing or collaborative networks.

As previously outlined, outsourcing is often related to the notion of efficiency. As some theoretical arguments concerning legitimacy essentially is based on perceived efficiency gains, the collaboration strategy is similar. Outsourcing can also be a collaboration strategy if legitimacy increases due to the involvement of a private actor, or if the undertaking is perceived to be inappropriate for the government. In these cases private sector delivery of this task can be preferable. The focus on how the private sector can contribute with intensive accountability argues a similar collaboration strategy. Donahue (2002) finds that through the use of market-based governance, it is possible to obtain a better balance of the two styles of accountability. The definition of market-based governance is highly comparable to the broad definition of outsourcing applied in this thesis.

Theory suggests that collaborative networks can increase legitimacy in cases of collective action problems or in the involvement of constituents. The key being that collaborative networks allow for a

range of different actors to provide legitimacy, through their involvement in the network. The level of discretion between the involved actors can vary, nevertheless “central decision makers to an increasing extent view governance networks as an efficient and legitimate mechanism of governance” (Sørensen & Torfing, 2005:198). Brinkerhoff & Brinkerhoff (2011) finds this collaboration strategy to be reflected in the use of highly issue specific networks, cross-sectorial committees, task forces, and commissions.

The degree of legitimacy any collaboration strategy can provide depends on the “precision and tightness of public mandates delegated to market agents” (Donahue 2002:7). With this notion Donahue (2002) highlights the importance of carefully and intelligently crafted collaborations strategies, and how this is particularly important in more extensive forms of collaborations. Also, legitimacy is a matter of degree rather than a question of all or nothing (Sørensen & Torfing, 2005).

Innovation

Governments may also have innovation related motivations to collaborate with the private sector. The arguments typically fall in two categories. The first is highly related to the advantages private actors may have from the ability to apply innovation, either from an efficiency standpoint or because governments lack knowledge on what should be done or how (Donahue & Zeckhauser, 2011). This is often related to product, service or process innovations. The second category of arguments is related to innovations in governance, where the focus is to innovate the structure or processes of government.

In relation to the first category, potential government motivation to collaborate is again greatly associated with the efficiency arguments previously presented. Hence, efficiency arises due to private corporations’ ability to scale their innovations and superior access to information. “For a municipal agency, the potential payoff for innovation is limited to whatever lower cost or higher quality can be achieved within city limits. Except in the bigger cities, it seldom makes sense for public works departments to make large investment in innovation. A private contractor, however, can claim proprietary rights to innovation, defuse new methods throughout its operation and use technical advantages as a competitive edge to expands its markets“ (Donahue, 1989:142).

The motivation may be even stronger if it is impossible or prohibitively costly for governments to acquire the information needed to innovate. Private sector involvement may simply be necessary, even if government's resources are no more constrained and its productivity no lower. An example from

environmental governance is the collaboration with the private sector to develop the cheapest way to reduce pollution from a particular industrial process (Donahue & Zeckhauser, 2008). Donahue (1989) argues that governments have the strongest incentives to collaborate when the government does not care about, or has little understanding of, the means the private actor will employ to reach the goal. If means matter just as much as ends, then the use of technical innovation becomes more complex.

Hartley (2013) finds that the argument of private sector superiority in producing innovations to be highly context dependent, and that the barriers to public sector innovation have been overplayed. Donahue (1999) does in later writings in some aspect agree that there are public sector drivers, which could spur innovation. However, he maintains that governments can be limited in their ability to produce innovation due to the size and complexity of the bureaucracy, the lack of clear missions, weak link between resources and results, or monopoly status. This is in contrast to the private sector, which is “bestirred to innovate by the recognition that stasis means extinction, as rivals race to deliver better results or lower prices. In the nonprofit world as well, innovation is often essential to finding a sustainable niche where unmet needs and willing donors coexist” (Donahue, 1999:6).

The second argument concerning innovation in governance arose to emphasize the enhancement of effectiveness of public policies, service systems, and structures (Hartley, Sørensen & Torfing, 2013). As innovation in governance can be motivated by the need for greater public or user participation, it can be related to legitimacy motivation. The motive may also be to innovate ways in which productive activity is financed and subsequently resource motivations may be interconnected (Moore and Hartley, 2008).

In any case, governments must accept that “innovation, by definition, is uncertain in both process and outcome. It is new and it is discontinuous with previous products, processes and/or services, so there is a risk that it will fail” (Hartley, 2013:53).

Innovation - Collaboration strategies

Innovation motivation is associated with two collaboration strategies. These are procurement of innovation and collaborative networks.

Procurement of innovation is a specific procurement strategy, which is to enable innovation. It is a collaboration strategy that refers to contracting practices that attempts to enable innovation possibilities without necessarily targeting new products. As previously noted, procurement is well suited when

efficiency advantages of the private sector is the government motivation to collaborate. Procurement of innovation is no exception. In cases where governments lack information or the understanding of the means to reach specific goal, procurement of innovation can be obtained by a “public agency publishing some kind of opportunity without either specifying a problem nor making a commitment to procure anything. It is the task of the supplier to explore and exploit the opportunity” (Rolfstam, 2012:8). Donahue & Zeckhauser (2011) find that procurement of innovation in this regard allows for a high degree of production discretion. A useful strategy when a government does not precisely know what it needs.

If government motivation is related to innovation in governance, theory suggests the use of collaborative networks. Hartley, Sørensen & Torfing (2013) argue that innovation in governance is most likely to arise through collaboration with different sectors, public authorities, private corporations and nonprofit organization. Collaborative networks enable partners to find innovative solutions to complex problems and learning through inter-organizational interaction (Hartley, Sørensen & Torfing, 2013). This is because innovation arguably often is a result of interaction between actors from different levels and organizations. More so “the definition and framing of complex problems is often improved when actors with different experiences and perspectives and forms of knowledge are brought together” (Hartley, Sørensen & Torfing, 2013:826).

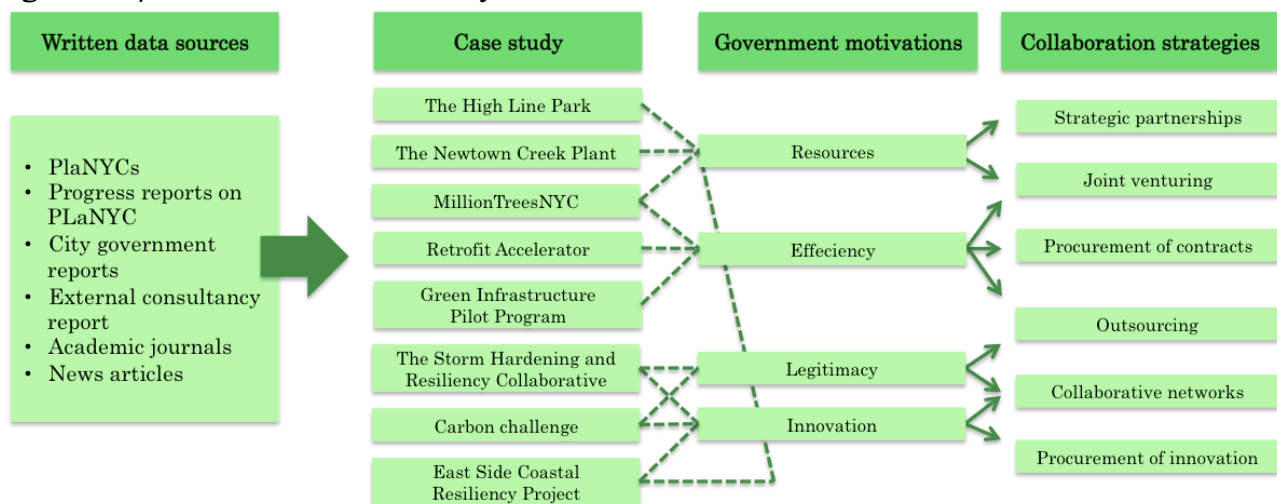
Data and Operationalization

Easton (2010) finds that critical realist case research is essentially eclectic with respect to the kinds of data that may be used. The choice will be governed by what is thought to be required to establish a plausible causal effect, constrained by what data can actually be collected in the research context.

A central primary source for the case study is the actual PlaNYCs and the yearly progress reports. The latter describes the implementation of different initiatives of PlaNYC, tracks their development and indirectly touches upon the collaboration strategies used. To the degree possible complementary reports, information and publications published by the New York City government will be used during the analysis for factual information. It must be noted that these types of information may be skewed or focus only on the most successful cases or aspects of any initiative. Secondary sources such as academic journals, books, and new articles also constitute key inputs to the analysis. These are used, as the analysis aims to include a wide variety of knowledge related to New York City, public-private collaboration and climate change planning by cities. It has been necessary to use already processed

sources of information, the consequence being that knowledge throughout the analysis is neither value neutral nor purely objective accounts. The shortcoming in information is also a consequence of the lack of academic writings on the specific topic of this thesis. Records directly stating government motivations are limited, so insights will be obtained through publications by New York City, academic writing, and news reports. Again such sources can be highly subjective and limited in scope, which can be a significant obstacle in properly establishing the causal effect this thesis takes its offset in. Collaboration strategies are in many cases more easily observable, but the contract specificities and the precise share of discretion among the partners is not publicly available. Obtaining such information would have enabled this thesis to more clearly identify trends and the influence of novel collaboration issues.

Figure 3: Operationalization of the Analysis



The above operationalization figure illustrates the operationalization of the analysis. Based on the four theoretical hypotheses, outlining government motivations and associated collaboration strategies, a theoretical framework is now in place. The New York City case will be analyzed as the empirical case study to investigate, if this theoretical framework is relevant and can explain the collaboration strategies used, even though it is applied to a new policy realm.

PlaNYC consists of hundreds of initiatives and government action points, and analyzing them all is not feasible. The latest progress report alone reported on 257 resiliency initiatives and 132 sustainability initiatives (New York City, 2014b). The thesis will instead focus on eight specific flagship initiatives within four specific climate change sectors included in the PlaNYC, two initiatives from each sector. These sectors are parks and green areas; emission reductions and retrofits; flood protection and resiliency; and

water and pollution control. The specific initiatives are selected based on criteria similar to those used to select New York City in the first place. Hence, the initiatives reflect that New York City is at the forefront of climate change action and the initiatives include temporal variation. Highly profiled initiatives are also chosen due to the better availability of sources concerning these initiatives. More so, they also exemplify the comprehensiveness and diversity of PlaNYC. The logic of retroduction also allowed an iterative analytical process, here reflected in the ability to select initiatives that include public-private collaboration.

Each initiative and the development of the collaboration strategy will be chronologically traced through the various PlaNYCs and sector specific reports. Within each initiative, based on the best available data, the analysis will outline the goal of the initiative, government motivation for collaborating with the private sector and the collaboration strategy used to implement the initiative. Selecting only eight climate action initiatives also implies that a lot of initiatives that potentially would have had different outcomes are left out. Selecting another set of initiatives could potentially have found weaker or stronger causal effects or different trends than this analysis does. Awareness about this fact will also be reflected in the conclusion and notions related to analytic generalization.

CHAPTER 4: ANALYSIS

Climate Change Planning by Cities

Climate change as a policy realm is relatively new compared to many other. By the late 1970's the first nonprofit organizations started to raise the issue of global warming, and throughout the 1980's the scientific community grew increasingly aware of the potential effects of climate change. It was not until 1988, with the establishment of the International Panel on Climate Change, that tangible international attention was devoted to this agenda. In the following years 166 nations signed the United Nations Framework Convention on Climate Change, which encouraged countries to limit their greenhouse gas emissions (United Nations, 2016). The third meeting by the Conference of Parties, COP3, in 1997 resulted in the Kyoto Protocol that became the first major binding piece of international policy by establishing country emissions targets for 2008-2012. The U.S. never ratified the agreement and international negotiations on emission targets beyond 2012 have been at a deadlock until COP21 in December 2015, where a new agreement was reached (United Nations, 2016). COP21 was by Dasgupta (2015) also found to be a turning point for the official recognition of cities in climate changes, where 400 mayors from all over the world participated. During COP21 it was subsequently agreed that in future U.N negotiations, cities would be recognized formally. More so, the mayors signed an agreement on initiatives to reduce urban emissions and to increase the focus on closing the financing gap.

This is the outcome of a decade long development where cities continuously have moved into environmental governance and climate change planning. Bulkeley & Betsill (2013) find that the development has taken place in two overall phases. The first phase can be termed one of municipal voluntarism. This phase involved predominantly small and medium-sized cities in North America and Europe. Influential mayors who recognized the potential significance of climate change characterized this phase. The second phase, starting around 2000, city governments were approaching environmental governance based on strategic urbanism, where climate change became fundamental to the pursuit of wider urban agendas. "In seeking to roll-out comprehensive approaches to addressing climate change across urban communities, municipal governments sought to re-frame climate change as an issue through which other significant local agendas – air pollution, health, congestion, energy security and so on" (Bulkeley & Betsill, 2013:139). This political shift was notable in the U.S. where the growing inflexibility of the federal government spurred more progressive action by cities. It is also during this

second phase, developments in New York City start to materialize under mayor Michael Bloomberg. The emergence of climate change as a strategic issue has also been referred to as 'politics for secure urbanism and resilient infrastructure'. Global cities, including London, New York City, Los Angeles, and Mexico City, now associate climate change with explicit references to enhancing security, and independence, while reducing the cost of energy (Bulkeley & Betsill, 2013).

In the wake of this second phase Bulkeley (2015) also notes another growing trend. A new set of international municipal networks concerned with climate change planning arises. These include C40, the Rockefeller Foundation Resilient Cities and the Clinton Climate Initiative. The opportunities that networks provide for accessing resources, sharing knowledge, and exhibiting political leadership are critical in the work of city governments. The multilevel governance approach has in this regard been proposed as to consider the horizontal city-to-city influences on climate action, while also considering the vertical influences of state-to-local. Based on the previously mentioned statistical study of climate change initiatives in large U.S. cities, the conclusion is that "in spite of the potential for an increased role of federal and state governments in climate action in the United States, city-to-city networks are likely to remain important in motivating cities to mitigate climate change" (Lee & Koski, 2015:1501). The study by Exter, Lenhart & Kern (2015) which analyses 25 Dutch cities, points to another set of recent trends, namely decentralization within city government, externalization of climate initiatives and regionalization.

The issue of authority has also been dealt with in a string of studies, some also including evidence from New York City. Jones (2013) analyzes Vancouver, Melbourne and New York City and concludes that effective climate change action in federal systems requires coordination between all levels of government. More so, a policy gap continues to impede effective policy implementation, with city government being severely limited without the support of other levels of government. Rozenzweig & Solecki (2001) did already in the early 2000's recognize these complexities. In their study of climate change response in New York metropolitan area, they find that fragmented jurisdiction is a challenge. The second barrier they identify is the reactive nature of management in key city and state agencies. Other studies have looked even more into this notion of what shape the implementation of climate change policies. The conclusion being that key explanatory mechanisms include 1) the presence of a committed individual with institutional support; 2) the availability of funding; 3) the extent of local powers over transport, energy, and planning; 4) how climate change is framed in relation to economic objectives; and 5) the political will to act (Betsill & Bulkeley, 2005).

A few studies have focused on issues related to the involvement of the private sector and nonprofit organizations. Bäckstrand (2008) studies the landscape of transnational climate partnerships. She develops a framework of climate partnerships along four functional dimensions. Advocacy, rule and standard setting, rule implementation, and service provision. Freedman Consulting (2013) conceptualizes public-private collaboration in climate change planning according to functional categories. These are private partners that are funders or in-kind supporter, private partner as assisting or facilitating implementation, and private partners as an intermediary between government and another party. Another complementary analysis argues that “rather than identifying shifts in authority between state and non-state actors, these cases suggest that what is occurring in the urban governance of climate change is the constitution of new forms of public and private authority” (Bulkeley & Schroeder, 2011:762). This study further contributes to the motivation debate, and finds that identities, interests, and capacities of actors in climate change planning are not strictly based on institutional location or fixed in space and time. Rather, motivations are produced through the contested development of projects and programs.

The History of PlaNYC

Every four years, New York City puts forward a comprehensive plan for the development of the city, called PlaNYC. The specific policy areas covered have continuously been increasing, so the latest plan include workforce development, housing, infrastructure, social services, criminal justice, sustainability, water, waste and resiliency initiatives (New York City, 2015a).



2007 PlaNYC

Introduction in appendix 1



2011 PlaNYC

Introduction in appendix 2



2013 PlaNYC

Introduction in appendix 3



2015 PlaNYC

Introduction in appendix 4

The first plan was released in 2007 under the stewardship of mayor Michael Bloomberg. Sustainability was already a watchword, but despite a series of reports warning about climate risks, the city government had not shown much inclination to take action. New York City faced major challenges in terms of aging infrastructure and a fast growing population, so sustainability initiatives initiated to

balance the rapid growth, while preserving the environment and livability of the city. The plan was in many ways a land-use strategy, but it also included policy areas such as economic growth, health and housing (Bageley & Gallucci, 2013). With this plan the city government set out to reduce emissions by 30% by 2030. As 75% of emissions stem from buildings, efforts were primarily focused on reducing the energy use but also waste, transport and renewables were incorporated (New York City, 2007).

The 2011 PlaNYC was an updated version of the 2007 plan. Priorities and goals essentially remained the same and initiatives still primarily evolved around assessing how to reach the 30% emission reduction target. Funding for adaptation and mitigation actions also remained limited (New York City, 2011). Nonetheless, the two first PlaNYC's laid a solid foundation to "an aggressive climate change action plan that would transform New York City and the mayor into world leaders on global warming at a time when many U.S. politicians were doing their best to avoid the controversial topic" (Bageley & Gallucci, 2013:1).

The major turning point, which spurred New York City to launch a full-fledged climate change plan, was Hurricane Sandy, which hit the city late October 2012. This event made climate change very tangible to New Yorkers. 43 people lost their lives and "while Sandy caused about \$19 billion in losses for our city, rising sea levels and ocean temperatures mean that by the 2050s, a storm like Sandy could cause an estimated \$90 billion in losses — almost five times as much" (New York City, 2013a:1).

The response of mayor Michael Bloomberg was to make an extraordinary update of the PlaNYC, published in mid 2013. This time the focus was solely on how to create a sustainable and resilient city, including both initiatives on climate change adaptation and mitigation. This plan also came with a massive investment budget. \$20 billion dollars dedicated to the implementation of the plan and its 257 specific initiatives. Each initiative was assigned to a lead implementing agency, dedicated funding was set out and followed up by milestone tracking (New York City, 2013a). The initiatives ranged from complex to straight forward, and while some included city, state or federal law changes, others were deeply dependent on private sector collaboration. Some required massive construction projects while others could be implemented quickly. The sum of it being, that implementation will take more than 10 years and include an unprecedented number of stakeholders. "The plan to build a stronger resilient New York set a new global standard for long-term resilience planning with its focus on future risks from climate change and its comprehensive approach" (Bullock, Haddow, Haddow, & Coppola, 2015:237).

In the spring of 2015 it was four years since the last ordinary PlaNYC was published, and for the first

time a PlaNYC was to be prepared under a new city government and mayor Bill de Blasio. Mayor Bill de Blasio had earlier that year announced that New York City, as the largest city in the world, would commit to reduce greenhouse gas emissions by 80% by 2050. The 2015 PlaNYC carried forward all the sustainability and resiliency initiatives from the 2013 plan, but increased the level of ambition and the sectors included, in order to reach the new reduction target. The biggest change in the 2015 PlaNYC was mayor Bill de Blasio's promise to create a more inclusive, equitable economy and lift 800,000 New Yorkers out of poverty (New York City, 2015a).

Parks and Green Areas

This section will analyze the collaboration strategies used by city government of New York City in relation to park development, maintenance and increasing the number of trees in the city. As the New York City government is responsible for some 600 parks spread throughout the city, the scope of the analysis will be limited to the development of the High Line Park and the MillionTreesNYC initiative.

In the late 1980's and 1990's, the New York City Department of Parks and Recreation was challenged by budget cuts and growing crime rates in the public parks. More so, "the parks were seen as a second-order public function, and the parks department suffered from the view that its mission was discretionary" (Donahue & Zeckhauser, 2011:159). To solve this problem the parks department tried a strategy of load-shedding, which in essence implied shifting functions away from the parks department towards either other city agencies or not doing certain tasks. Although this arguably offered some relief to the department, it did not solve the problem, which was too few resources. This spurred the interest of the city government to collaborate with the private sector and enlist private involvement in park upgrades, maintenance, and management (Donahue & Zeckhauser, 2011).

The first park the city government focused on was Central Park, the reason being that Central Park already was subject to private interest. Based on a number of smaller volunteer groups the Central Park Conservancy arose in the 1990's. Even though this nonprofit organization initially just provided maps over the park to tourists and held small-scale art and music events in the park, it grew in size. Employees from the parks department started cultivating relationships with potential donors, like the Central Park Conservancy and identify grant opportunities (Donahue & Zeckhauser, 2008). By "early 1990's, partnerships with the private sector - for capital investments, for volunteer labor, for contracted services for political support - had matured from an improbable experiment into a strategic mainstay for the

parks department” (Donahue & Zeckhauser, 2011:161). The result was, that with time the parks department initiated a collaboration strategy with the Central Park Conservancy, based on load-sharing. In its initial phases the collaboration only included fundraising and volunteer laboring.

As the actual resource contribution by the Central Park Conservancy to the park rose, a misalignment of discretion surfaced. New York City government therefore agreed to shift discretion and the organization was given formal responsibility for managing Central Park in the late 1990’s (Donahue & Zeckhauser, 2008). The written agreement between the parks department and Central Park Conservancy resembles a conventional outsourcing agreement with budget approval mechanisms, rules on subcontracting, park functions, and maintenance and repair agreements. The more extensive collaborative component lies in the fact that the Central Park Conservancy was given a high degree of autonomy over how to carry out the tasks and how to develop the park. The parks department trusted the Central Park Conservancy in having similar goals as the city government, and preference disagreements were expected to be minimal. The agreement and the nonprofit nature of the Central Park Conservancy also limited conflicts of payoff discretion (Donahue & Zeckhauser, 2011). The collaboration strategy implemented therefore resembles a mix of outsourcing and strategic partnerships.

Collaboration with ‘friends of the park’ organizations came in place before the first PlaNYC, but this collaboration strategy has been carried forth in these plans as well. In general this approach has become a “wide network of innovative partnerships that has brought countless volunteers, much needed resources, and shared advocacy for the city’s green spaces” (New York City, 2013a:192). Some changes in the use of this collaboration strategy may be expected after the change of mayor in 2014. The new city government focuses on the problem of developing parks in the poorer parts of the city. Many of the collaborations established since the late 1990’s were related to parks in central New York City, where nonprofit organizations is often driven by highly privileged New Yorkers. To exemplify, Michael Bloomberg is the former trustee of the Central Park Conservancy (Donahue & Zeckhauser, 2011). This new goal may imply that the rate of new collaborations may be limited. Because as Donahue & Zeckhauser (2011) note the private sector is likely to want influence over how the money is spent.

Initiative: The High Line Park

When the first PlaNYC was publicized in 2007 one of the most tangible goals set forward was the promise that by 2030 every New Yorker should have no more than a ten minutes walk to a park. During

the first four years, city government managed to give 250,000 more this possibility, primarily by transforming schoolyards into open green playgrounds. Another important initiative to obtain this goal in the Western part of lower Manhattan is the creation of the High Line Park (New York City, 2011). The initiative was originally pushed by a community group, which did not want the old elevated railway to be torn down, which makes up the park today. The city government did in this regard have a clearly defined goal, but the specifics of the initiative, how the parks should look and function, was not determined.

This was a challenge, as the city government had very few budgetary resources to allocate to the initiative, including staff hours to maintain it and develop it. Government motivation to collaborate was therefore the need to raise resources both for the construction of the park and the maintenance. As before, the city government chose a collaboration strategy, where city could “continue to build on its long history of working with nonprofit organizations, volunteer organizations, and ‘friends of parks’ groups” (New York City, 2011:47). The development of the High Line Park followed this model as well, with a collaboration strategy similar to the Central Park model.

In the case of the High Line Park the leading nonprofit organization is called Friends of the High Line. In line with the Central Park model, the city also agreed with Friends of the High Line to be responsible for the maintenance of the park. Responsibility is delegated to the Friends of the High Line through a license agreement with the parks department, where the nonprofit organization is responsible for the everyday maintenance. More so, this nonprofit became very involved in the capital provision and the construction of the park, and was given a large degree of autonomy in terms of maintenance. The total projected annual maintenance cost is \$3.5-4.5 million, of which Friends of the High Line is responsible for over 70%. The city government is still responsible for providing security in the High Line Park, as well as maintaining the High Line Park railway structure and elevators (Friends of the High Line, 2016).

Table 2: High Line Park Construction Funding

Funding
\$123.2 million from the City
\$20.3 million from the Federal Government
\$400,000 from the State
Remaining funds will be raised privately by Friends of the High Line and Neighboring Developers
To date, Friends of the High Line have raised \$44 million

(Friends of the High Line, 2016)

It was proposed to raise some of these funds by creating a business improvement district, authorized to collect special levies from businesses surrounding the High Line Park, as is the case with Bryant Park. Mayor Michael Bloomberg declared such approach to be essential, however, there has not been support to create a business improvement district around the High Line Park, now eight years after it was proposed (Donahue & Zeckhauser, 2008 and Friends of the High Line, 2016).

In combination, this analysis suggests that the collaboration strategy used mostly resemble strategic partnerships. The creation of a business improvement district would have been a move away from the strategic partnership, as a strategic partnership is more trust based than contract oriented. The current collaboration strategy continues to enable the city and the Friends of the High Line to be attentive to preference discretion and divergent preferences of how resources are to be spent. More so, the private partner has been, and continues to be, very involved in both defining the specifics of the goal and the means with which to get there.

Initiative: MillionTreesNYC

The second flagship initiative launched in October 2007 is the MillionTreesNYC initiative, which sets out to plant one million new trees all around New York City within 10 years. The goal being to both make the city greener and to improve air quality in parts of the city with high asthma hospitalization rates for children (New York City, 2011). Increased livability, sustainability, and higher property values have also been mentioned as drivers of this initiative (MillionTreesNYC, 2016).

The goal of the initiative was clearly defined from the initiation, plant one million trees in New York City. The city government had also from the offset determined how the implementation of the initiative should take place. The city government would plant 70% of trees in parks and other public spaces and carry those costs, whereas the other 30% should be planted at private properties with funding coming from both the public and private sector, homeowners, community organizations and nonprofit organization. The advantages of involving the private sector was that this approach provided access to potential planting sites beyond parks and public land, such as university campuses, schools, hospitals, and low-income housing. The big innovation was the ability to take on the whole landscape beyond the traditional jurisdiction of the parks department. But the city government needed to engage the private stakeholders in order for 30% of trees to be planted on private land.

In the same fashion as with the High Line Park, the city government needed funding to reach this goal, as this initiative fell under the financially constrained parks department. Hence, resource motivation spurred the government to engage with the private sector. More so, the city government needed flexibility within the implementation of large and longstanding initiatives, like MillionTreesNYC, but without outsourcing the entire operations. Donahue & Zeckhauser (2008) suggest private actors can bring efficiency advantages, based on organizational and procedural flexibility. These include more flexible use of labor and less process constraints, both highly relevant also to the MillionTreesNYC initiative. This suggests that efficiency aspects also likely have been a motive for the city government.

On the basis of this dual motivation, the city government initiated a collaboration strategy that would include finding a primary nonprofit partner to be in charge and manage outreach activities and the private sector engagement. The New York Restoration Project was chosen, as this organization had also been involved in advocating for the initiative. The activities the New York Restoration Project took on during the implementation of the initiative included employee volunteer planting days, fundraising, greening strategies, business improvement district events, and education. New York City allocated \$400 million to the project and the private campaign raised over \$25 million. Lead funders include Rockefeller Foundation, Bloomberg Philanthropies, Toyota, Con Edison, Home Depot Foundation, BNP Paribas, and TD Bank (Freedman Consulting, 2013). As noted by Freedman Consulting (2013) what arose was a shared ownership of the initiative, which implied that the private sector stay involved and are responsible for maintenance of the trees planted on private property.

This analysis finds the collaboration strategy to most closely resemble joint venturing, due to the key role given to a private partner to coordinate and run the initiative, but without outsourcing it. More so, the many other participating partners beyond the New York Restoration Project and their role both as financing and maintained partners also support the notion of joint venturing. However, there is no payback of investments as would often be the case. This is the key feature that suggests elements of strategic partnerships to be mixed with the joint venturing. The clear strategic element of the collaboration is also highlighted by the fact that “the parks department and New York Restoration Project have established an advisory committee to contribute to the strategic direction and implementation of the MillionTreesNYC initiative” (MillionTreesNYC, 2016:1).

The MillionTreesNYC initiative has gained a lot of attention, as it was very successful in obtaining its primary goal. By 2011 430,000 trees were planted, that number rose to 650,00 by 2013. In 2014 830,000 trees had been planted and by late 2015 the city reached its goal of 1 million new trees, two years ahead of schedule (New York City, 2013b and New York City, 2014b).

Emission Reductions and Retrofits

One of the most ambitious goals set out by PlaNYC is the 80% reduction in greenhouse gas emissions by 2050. New York City is the biggest city in the world to commit to this goal. As approximately 75% of emissions stem from buildings' energy use, this sector has received considerable attention since the start of PlaNYC (New York City, 2015a). In 2007 the goal was a 30% reduction by 2030, where the strategy was to create an intergovernmental task force, develop neighborhood specific plans and citywide climate initiatives (New York City, 2007). The following year the interagency Climate Change Adaptation Taskforce was launched to coordinate citywide planning initiatives. In addition, an advisory board was established with experts from both local and national organizations and representatives from the private sector and real estate groups. According to an evaluation report done by Local Governments for Sustainability (2010) this board was created because the city government recognized that it needed the knowledge that private sector held to implement PlaNYC.

One of the more far reaching initiatives introduced, was the Greener, Greater Buildings Plan whereby the city government in 2009 took a considerable step beyond planning. This initiative is “the most comprehensive set of energy efficiency laws in the U.S., targeting New York City’s largest existing buildings, which constitute half of its built square footage and 45% of citywide energy use” (New York City, 2016a:1). For these buildings, the 2009 laws require annual benchmarking of energy with public disclosure, an audit and retro-commissioning every ten years, and the installation of sub-meters. The goal of the city government is to increase awareness about energy use, which to this date is the principal approach chosen by New York City to increase energy efficiency in buildings. This implies that the city to a high degree must depend on volunteerism. In 2014, New York City stated that instead of making more stringent laws the city government will pave the way by setting the example with city-owned buildings, act as first adopter of new technology and encourage early movers in the private sector to do the same. In tandem the city will collaborate with building owners, managers and real estate developers, who are already undertaking innovative projects. This is to support market adoption of innovative

strategies and technologies by ensuring that the most promising technologies are able to come to market quickly and can be scaled up citywide with limited red tape (New York City, 2014a).

In essence the motivation for New York City to collaborate with the private sector, is its lack of political will to make new command-and-control regulation forcing the private sector to increase energy efficiency. The flagship initiatives analyzed in the rest of this subsection, are two of the subsequent efforts to reduce energy use in the one million privately owned buildings in New York City.

Initiative: The Carbon Challenge

The Carbon Challenge is a voluntary carbon reduction program for universities, hospitals, commercial offices, and multi-family buildings to reduce emissions by 30% in 10 years. Participants do not receive incentive payments or compensation, instead the driver is to save money on the energy bill (New York City, 2015a). The Carbon Challenge was launched with the first PlaNYC in 2007, where the city decided not only to reduce total emissions by 30% by 2030, but that city-owned buildings should lead the way and achieve this reduction in only 10 years.

The initiative began in 2008 with mayor Michael Bloomberg inviting universities in New York City to follow in the footsteps of the city government, and commit to reducing emissions by 30% before 2017. 14 universities accepted the challenge, which started to create greenhouse gas emissions inventories and action plans for retrofitting buildings and greening operations. “The universities own significant real estate portfolios in New York City, and through their efforts the city will be able to make major gains towards achieving its overall 30% reduction by 2030 for the community as a whole” (Local Governments for Sustainability, 2010:43). The Carbon Challenge was quickly expanded to also include hospitals and by 2011 29 institutions had accepted the Carbon Challenge. Due to the success of the Carbon Challenge it was in the following years further expanded to also include theaters and commercial offices (New York City, 2011). By 2013, five of the original 29 institutions had already reached the goal of 30% reduction, five years ahead of schedule. A few universities already at this point increased their goal to 50% reductions by 2017. The Carbon Challenge is still developing and New York City (2015c) recently announced that 700 multifamily residential buildings are joining the challenge. Hence, the outreach of the Carbon Challenge is still increasing, and with 12 institutions expanding their commitment to a 50% reduction by 2025 the ambitions continue to grow (New York City, 2015b).

The government motivation to collaborate with the private sector in this fashion is found to be dual. Firstly, the government needs legitimacy to keep pushing the agenda of energy efficiency onto the private sector. Throughout various reports the city government stresses how the Carbon Challenge creates this voluntary buy-in and behavioral changes. It can therefore be argued that New York City is attempting to make energy efficiency a legitimate arena for city government interference, by proving how some of the biggest and most respected industry leaders have accepted this initiative. New York City (2015b) furthermore published a Carbon Challenge handbook for universities and hospitals. This highlights how other benefits such as energy cost savings, energy reliability, and improved local air quality are just as important as the emission reduction. This resembles the notion of outcome legitimacy by Brinkerhoff (2007) where increased legitimacy is based on efficient outcomes of the collaboration.

The second government motivation is arguably innovation needs. The government stresses how there is a need for private building owners to be part of the testing of new technologies and developing novel approaches to increase energy efficiency. The focus on innovation is also highlighted by the fact that participating institutions were to exchange best practice and ideas (Local Governments for Sustainability, 2010). The Carbon Challenge is also built on the notion of mutual benefits of innovations, as the New York City government argues this is an opportunity for universities to align their academic research and environmental stewardship efforts with the broader citywide sustainability goals of PlaNYC. For hospitals, the Carbon Challenge is a way to innovatively reduce air pollution, which is an important component of their general mission to improve public health (New York City, 2013c).

The collaboration strategy used by the city government is closely associated with collaborative networks. This is because the key component of the collaboration strategy is to bring together the most ambitious private stakeholders to develop best practices. The city government also highlights how this collaboration strategy has created a “platform for sustainability professionals and facilities managers across institutions to measure their progress and learn from others’ experiences. The Challenge helps to expedite this learning curve by providing tools such as a carbon emissions calculator to measure emissions and a climate action plan template to help participants develop their emissions reduction strategy” (New York City, 2013c:8) In addition, the Carbon Challenge has created a community of private actors that help each other navigate the complex array of energy-saving opportunities and financial incentives. Regular meetings in which participating institutions can share results have also

created friendly competition. Hence, notions of both collaborative networks, that can provide learning and innovation is key in this initiative and the subsequent collaboration strategy (New York City, 2013c).

This strategy also fits nicely with the notions of innovation by Hartley, Sørensen & Torfing (2013) who suggest that innovation is best obtained by network governance, which emphasizes the role of collaborative networks in finding innovative solutions to complex problems and learning through inter-organizational interaction. Brinkerhoff (2007) also suggested collaborative networks to be an associated collaboration strategy when motivated by legitimacy considerations.

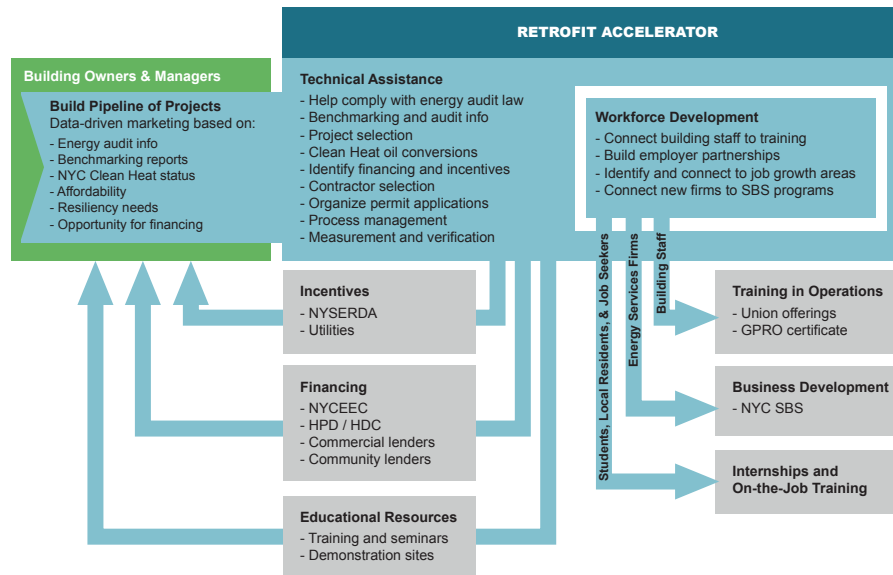
Initiative: Retrofit Accelerator

The second flagship initiative is the Retrofit Accelerator, which is a more recent initiative. The goal with this initiative does in many ways resemble that of the Carbon Challenge, but with this initiative the city government attempts to also involve smaller private building owners and the commercial offices that are too small to be covered by the Greener Greater Buildings Plan. The Retrofit Accelerator is a free program where a team of customer service and building experts provides technical assistance to building owners in New York City. This is to assist owners with determining which energy efficiency retrofits are the most effective, help with selecting a contractor, assist with paperwork to permit the project, connect the owner to available financing sources, and finally measure and verify energy efficiency results (Retrofit Accelerator, 2016). Hence, an initiative that provides a one-stop-shop that aims to accelerate the market transformation begun by the Greener, Greater Buildings Plan and to further spur private investment (New York City, 2015c).

The city government is aware that it will not reach its emission reduction goal by 2050 unless smaller private building owners are willing to also engage in this agenda. Even though the agenda has become more legitimate and best practices are available, based on for instance the Carbon Challenge, the transformation is happening too slow (New York City, 2014a). Consequently, government motivation to collaborate with the private sector is closely related to efficiency gains and the lack of information on the government's part. This efficiency motivation is reflected in the characterization of problem, where the city government concludes that "many decision-makers still face a range of obstacles to pursuing building upgrades, including limited financial and human capital, difficulty navigating available financing and incentive programs, and the complexities of undertaking energy and water efficiency upgrades" (New York City, 2014a:58). As with the Carbon Challenge, New York City (2014a) is keen to highlight the

notion of mutual benefits, where New York City benefits from lowering emissions and building owners reducing energy usage, operating costs, and thereby creating affordable rents

Figure 4: Intended Functioning of the Retrofit Accelerator



(New York City, 2014a:58)

In contrast to the Carbon Challenge, the city does with the Retrofit Accelerator provide more tangible knowledge resources to private building owners. The city uses contract based private-public collaboration to deliver these knowledge resources. In the procurement material the city sought consultants of high quality, who had demonstrated successful experience in performing services similar to those encompassed in the contract, and who at the same time could provide the lowest cost (New York City, 2015d). Based on a this procurement process a consortium of three energy efficiency consultancy firms won the service contract for the Retrofit Accelerator in late September 2015. A key component in the collaboration strategy is also to collaborate with the private sector to provide the knowledge center functions. To ensure unbiased advice about contractors, materials and technology, the city government chose to make Building Energy Exchange the physical resource center for this initiative. Building Energy Exchange is a nonprofit organization that aims to promote energy efficiency to various decision-makers and residents in New York City. This nonprofit organization is sponsored by the New York State, the city government, real estate and energy-consulting firms (Retrofit Accelerator, 2016).

In line with the efficiency argument by Donahue (1989) the city government pursued a collaboration strategy based on procurement of contracts to deliver this service most effectively, possibly also because the expertise needed did not exist within the government. Bringing the nonprofit organization

on board implies a slight diversion away from strictly procurement of contracts, towards strategic partnerships. This is because the role of the Building Energy Exchange is less defined and based on trust not contracts. This thesis still finds this initiative to be primarily implemented through procurement of contracts, but with elements of strategic partnerships. This public-private collaboration is still in its early phases, so the results of this initiative are still to be seen, and to what degree contracting it out will provide the expected efficiency gains.

The expected outcomes of this initiative are to spur investments in 20,000 buildings and 400,000 residential apartment units, representing almost 15% of the city's total built space within 10 years. Under the new city government, employment effects are also measured. This initiative alone is calculated to stimulate roughly \$100 million in annual construction activity and creating more than 400 construction-related jobs (Retrofit Accelerator, 2016). Over all New York City has to date managed to lower its total emissions by 19% and with almost 35 years to go, the city is on the right path (New York City, 2015a).

Flood Protection and Resiliency

PlaNYC, and most noticeable the 2013 revision, is highly focused on flood protection, as this is one of the most eminent sustainability challenges facing New York City. The issue was already on the agenda in 2011, where New York City committed to identify and evaluate citywide coastal protective measures and reduce exposure to coastal storms and flooding. Initiatives included updating codes and standards, working with regional infrastructure operators to implement resilience strategies, and collaborating with the insurance industry to promote flood protection (New York City, 2011). The speed of adaption changed drastically in the wake of Hurricane Sandy, which hit New York City in October 2012. As a consequence the scale of projects also increased, partly due to the influx of money to the city from federal disaster relief funds. Hurricane Sandy flooded large parts of the city, roads, subway stations, and electrical facilities, paralyzing transportation networks and causing power outages. 43 people died and the storm caused at least \$19 billion in damages (New York City, 2013a).

Hurricane Sandy was a challenge to almost every type of public service system and infrastructure within the city. Waterfront defense structures were insufficient and many were destroyed during the storm leaving some of the most populous parts of the city vulnerable. Building damage from Hurricane Sandy was widespread and severe, and the lack of adequate flood insurance left many citizens without means to rebuild their homes. Neighborhoods were without electricity for weeks, the wastewater system was

overburdened, and untreated water was released into the rivers. The PlaNYC from 2013, with an estimated price tag of \$20 billion, set out tackle these major issues (New York City, 2013a).

This subsection will analyze two of the flagship initiatives that arose in the wake of Hurricane Sandy. This is the Storm Hardening and Resiliency Collaborative, which focus on protecting the electric distribution system and the East Side Coastal Resiliency Project, which is a holistic flood protection initiative.

Initiative: Storm Hardening and Resiliency Collaborative

The electrical distribution system in New York City is owned and operated by the Consolidated Edison Company, better known as Con Edison. This system consists essentially of transmission lines and substations that connect the consumer with the power plants. This is a slight simplification, but in essence New York City has privatized the entire electrical system to a private company, making Con Edison the main electrical utility provider in the city.

The operations are subject to a complex system of federal and state oversight, with the State of New York Public Service Commission being the most powerful legislator. “In the complex relationships among utilities, investors, regulators and consumers, contractual structure that give the right signals and incentives are difficult, and sometimes impossible, to fashion” (Donahue, 1989:77). Or stated differently, discretion, and especially payoff discretion, is a key issue when outsourcing such a critical public good. In New York City the mechanism to solve this issue is the rate-case-process, in which the Public Service Commission determines if utility rate increases are allowed. During this process, Con Edison submits a filing containing the justification for a rate increase, including details on the capital investments. The New York City government can offer comments and testimony before the Public Service Commission makes a decision on the proposed change (New York City, 2013a). In 2013, Con Edison filed a petition to change the rates it charges New Yorkers for electricity to the Public Service Commission. In that petition, Con Edison sought to increase its electricity rates by over \$400 million, to finance a \$1 billion investment in structural storm upgrades deemed vital after Hurricane Sandy (Fazio & Strell, 2014).

As the rate-case-process describes the New York City government was entitled to submit its comments to these changes and the proposed structural investments. During Hurricane Sandy several substation and transmission lines were flooded, and the city suffered huge economic losses due to the power outage. Therefore New York City was interested in gaining more influence over the proposed

investment plan by Con Edison. As the electrical distribution system is privatized, the city government is in a situation where its formal influence is very limited. Hence, the city government motivation to collaborate with Con Edison was highly related to the need for legitimately to be more involved. At the same time, it is also highly likely that the New York City government were interested in pushing for an innovation in governance in relation to the rate-case-process, as to more permanently increase its influence within this process. Motivation related to innovation is thus also relevant within this initiative.

In the 2013 PlaNYC the city government outlined their proposed collaboration strategy, which was to “work with utilities and regulators to protect these assets from future flood events. In the case of substations, the City, working with Con Edison, will prioritize investments by evaluating the role that each such substation plays in system reliability and the number and criticality of customers that it serves” (New York City, 2013a:125). In addition, New York City was committed to work with Con Edison and the Public Service Commission to develop a long-term resiliency plan for the electric distribution system.

The chance to advance and implement this proposed collaboration strategy came when the Public Service Commission established the Storm Hardening and Resiliency Collaborative. In tandem with the formal rate-case-process, a parallel collaborative track was established, namely the Storm Hardening and Resiliency Collaborative. The Collaborative consisted of a group of stakeholders, who was to address design standards, alternative resiliency strategies, and cost benefit analysis, of the proposed projects by Con Edison (Fazio & Strell, 2014). The Storm Hardening and Resiliency Collaborative consisted of Con Edison and the New York City government, plus leading researcher from Pace, Columbia and New York University, and the Environmental Defense Fund. The latter is an influential nonprofit organization working towards greater environmental protection (Consolidated Edison Company, 2013).

The work of the Collaborative was presented in a joint report in late 2013, and based on this report the Public Service Commission in 2014 approved the \$1 billion investment plan. The order ensures that the most critical Con Edison facilities, such as substations, will be hardened and made sufficiently resilient to meet the latest federal flooding projections. In addition, the Public Service Commission ordered the continuation of the Storm Hardening and Resiliency Collaborative (State of New York Public Service Commission, 2014). Hence, the city government and Con Edison will continue to meet and confer to address the implications of adverse climate conditions, and expand the conversation to also include severe and protracted heat waves and peak demand issues (New York City, 2014b).

The collaboration strategy used is very similar to a collaborative network, which is defined as a network of interdependent but operationally autonomous actors, which contribute to the production and implementation of public visions, ideas, plans and regulations (Sørensen & Torfing, 2005). The Storm Hardening and Resiliency Collaborative was exactly this, as it allowed for a range of different actors, all with specialized knowledge, to be involved in the initiative to increase the resiliency of the electrical distribution system. This fits well with the legitimacy motivation which according to Brinkenhoff (2007) also can arise from the need to engage private actors in an open decision making process. More so, the Collaborative was tasked with developing alternative plans and “go beyond the typical utility capital expenditure analysis, and to include alternative resiliency measures, such as microgrids” (Fazio & Strell, 2014:1). This ultimately increased the legitimacy of the decision and the projects that were proposed. With this collaborative network strategy the Public Service Commission expanded the collaborative interaction of the electrical rate-case-process, which is comparable to an innovation in governance. Again this is in line with the collaborative strategy used as collaborative networks can create innovation in governance because “framing of complex problems is often improved when actors with different experiences and perspectives and forms of knowledge are brought together” (Hartley, Sørensen & Torfing, 2013:826).

The order by the Public Service Commission allowed for a short-term increase in electricity rates to finance the \$1 billion investment, followed by a freeze from 2016. This implies that cost of these initiatives will be partially transferred to the consumers, in contrast to what New York City initially promised in PlaNYC from 2013. Here it was stated that “the City anticipates that most, if not all, of the infrastructure improvements related to the initiatives can be undertaken as part of the utilities’ ongoing capital programs, thereby avoiding any rate increases” (New York City, 2013a:128). The city government did nevertheless defend the increase by noting that while any increase in rates will impact customers and businesses, a single day without electricity can mean more than \$1 billion in lost economic output for New York City. In general, it is worth noting that till date the city government has only found 50% of the financial resources it needs to implement its \$3.7 billion coastal protection plan (New York City, 2015a).

Initiative: East Side Coastal Resiliency Project

The East Side Coastal Resiliency Project also arose in the wake of Hurricane Sandy. The southern Manhattan shoreline was greatly damaged during the hurricane and massive flooding occurred especially on the eastern side. This part of the city received a lot of attention as it is home to a very large

residential low-income population, with one of the highest population densities in the U.S. Furthermore the area contains critical structures for the subway system, the inner city highway and facilities from both water and power utilities (New York City, 2013a).

In the PlaNYC from 2013 the city government committed to creating flexible and adaptable, integrated flood protection systems at the most exposed shorelines in the city. These are systems composed of elements that can be combined and customized in areas where critical infrastructure or vulnerable neighborhoods require a high level of flood protection. Integrated flood protection systems can include a wide range of combined technologies including floodwalls, landscaping features, flood-proofed buildings bridge abutments, drainage improvements, flood gates, or deployable floodwalls. More so, the city government had set out to create integrated flood protection systems that would create a minimal impact on, and generally support, neighborhood structures during non-storm conditions. Solutions should also be scalable, as the city government was aware that finding the resources to implement these structures most likely would happen in phases.

This lack of access to funds also became one of the motivations to collaborate with the private sector. In line with arguments developed by Donahue (1989) the second motivation was arguably related to the lack of government knowledge, as the city government did not have the expertise to design these complex integrated flood protection systems. Consequently New York City had strong incentives to collaborate as it had very little understanding of the means and innovation needed to fulfill the goal. This falls within what this thesis terms innovation motivation.

The first step was to secure resources, and during 2013 “New York City took formal steps to establish a leadership role in advancing coastal protection initiatives. This involved a high level of coordination with federal and state funding and regulatory agencies” (New York City, 2014b:58). A collaboration strategy was agreed and named Rebuild by Design. Rebuild by Design was a design competition, where the devastating effects of Hurricane Sandy were seen as opportunities to spur innovative and creative processes to design integrated flood protection systems. A few geographical areas of New York City were selected to be the focus of the competition, where the southern shoreline of Manhattan was one. Funding for the Rebuild by Design competition and the implementation of the winning designs totaled \$930 million, of which the East Side Coastal Resiliency Project was given approximately a third. The federal government provided most of the funding but Rockefeller Foundation also contributed, along

with Deutsche Bank, Hearst Foundation, JPB Foundation, and Surdna Foundation (Rebuild by Design, 2016).

The form and structure of Rebuild by Design competition was new, but did in many ways resemble a strategic partnership. Rebuild by Design “set out a novel relationship among federal, state and local governments in which federal resources were used in a way that meant national thinkers could address local problems” (Rockefeller Foundation, 2014:42). This included significant efforts by all the financing partners to introduce, negotiate and come to resolution on funding streams and appropriations between each partner. This also implied that preference discretion had to be negotiated between the different vertical levels of government and with the private actors involved. Complex physical jurisdictions on the eastern shoreline complicated the negotiation on what federal funds could be used for. Consequently different government entities used a lot of time to communicate and resolve many of the more difficult implementation challenges associated with local acceptance and levels of jurisdictions (Rockefeller Foundation, 2014).

The strategic partnership collaboration strategy was also reflected in the more cooperative relationship that arose between federal and local government and the nonprofit organizations. For instance the standard model for federal design competitions is to define an existing problem, develop a brief and then solicit solutions from the best experts in the field. But New York City and the private partners advocated that the scale and complexity of Rebuild by Design implied that the call for proposals should be formed as an open-ended question and an inter-disciplinary cross-jurisdictional approach. In the end the federal government allowed the use of an open-ended formulation (Lochhead, 2014).

This also goes to show how the Rebuild by Design competition in it self showcased another collaboration strategy, namely procurement of innovation. The formulation of the competition resembles the notion of how governments can attempt to stimulate innovation by focusing on functional specifications. The need for innovation in this case was relatively clearly spelled out, as Rebuild by Design sought to bring local and international knowledge together to better understand vulnerabilities and interdependencies in flood protection. A winning proposal should therefore promote collaboration, ignite innovation, outside-the-box perspectives, and address new trends (Rebuild by Design, 2016).

The competition started in June 2013 where participants were chosen based on a concept note each team had submitted. Over the following six months the design teams were to engage with local

stakeholders and develop their design idea. By early 2014 final design ideas were submitted and winning designs were made public a few months later (Rebuild by Design, 2016). The winning design for the southern Manhattan shoreline, later scaled and renamed the East Side Coastal Resiliency Project, was developed by BIG Architects and its team of seven additional companies. The design won, as the solution was “widely recognized as a sophisticated responses to the challenges of urban development, to create dynamic public spaces and forms that are as programmatically and technically innovative, as they are cost and resource conscious” (Rebuild by Design, 2016:1).

Figure 5: Illustrations of East Side Coastal Resiliency Project



(BIG Architects, 2016)

The East Side Coastal Resiliency Project has received considerable attention due to its innovations. Lochhead (2014) finds that the innovative solutions included in the East Side Coastal Resiliency Project are a result of the extensive precedent studies undertaken by BIG Architects in combination with global best practice, and widespread involvement of community input on local contexts. The process was research-led, open-source, and collaborative as to better refine the nature and scope of the complex challenge and develop this comprehensive design solution. More so, “the sheer number of participants, range of disciplines, and integrated team structures facilitated a multiplicity of ideas and approaches but also more holistic strategies” (Lochhead, 2014:2). In the end the result was a new approach to flood protection with multipurpose barriers integrates green space, social programs and transportation needs.

The actual implementation of the East Side Coastal Resiliency Project still lacks funding. The initial design proposal by BIG Architects called for 10 miles of continuous waterfront flood protection, but funding to date only allows for the first few miles to be constructed (Rockefeller Foundation, 2014). The city government and State of New York have found an additional \$14 million, but New York City continues to pursue additional funds for this project, so that eventually the entire 10 miles can be built. Construction is expected to start in 2017 (New York City, 2015a). The collaboration strategies used have, however,

already been deemed a success. In an evaluation of the Rebuild by Design the Rockefeller Foundation (2014) determines that this approach has provoked a paradigm shift in the way that architects and governments approach both resiliency and flood protection.

Water and Pollution Control

In New York City every aspect of water management is under the authority of the New York City Department of Environmental Protection. This is the only water utility, it is entirely public, and the Department of Environmental Protection functions as any other part of the city government, besides the fact that it creates its own revenue stream. The department employs 6,000 people and does everything from policing the water reservoirs in upstate New York, to sewer and wastewater operation, costumers service, and climate change planning (New York City, 2016b).

Throughout the PlaNYC's stormwater, water supply and wastewater have been a focus area for the New York City government. The city is especially challenged during heavy rainfalls, which overburdens the wastewater treatment system, and more generally to increase the capacity of the city's 14 wastewater treatment plants to handle the growing population. At the same time wastewater treatment is an energy intensive process. Against this background the first 2007 PlaNYC sets out 10 concrete initiatives to improve water quality. These included implementing infrastructure upgrades, prevent stormwater from entering the sewer system, and analyze best management practices to obtain these goals (New York City, 2007). In the PlaNYC from 2011 the city took another important step in implementing the Clean Water Act secondary wastewater treatment standards. This was arguably also long overdue as "all 14 of the City's wastewater treatment plants will meet monthly secondary treatment standards for the first time since the standards were established in 1972" (New York City, 2011:64). This was, among other things, the result of massive investments the city made in the Newtown Creek wastewater treatment plant to expand its capacity.

The focus on implementing green infrastructure also contributed factor, as this can help absorb rainwater before it enters the sewer system (New York City, 2007). In 2010, the city launched a Green Infrastructure Plan to systematically expand the use of this approach and allocated \$1.5 billion over 20 years (New York City, 2011). With the latest PlaNYC, the city will expand green infrastructure and stormwater management into all neighborhoods across the city. The city has also set targets to lower the net energy use of wastewater plants, as part of the emission reduction plan (New York City, 2015a).

Both the flagship initiatives, which this subsection will focus on, can be traced back to PlaNYC from 2007. In 2007 funds to upgrade the wastewater facility at Newtown Creek became the underpinning for the ongoing initiative to construct a purification system to convert biogas from the wastewater into renewable natural gas. The second flagship initiative is the Green Infrastructure Pilot Program, which was used to test solutions for the Green Infrastructure Plan.

Initiative: Green Infrastructure Pilot Program

The background for investing in green infrastructure were calculations made by New York City (2007) which showed that between 1984 and 2002 9,000 acres of green space were lost in the city and subsequently this implied a loss of natural ways to absorb 243 gallons of rainwater for every inch of rain. The calculations also showed that every acre of new green infrastructure the city would construct, could hinder 55,000 gallons of stormwater yearly to enter the wastewater system. Increasing the amount of green infrastructure was thus believed to be an effective way to tackle the problem of overburdened wastewater plants and sewer capacities. With the Green Infrastructure Plan the city quantified these gains, and estimated to save \$2 billion in grey infrastructure investments (New York City, 2011). The challenge was that uncertainty remained about which specific types of green infrastructure would bring the biggest benefits in a New York City context. The city decided to initiate the Green Infrastructure Pilot Program, to “provide a framework for testing, assessing, and implementing small installations to control stormwater at its source, which are known by various terms – source controls, green infrastructure, low impact development, best management practices” (New York City, 2008a:7).



The goal of the Green Infrastructure Pilot Program was for the Department of Environmental Protection to test green infrastructure solutions. The Department of Environmental Protection looked to the work of the federal environmental agency and decided to base its own Pilot Program on federal reports on how to construct source controls, management practices and studies of traditional green infrastructure solutions (New York City, 2008a). This also suggests that the primary motivation for the government to collaborate with the private sector was not a wish to innovate the solution used. This is reflected in very little innovation involved in the choice of green infrastructure types that were tested, with only the six most common types included in the Pilot Program. These are bioswales, larger bioretention areas, porous pavement, constructed wetlands, blue roofs, and green roofs. In total 30 pilot sites were included in the program (New York City, 2015e).

However, the city government had little experience within green infrastructure and as Donahue & Zeckhauser (2011) suggest, in some instances information is so embedded in a private actor that it is difficult to transfer to the public sector. In line with this efficiency argument the Department of Environmental Protection chose a collaboration strategy that would involve the private sector in the detailed design and monitoring and of the Pilot Program. These tasks were through the procurement of contracts delegated to two of the biggest private water consultancy companies HDR and Hazen & Sawyer (Biohabitats, 2016).

The outcome of the Pilot Program was published in 2013 after three years of monitoring. The Pilot Program quantified the co-benefits for each types of green infrastructure and made a life cycle analysis of the environmental and economic costs of construction and maintenance (New York City, 2015e). Local Governments for Sustainability (2010) found that this kind of pilot program had been vital in New York City's success with adopting performance standard for new buildings to detain stormwater onsite and design guidelines on citywide scale. More so, the Pilot Program is "one of the most comprehensive studies of source control approaches and is one of the few to look at source controls in a dense, ultra-urban environment. The plan is also an example that implementation is an iterative process that can involve piloting various techniques to test solutions before they are implemented citywide" (Local Governments for Sustainability, 2010:42).

Table 3: Outcome of the Green Infrastructure Pilot Program

Practice Type	Carbon Sequestration	Reduced Urban Heat Island Effect	Reduced Building Energy	Urban Habitat	Improved Air Quality	Improved Quality of Life	Reduced Stormwater Treatment Needs	Green Jobs	Life Cycle Environmental Costs	Life Cycle Economic Costs
Bioretention with a Tree	●	●	●	●	●	●	●	●	●	●
Bioswale with a Tree	●	●	●	●	●	●	●	●	●	●
Stormwater Wetland	●	●	●	●	●	●	●	●	●	●
Bioretention without a Tree	●	●	●	●	●	●	●	●	●	●
Green Roof	●	●	●	●	●	●	●	●	●	●
Blue Roof		●	●			●	●	●	●	●
Porous Pavers		●	●			●	●	●	●	●

 Least relative benefit
  Moderate relative benefit
  Highest relative benefit

(New York City, 2015e:35)

Based on the success of the Pilot Program, New York City (2014c) did in 2013 initiate a more comprehensive research and development program. The Department of Environmental Protection has dedicated \$8 million over five years to this continuation. These new research and development effort will

evaluate the entire Green Infrastructure Plan and will focus on long-term performance success, ensure cost-effectiveness of maintenance programs, and conduct cost-benefit analyses of various green infrastructure designs. This initiative is in a similar fashion as the Green Infrastructure Pilot Program based on a procurement of contracts collaboration strategy. However, this time gains in effectiveness may have been limited as the new research and development program “will move ahead in 2015 after encountering a contract-related delay in 2014” (New York City, 2015e:36). It is nonetheless noteworthy how extensive the use of private consultants have been in this process and that New York City despite its size have still chosen to rely on public-private collaboration within this research process.

Initiative: The Newtown Creek Plant

The second flagship initiative is the renewable natural gas project at the Newtown Creek Plant. This initiative is not strictly related to increasing the capacity of the wastewater treatment plant itself, but a complementary initiative. This initiative is more related to the emission reduction goal, as approximately 7% of the city government’s emissions stem from methane produced by wastewater treatment plants. In 2007 the expansion of the plant was initiated and in the 2011 PlaNYC the natural gas project was publicly announced. If methane is captured, this is a natural gas that can be used for power and heat generation. “We are pursuing innovative cogeneration and waste-gas-to-grid projects at the Newtown Creek Wastewater Treatment Plant. This projects can reduce emissions with minimal direct cost to the City and will establish a financial model that can be replicated at other urban sites” (New York City, 2011:115).

The government motivation to involve the private sector in this initiative closely resembles resource motivation as Skelcher (2007) describes it. By collaborating with the private sector the New York City government can limit the upfront capital financing, which is sizable in this type of initiative. As this plant would be the first ever U.S. waste-gas-to-grid project, risk sharing with a private partner may be a highly plausible motivation.

In line with the associated collaboration strategy the city enters into a joint venture with the private energy provider, National Grid (New York City, 2011). As part of this collaboration strategy National Grid agrees to fund all the capital costs related to construction, operation, and maintenance. The capital investment required is an estimated \$7 billion (National Grid, 2014). In exchange National Grid is guaranteed an annual stream of gas from the wastewater treatment plant free of charge. Several other companies are also involved in the partnership, to for instance provide engineering, procurement and

construction services including AECON, Ennead Architects and Waste Management Inc. (National Grid, 2014). It is the high degree of contractual relationships between the parties, the upfront financing followed by a revenue sharing agreement, the clearly public defined goal of emission reductions and the operational freedom, which makes this collaboration strategy a joint venture.

As with MillionTreesNYC, the collaboration also includes elements of a strategic partnership. By the city, this project is also perceived as having broader mutual benefits, as this is a "terrific example of how New York City is the test bed for bold ideas in clean energy and developing renewable biogas at Newtown Creek will serve as a blueprint for the type of transformative, sector-crossing projects needed to improve our air emissions and meet our greenhouse gas reduction targets" (New York City, 2013d:1). There are also signs that the city government and the private sector have focused on the issue of discretion. "Once project costs have been recouped, profits will be split between Department of Environmental Protection and National Grid's customers" (New York City, 2013d:1). More so, New York City (2013d) does in this regard highlight that from the start of this project, National Grid has worked with regulators, the city government and local stakeholders to assure alignment of interests.

How this collaboration strategy will function in more detail is still to be seen. As of now the focus is on construction, which has been postponed several times. In 2011 the project was expected to start in 2012, but in the 2013 progress report on the PlaNYC, construction was still only expected to start within the year (New York City, 2013b). With the 2015 PlaNYC, construction was expected to begin late that year. Also, the project has been expanded to become part of a new city government goal, namely to drastically reduce the amount of waste that ends at landfills. The operation of the Newtown Creek Plant was therefore extended to also accept food waste. This additional system is expected to be operational in the late 2015 (New York City, 2015a).

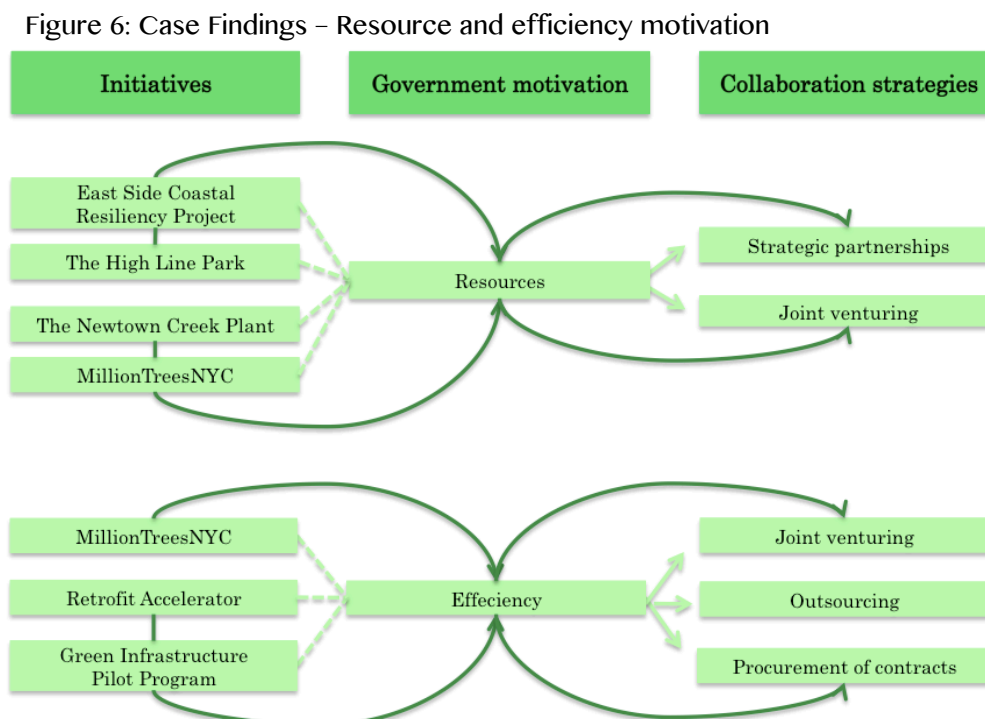
This concludes the analysis section of this thesis and the eight initiatives chosen to represent the case of climate change planning in New York City. The following section will discuss the case findings and the trends found within government motivations and collaboration strategies.

CHAPTER 5: DISCUSSION

Case Findings

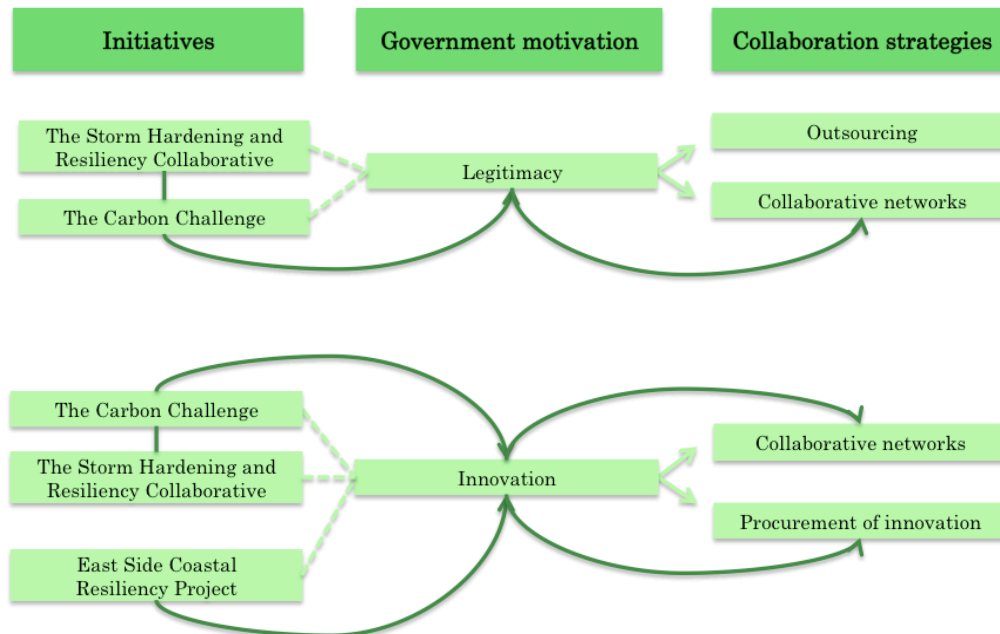
Based on the case study findings, this subsection will discuss how city government motivations influence the use of collaboration strategies in climate change planning. The first part focuses on the degree to which the theoretical framework, and the causal effect of government motivation, is seen reflected in the case study. The second part will discuss trends in the findings within government motivation and the use of collaboration strategies within this new policy realm.

The below figures illustrate the government motivations identified and the subsequent collaboration strategy used in each of the initiatives analyzed. Overall the case findings support the theoretical framework and as the case study suggest that government motivation has a causal effect on the use of collaboration strategy. Within all eight analyzed initiatives the identified government motivation was combined with the use of one of the associated collaboration strategies from theoretical framework. This also indicates that the theoretical framework is relevant even when used to investigate a new policy realm like climate change planning by cities.



The fact that the case findings to this degree support the theoretical framework is a central conclusion of this thesis. Even though public-private collaboration strategies in climate change planning by cities have received little attention in the literature, it suggests that the overall framework, including all four possible government motivations and associated collaboration strategies, is also applicable within this policy realm. The only collaboration strategy not to be identified in the case study is outsourcing.

Figure 7: Case Findings – Legitimacy and innovation motivation



As dual government motivations were found in some initiatives, some initiatives are mentioned twice. This is also an important finding, as it highlights how governments may have several simultaneous motives to collaborate with the private sector. This was the case in the MillionTreesNYC initiative, where both resources and efficiency motivated the government to collaborate, and in both the Storm Hardening and Resiliency Collaborative and the Carbon Challenge, legitimacy considerations and innovation needs were found to motivate the New York City government. What is noteworthy is how dual motives in all three initiatives do not contradict the theoretical framework, but instead strengthen it. These three initiatives underline how the same associated collaboration strategy can arise based also on dual motivations. To explain, collaborative networks are according to the theoretical framework associated with legitimacy considerations and innovation needs. In both the Storm Hardening and Resiliency Collaborative and the Carbon Challenge, where legitimacy considerations and innovation needs were found to coexist, one collaboration strategy, namely collaborative networks were found used. In the same manner joint venturing is associated with both resources aspects and efficiency

arguments. In the MillionTreesNYC initiative, joint venturing was used and both resources and efficiency were identified as motivations.

The East Side Coastal Resiliency Project also highlights another important notion. This initiative was also found to showcase two government motivations, both resource aspects and innovation needs. In contrast to the three other initiatives, where dual government motivation was in play simultaneously, the East Side Coastal Resiliency Project was firstly found to be a case of resource motivation, followed by the use of a strategic partnership collaboration strategy to create the Rebuild by Design competition. Subsequently, this design competition was motivated by innovation needs, and the collaboration strategy used was similar to procurement of innovation. This goes to show that within one initiative different government motivations may also arise at different times during the implementation, and different collaborations strategies can be used successively. As with the other initiatives where dual motivations have been analyzed, this highlights how the real world is complex and interconnected. It exemplifies what Easton (2010) noted concerning critical realism. Namely that this philosophy of science allows mechanisms to be investigated separately even though in practice such formal explanations will not normally be possible because of the complexity of real world behavior.

One additional finding concern the four specific climate change sectors analyzed. These being parks and green areas; emission reductions and retrofits; flood protection and resiliency; and water and pollution control. The case findings do not suggest that there is a relation between climate change sector and the types of government motivations or collaboration strategies. Within all four sectors different motivations and collaboration strategies are observed.

Trends in Government Motivations

Based on the case study of New York City and climate change planning, it is also evident that some types of government motivations may be more relevant within this new policy realm. Greve (2010) found that it could be argued that motivations for collaborating with the private sector have shifted over time. Earlier resources was a key motive, currently efficiency and whole-of-life costs are motivating many governments, while innovation is likely to be a central motivation in the future. This case study of New York City challenges the notion of diminishing resource motivation, as this is found still to be key within climate change planning in cities. However, it does in many respects also indicate that the role of innovation needs are increasing, and that efficiency arguments are central to government motivation.

In terms of resource motivations, four out of eight initiatives are found to involve resource motivation. One explanation may be that this type of motivation is easier to detect, based on the sources available to this thesis. Due to the comprehensive nature of a plan like PlaNYC, and the fact that this is a political planning document, the question of funding is also more likely to be addressed upfront than perhaps other types of motivations. With this reservation, the case study suggests resource aspects still to be a central motivation for the city government. The scale of resources needed by the city government was highlighted especially in the section on parks and green areas. In fact it was in 2002 estimated that private partners yearly raised \$50 million for parks alone, and volunteers supplied one million hours of work in the parks (Donahue & Zeckhauser, 2011). In addition, the parks department “has invested approximately \$5.7 billion to build new parks and improve existing ones during the past two decades (1992-2013). Although a significant fiscal commitment in itself, this figure does not even account for capital dollars spent on parks by other New York City public agencies and authorities, private sector developers, or conservancies. Yet despite this high-value investment, the existing capital need across the system remains extensive” (New York City, 2014d:10). The two initiatives concerning flood protection and resiliency also emphasize the need for resources. Ongoing initiatives “will continue to require funds and new sources of financing. While the City has successfully launched its first phase of a coastal protection program with nearly half of the funding secured, more funds are needed now and in the future to implement this program fully and effectively” (New York City, 2015a:245). The challenge of financing climate change initiatives was also highlighted in COP21 where closing of the financing gap received considerable attention on the mayor’s agenda.

Literature on urban climate change planning by Bulkeley (2011) confirms this trend and finds that resources are a critical issue in climate change planning by cities. “Many municipal governments in developed countries also lack the resources to address climate change, especially when it is not considered a political priority. In this context, the ability to secure funding from external sources has been shown to make a significant difference in the local capacity to address climate change” (Bulkeley, 2011:471). Bulkeley (2011) subsequently find that case studies indicate that climate change planning instead is implemented through the day-to-day activities of local governments. This can be instrumental in overcoming the inflexible budgetary structures of a city government. It is against this background this thesis finds that resource motivation continues to be central within this policy realm.

The possible drawback of this urgent motivation is that the associated collaboration strategies are those

that involve giving up higher degrees of discretion, namely strategic partnerships or joint venturing. Rosenzweig & Solecki (2010) on the other hand notes that climate change initiatives may be a resource opportunity as well. While most U.S. cities are struggling to finance the existing investments in infrastructure, climate change adaptation can provide additional incentives for funding from local, state, and federal sources. Used wisely there may be obtainable investment synergies in this regard.

In terms of efficiency motivation the case study does also find that this is a motivational factor to the city government. However, where Donahue (1989, 1999, 2002) focuses on efficiency gains based on external agents' productive capacities, efficiency advantage, and economies of scale, government motivation within this case study tend to be a little different. Instead efficiency motivation in both the Green Infrastructure Pilot Program and the Retrofit Accelerator is motivated by the better information, vital data, and technical know-how held by the private sector. It is on this basis, this thesis finds there to be a trend in efficiency argument to resemble notions by Donahue & Zeckhauser (2011), where better outcomes are a result of the embedded nature of information. The fact that much of climate change adaptation and mitigation are within knowledge intensive sectors may be part of the explanation.

The case findings also suggest a growing trend in the relevance of innovation motivation. Related to the above, innovation in the East Side Coastal Resiliency Project and the Carbon Challenge were greatly associated with the ability of the private sector to use their specialized knowledge to cut emissions or design flood protection systems. In both cases the city government motive to collaborate was arguably also intensified by the fact that the city government had very little understanding of the means the private sector would use to reach the goal set out for the collaboration (Donahue, 1989). As Donahue & Zeckhauser (2008) note the potential gains from sharing discretion with the private sector, including nonprofit organizations, are contingent on the government's relative weaknesses, whether in productivity or information. In this policy realm the case findings suggest that the city government is willing to share especially production discretion due to this relative weakness in city government specialized knowledge.

Lastly, within two of the initiatives the wish of the city government to increase legitimacy was found to motivate the public-private collaboration. This is also a noteworthy finding as it does suggest that legitimacy motivation is almost as widespread as the other types of motivation. This is in contrast to the relative little attention this motivation has been granted in the academic literature, compared to the other three motivation types. More so, all three sources of legitimacy are seen reflected in the initiatives.

These sources are structure, process and outcome (Brinkerhoff, 2007). The structure, hence who participated, and improved outcome legitimacy were in play in the Storm Hardening and Resiliency Collaborative initiative. While in the Carbon Challenge it was the process, hence how the private sector participated, which had the potential to increase the legitimacy of the initiative. The degree to which climate change planning is perceived as a legitimate task for city government action is likely to be highly relevant in this regard. This is because Donahue & Zeckhauser (2008) find collaborating with a private actor is most likely to occur if a particular undertaking is seen as inappropriate for a government to pursue on its own. If an initiative is considered a pure public good it is also likely to enjoy greater public support, and be accorded more legitimacy by citizens (Brinkerhoff & Brinkerhoff, 2011). Whether New Yorkers perceived climate change planning less appropriate than other policy realms, is outside the scope of this thesis. However, this could be a plausible influencing factor in why legitimacy motivations are found in this case study and a trend that should be considered when investigating the issue of public-private collaboration in climate change planning by cities. If this is the case, legitimacy needs may be even bigger in other cities, because Hurricane Sandy did spur a sense of urgency and relevance of climate change adaption in New York City (New York City, 2013a).

Trends in Collaboration Strategies

As with government motivations, the implantation of PlaNYC also highlights some trends in the use of collaboration strategies. As noted in the above, resource motivations are associated with strategic partnerships, which the case findings suggest have been repeatedly used, either as the primary, or as elements, in collaboration strategies. Along similar lines, innovation and legitimacy motivations are associated with collaborative networks, which the case findings also suggest to be used frequently.

Both the East Side Coastal Resiliency Project and the High Line Park were implemented with the use of strategic partnerships. The key to these being that the city allows the private partner to gain discretion and influence on the specifics of the goal, as well as collaborating on decisions concerning the implementation phase. The Rockefeller Foundation (2014) similarly noted a development in the collaboration practices of the city government. In relation to the East Side Coastal Resiliency Project, this it is arguably reflected in the “innovative departures from traditional federal practice in the execution of the competition through its unique public-philanthropic partnership” (Rockefeller Foundation, 2014:xi).

This trend is also reflected in the use of strategic partnerships elements in three additional initiatives. In

the Retrofit Accelerator, MillionTreesNYC, and the Newtown Creek Plant, the city government has used elements of strategic partnerships, in a way creating mixed collaborations strategies. The collaboration strategy used in the Retrofit Accelerator, which mixes procurement of contract and element of strategic partnership, arguably demonstrate “New York’s continued leadership in innovative approaches to meeting greenhouse gas emission goals and setting the bar for other world-class American cities and [...] global precedent for wide-scale adoption of energy efficiency in the public and private sectors” (New York City, 2015c:1). This increased use of strategic elements may be a powerful trend, which even the city government itself seems to expect other cities to follow. More so, Freedman Consulting (2013) identifies several collaboration strategies used by the city in other initiatives, which include elements of strategic partnership. These include co-led public and private campaigns, co-location of public and private services and the establishment of an independent nonprofit organization that can raise public and private funds. As the case study also highlights, these strategic partnership elements are used in an attempt to create mutual benefits. The Carbon Challenge being another example of this. Conclusively “New York City’s openness to new methods of collaboration has spawned a range of innovative approaches, each driven by a common understanding of the problem and a careful allocation of responsibility between sectors and partners” (Freedman Consulting, 2013:6).

The second central trend within collaboration strategies suggested by the case is the use of collaborative networks. In two initiatives, the Carbon Challenge and the Storm Hardening and Resiliency Collaborative, this was the primary strategy used. Freedman Consulting (2013) also noted this development in the collaboration strategies used by the city, as “New York City officials emphasize that public-private partnerships in New York are much more than purely financial relationships. So much of what we do is bringing people together, bringing together ideas” (Freedman Consulting, 2013:6). The positive effects of using collaborative networks was also highlighted by the New York City government, which found that Carbon Challenge “works by creating a platform for the exchange of ideas, and providing the tools needed to achieve reductions in the energy use and emissions, motivating voluntary action” (New York City, 2013c:8). Especially in the area of energy efficiency and retrofits New York City (2016a) finds that its initiatives and the collaboration strategy used during the implementation, are part of a novel trend of effective, industry transforming, and internationally recognized practices.

In both the initiatives collaborative networks also fulfilled a critical function. This is because climate change arguably requires collective responses, which demand governments to serve as advocates

alongside its traditional role as policymaker. The use of collaborative networks allow city governments to explore and expand their role in public-private collaborations, because the loosely defined structures of collaborative networks imply city governments can take on new roles such as facilitators, educators, or activists. Freedman Consulting (2013) further finds this collaboration strategy to be a possible attempt to close the flexibility gap that exists in policy realms where regulation is constrained or unwanted. In such circumstances network governance is sometimes the most efficient means of helping government to operate more effectively. Bulkeley & Betsill (2013) did in their study of urban politics of climate change note a similar trend, as their analysis focused on the ways in which network forms of governance are used in the absence of formal processes of enforcement.

New York City and the private sector are also collaborating in more contract oriented ways, where complementarity is the focus and collaboration consists of the city government asking the private sector to take on the functions it is most efficient at (Freedman Consulting, 2013). The case study findings also suggest that collaboration strategies, like procurement of contracts, is not irrelevant when city governments undertake climate change initiatives. There are, nevertheless, considerable findings which suggest that collaboration strategies used within climate change planning, are moving toward what Donahue & Zeckhauser (2011) define as more extensive forms of public-private collaboration. These are strategies with more shared discretion and where private actors help to determine both the means by which a broadly defined goal is achieved, and the specifics of the goal.

Novel Collaboration Issues

In addition to the trends, the case study also highlights novel collaboration issues within climate change planning by cities. These issues are essentially additional potential explanatory mechanisms identified during the case analysis, which also influence the use of public-private collaboration. These are issues that the theoretical framework did not anticipate, possibly because it was not specifically developed to inform public-private collaboration within this new policy realm. The novel issues fall within three areas, namely new policy issues, structural issues and partner issues.

Policy Issues: Climate Change

Most public-private collaboration theory is developed based on studies of other policy realms than climate change. The fact that climate change planning as a policy realm is different than from other

areas, was a key reason for this investigation in the first place. This subsection will focus on the specificities of this issue and its influence on public-private collaboration. Issues in regards to climate change will be based on a discussion of wickedness within this policy realm. A wicked policy problem is characterized by four issues, which is will be invested. These are incomplete information, diverse policy drivers, no simple solution, and inclusion of multidimensional policy areas.

As a general remark, it should be noted that governments have always had to deal with wicked policy problems. In public infrastructure projects “most governments around the world have for years made decisions about large-scale public infrastructure projects with long lives, have dealt with complex policy matters, and have worked with the private sector to build and develop infrastructure. So the challenge of infrastructure development has always, in a sense, been a central part of the democratic governance project” (Hodge, Greve & Boardman, 2010:3). Nevertheless, the nature of a wicked policy problem does imply that it is a new challenge each time, as it involves different risks, new uncertainties and no consensual solution (Rittel & Webber, 1973). The theoretical framework of this thesis peripherally touches on the issue of wickedness, by noting that innovation in governance can be a government motivation to collaborate with the private sector (Moore & Hartley, 2008).

Firstly, Bhan (2013) does in his analysis of environmental policy in the U.S. find that climate change policy is a wicked policy problem, as it is characterized by incomplete or contradictory information. The New York City case study substantiates this notion with findings from both the Green Infrastructure Pilot Program and the Retrofit Accelerator initiative. Each showcases the issue of government’s incomplete information. The case study also exemplifies what Bhan (2013) finds this implies to public-private collaboration. Namely, that the wickedness of climate change deems it technically necessary to bring in private actors which can interpret the increasing complexity and fill the information and knowledge gap. Wickedness “needs to be solved using a collaborative endeavor that takes advantage of the specialization and professional expertise offered by the private, semi-private, and nonprofit sectors” (Bhan, 2013:51).

This suggests that public-private collaboration may not be a choice but in some cases a prerequisite for tackling climate change. Donahue & Zeckhauser (2011) argue that this is not an unknown situation for governments, but it does suggest that the influence of the private actor involved in the collaboration increases considerably. This may especially increase outcome and payoff discretion of the private actor.

On the other hand, it can also be argued that allocation of discretion only gives each party authority where its information, expertise, and interests are greater. Hence, the better discretion is shared, the more value created is created, ultimately enhancing the wellbeing of both (Donahue & Zeckhauser, 2011).

Secondly, Bulkeley (2011) finds that the wickedness of climate change planning is reflected in the diverse factors, which drives this policy realm. A few of these are the potential for profit, the urgency of the issue, the potential to expand political authority and claim additional resources, and various forms of ideological expression. Solecki, Patrick & Sprigings (2015) also investigate climate change policy drivers, and finds that what speeds up the process can be extreme weather events, potential for catastrophic impacts, new knowledge, and opportunities to revisit existing policies. In the case of New York City, it was arguably a disaster event coupled with available human and financial resources, which were the key drivers in shifting the policy priority, resulting in policy shift in 2012 (Solecki, Patrick & Sprigings, 2015).

Subsequently, public-private collaboration has not, and will not, be a static or uniform process, but instead will reflect the many mechanisms and policy drivers (Bulkeley, Broto & Edwards, 2012). This is likely to lead to the use of new or mixed collaboration strategies. Stated differently, “in response to rising citizen expectations, dire fiscal constraints and a growing number of wicked problems [...] complexity cannot be solved by standard solutions or by increasing the funding of existing mechanisms” (Hartley, Sørensen & Torfing, 2013:821). This trend to use mixed strategies was also reflected in the case study, especially in use of strategic partnership elements in collaboration strategies.

Thirdly, a wicked policy problem is also characterized as a problem where principal choices have to be made, as there is no one right way. This also characterizes climate change, which according to a study by Stavins (2002) on environmental governance in the U.S. implies a choice between two policy directions. Either a government can choose the “conventional approaches to regulating the environment which are often referred to as command-and-control regulations, because they allow relatively little flexibility in the means of achieving goals. Such regulations tend to force firms to take on similar shares of the pollution control burden, regardless of the cost” (Stavins, 2002:174). Alternatively the government can go with a market-based instrument, which is a regulation that encourages behavior through market signals rather than through explicit directives regarding levels or methods.

New York City did in this regard choose the market-based instrument, which is reflected in Carbon Challenge and in the overall approach of the city to energy efficiency. Stavins (2002) also notes how this

market-based approach depends on the existence of well-informed producers and consumers, which is very much the goal of the Retrofit Accelerator initiative. The flexibility inherent in market-based instruments does, however, create uncertainty about distributional and environmental impacts of initiatives. On the other hand, market-based instruments will often encourage emission control efforts that are in the own interest of those affected. This is also underlined in the New York City case, where the city government emphasizes cost saving and the mutual benefits of energy efficiency. In the Carbon Challenge New York City (2013c) repeatedly stresses how the participating institutions stand to gain from the emission reductions obtained. The potential downside is that the focus on the ‘win win’ potential of addressing climate change can be central reasons why initiatives in many cities remain concentrated on issues of energy efficiency and focused on picking the low hanging fruit, rather than engaging with more fundamental and politically difficult choices (Bulkeley, 2011).

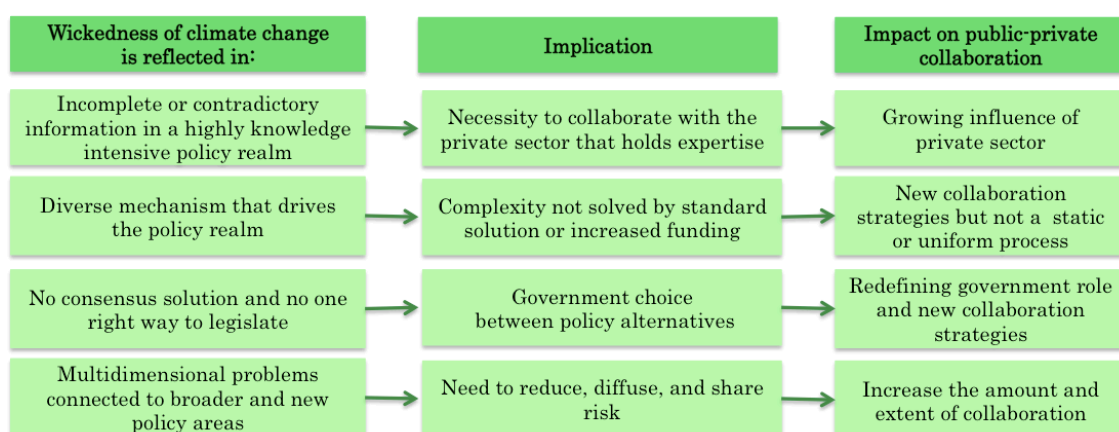
As also highlighted by the case study, the market-based approach implies that a city government has to rethink their collaboration strategy with the private sector, as to mend the uncertainty about distributional and environmental impacts. Freedman Consulting (2013) found this to be the case especially in energy efficiency initiatives in New York City. Rethinking collaboration strategies “can also sometimes allow government to take on new roles, such as when a problem requires a collective response or demands that government serve as advocate alongside its traditional role as policymaker” (Freedman Consulting, 2013:15). Along similar lines, Bhan (2013) finds that because there is no one right way, climate change “has prompted the redefinition of the traditional roles of the government, the private sector, and non-governmental actors. This redefinition process has given rise to a combination of innovative approaches including voluntary agreements, cross-sector collaborations, and information-based approaches” (Bhan, 2013:49).

Lastly, the wickedness of climate change is also reflected in how this policy realm spurs multidimensional policy problems, including complex interactions with other issues (Rittel & Webber, 1973). To exemplify, “addressing climate change has often been linked to the development of a ‘green’ economy and the potential for technical innovation and new sources of employment” (Bulkeley, 2011:473). This is also connected to the aforementioned second phase of urban climate change planning, where governments have started to approach environmental governance as strategic urbanism. Solecki, Patrick & Sprigings (2015) likewise find that climate change has become associated with new questions like urban sustainability and livability. They argue this has a positive impact on accelerating climate change action.

Linking climate change to another or bigger urban policy areas is also exemplified in the new city government, under mayor Bill de Blasio. The city government for instance emphasized how the 2015 PlaNYC initiatives have a positive effect in job creation and economic activity. For instance initiatives to “retrofit public and private buildings to reduce emissions, generate jobs and business growth in construction and energy services, and provide operational savings to owners and tenants” (New York City 2015a:174). More so, the climate change agenda is also connected to overarching issues like urban livability and inequality. This issue was also highlighted in chapter 4, where it was noted that recently municipal governments sought to re-frame climate change as an issue through which other significant local agendas (Bulkeley & Betsill). When Michael Bloomberg was mayor the justification often resembled an efficiency argument, where climate change planning was emphasized because it is the most effective way to protect the city. The government stressed how \$1 spent on mitigation would save \$4 down the road on post-disaster rebuilding (Lochhead, 2014). The case study has also touched on this issue, through the focus on legitimacy motivation. The movement to link climate change planning to broader or other policy realms can, in tandem to being a response to wickedness, be seen as an attempt to also increase the legitimacy of government involvement. Especially if climate change is connected to policy areas that are close to true public goods.

Bhan (2013) further argues that the implication of connecting climate change to large-scale questions is an increase in the interdependence of a wider range of actors. His proposed response is to increase the amount and extent of collaborative interaction in order to reduce, diffuse, and share risk. New York City arguably agrees, as the city government in an evaluation of the factors contributing to the success of the PlaNYC finds this to be due to increased cooperation within city government agencies, coordination with a wider range of stakeholders, the use of advisory boards, and policy-making not driven by business as usual (New York City, 2013a).

Figure 8: Climate Change – Novel collaboration issues



Structural Issues: City Centric

In the beginning of chapter 4, during the introduction to climate change planning by cities, some of the issue arising due to this being a city centric policy realm was mentioned. This subsection will further discuss the novel collaboration issues that arise, as cities are the central government entity instead of national governments. The theoretical framework does not explicitly deal with the issue of national versus local government, but as this subsection will discuss, this may influence public-private collaboration. The issues being fragmented physical jurisdiction, limited authority over some sectors and an international organizational vacuum.

Firstly, a very tangible challenge for city governments is highlighted by Rozenzweig & Solecki (2001) in their study of the New York metropolitan area's response to climate change. This is the problem of fragmented physical jurisdictions within the geographical borders of the city. Bulkeley & Betsill (2013) identify similar complexities and conclude that a key challenges in climate change planning by cities is the multiple overlapping and interconnected horizontal spheres of jurisdiction. To exemplify, 40% of the parks in New York City are not owned by the city, but by other entities, mostly the state and federal governments (New York City, 2011). Similar problems were noted during the East Side Coastal Resiliency Project, as not all of the shoreline is under city government control, because state, federal, and private actors control parts of it. State owned buildings in New York City are likewise not part of the emission reduction initiatives.

This limits holistic implementation of initiatives and in the case of New York City fragmented physical jurisdictions have also influenced the scope of climate change initiatives. This also implies that the limits of climate change planning are highly dependent on the relations between local, state and federal government, with the city government being severely constrained without the support of other levels of government. This fragmentation has also been argued to favor short-term political thinking, which is troublesome, as it continues to impede the necessary integrated solutions that climate change planning calls for (Rozenzweig & Solecki, 2001; Bulkeley & Betsill, 2013; and Jones, 2013).

Is it based on this argumentation that Jones (2013) concludes that effective climate change planning in federal systems require collaboration and coordination between all levels of government. Similarly, the response of New York City (2011) is to strengthen the collaboration with state and federal agencies. The goal being to improve cooperation, to solve the problem of fragmented jurisdictions when they arise.

While this does not strictly influence public-private collaboration, it indirectly has the possibility to make public-private collaboration much more complex, because the number of public entities that must be involved increases. The East Side Coastal Resiliency Project became an example of this, as the fragmented physical jurisdiction of the shoreline created confusion over which procurement law was to be followed. Federal procurement law, in contrast to city law, namely implied that the winning design team could not directly be hired to also lead project implementation (Rockefeller Foundation, 2014).

The first of two additional notions is also that awareness about fragmented physical jurisdictions can contribute to the understanding of “how ideas and norms are mobilized to create particular conceptions of the climate governance problem and the relevant scope of urban responses” (Bulkeley & Betsill, 2013:144). The implication of this problem is arguably also related to how climate change is conceptualized and framed. The second notion is that this problem is not necessarily general or comparable across cities. U.S. cities are more jurisdictionally fragmented due to other structural conditions than is the case of European cities (Skelcher, 2007).

The second issue is the question of authority, which arises as a consequence of city governments being the governing entity. In contrast to fragmented physical jurisdictions, the question of authority implies that there are some sectors or policy areas where the city government has no influence. To begin where the last paragraph ended, city governments across counties have a highly variable level of influence over climate change planning, because of variation in authority. City has to a varying degree limited influence on important climate related sectors such as energy production, supply and management, transport, infrastructure, land-use planning, environmental taxation, water, and waste management (Berkeley, 2011). In the case of New York City it is specially within areas such as energy production and distribution, transport related to subway and trains, port management, and public housing, where the city has little formal authority (New York City, 2011, 2013a, 2015a). In any case, the lack of authority implies that “urban and regional responses to climate change are frequently constrained by their governance capacities in these critical areas” (Berkeley, 2011:467).

Berkeley (2011) as a consequence finds that cities traditionally have focused on community scale initiatives, retrofits in commercial and municipal buildings, increasing the number of hybrid cars, encourage alternatives to private cars, and promote the use of small scale renewable energy. The case study highlights the lack of formal influence of the city government in terms of energy distribution,

during the Storm Hardening and Resiliency Collaborative initiative. Here all the formal authority is in the hands of the State of New York Public Service Commission. This case study does only to a limited degree highlight the extent of the issue of authority, because it only analyses initiatives that are being implemented. The highest profiled initiative that failed in New York City is the congestion-pricing proposal by the Michael Bloomberg government, which the state legislature defeated. The proposal was designed to increase spending on mass transit and reduce motor vehicle traffic in New York City (Bulkeley & Betsill, 2013).

New York City (2013b) has called on federal action to solve this problem, as the city cannot achieve deep emission reductions without the creation of an overarching federal framework. Bulkeley & Schroeder (2011) have on the other hand observed another response by city governments. This has been to engage in “various forms of partnership and networking in order both to discharge particular duties and to move beyond the boundaries of their official competencies” (Bulkeley & Schroeder, 2011:752). Hence, public-private collaboration enables more comprehensive responses, which enables the generation of initiatives that are seeking to adapt and mitigate climate change beyond the confines of city government’s authority (Bulkeley, 2011). This is because “there is considerable scope for effective action by municipal governments to reduce local greenhouse gas emissions by informal approaches which do not require formal authority. Many initiatives to address climate change locally have been based on voluntary or additional initiatives, rather than being part of the mainstream council business” (Betsill & Bulkeley, 2005:206). This increased use of informal and extensive collaborative approaches are also reflected in the Newtown Creek Plant initiative where the city enables large-scale renewable energy production without formally having authority within this policy area.

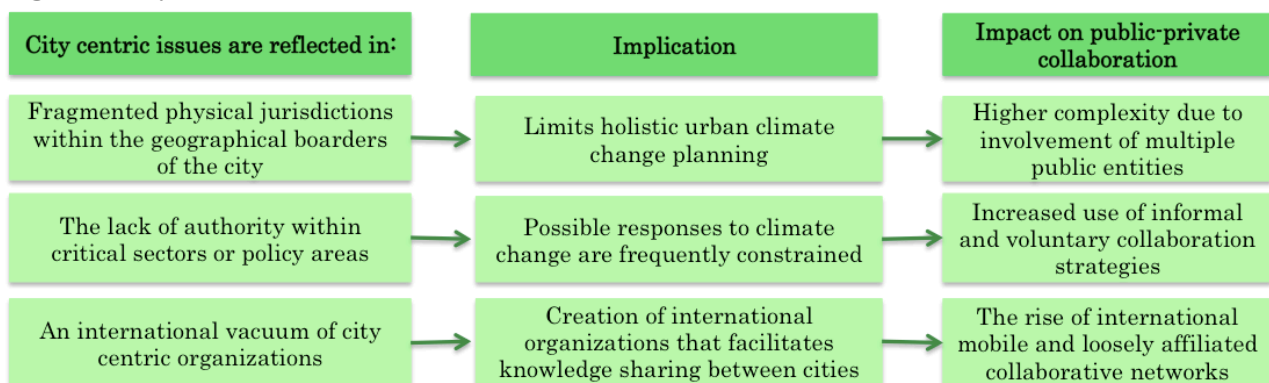
The third issue, related to city centric aspects of climate change planning, is the international organizational vacuum. As the introduction to climate change planning in Chapter 4 highlighted, national governments have for decades had international organizations on climate change planning that facilitates knowledge sharing and collaboration. However, cities were caught in an international organizational vacuum as no international organizations existed.

To fill this international organizational vacuum, cities have created their own city-focused organizations with the same purpose. C40 is probably the most dedicated organizations in this regard. C40 has enabled cities to knowledge share on the many matters that arise when taking on urban climate change planning

as a city, including planning methods and best practice. For this reason C40 has played a critical role in the development and implementation of several cities' climate change policy (Bulkeley & Schroeder, 2011) Solecki, Patrick & Sprigings (2015) come to a similar conclusion and find that urban climate policy developments have been highly dependent on the international knowledge sharing organizations, which have linked city governments together. As an example they find that New York City through C40 has learned from initiatives implemented in Chicago and London.

The rise of international organizations, for and by city governments, are in it self an important international policy development and have been key in increasing the legitimacy of cities as significant drivers of climate change action. More so, these international city centric organizations have proven to be an important means of translating diverse interests and materials. C40 has focused on bringing together especially the energy efficiency sector including commercial buildings, public housing, energy service companies, major financial institutions, corporate headquarters, and social housing tenants. This has happened through the creation of international mobile and loosely affiliated networks (Bulkeley & Schroeder, 2011:759). Hence, these city centric organizations have brought in the private sector and created what resembles collaborative networks. "These initiatives have been termed governance experiments, signaling both the novelty of the actors and approaches to governing being deployed and the institutional vacuum within which they are emerging. In the broadest sense, processes of globalization can be seen to have led to the fragmentation of political authority" (Bulkeley, 2011:467). Bulkeley & Schroeder (2011) comment on the same development and find that in general global environmental governance is increasingly blurring the divides between public and private. But rather than being a case of city governments giving up discretion, this has become an area of new forms of public-private collaboration and shared discretion.

Figure 9: City Centric – Novel collaboration issues



Partner Issues: Specialist Involvement

The following will discuss an issue within public-private collaboration and climate change planning by cities, which the theoretical framework only to a limited degree analyzes, namely who are the private actors involved in the collaboration. Climate change planning is a knowledge intensive policy realm where governments may lack information or the capabilities to reach the goal. This has arguably lead to an increased involvement of specialists. As the New York City case study points out these are especially researchers from the local universities and specialized nonprofit organizations.

Already with the first PlanNYC from 2007, the involvement of specialists in climate change planning in New York City was initiated. Mayor Michael Bloomberg took the initiative to create the New York City Panel on Climate Change, which is composed of 15 academic experts and scientists from local universities. The task of the panel is to develop a climate change science base to inform the city government, including sea level and temperature trends and scenarios for the city. In relation to nonprofit organizations, which the following will discuss, it should be noted that it is the Rockefeller Foundation that have sponsored the work of the New York City Panel on Climate Change with \$350,000 million (New York City, 2008b). The knowledge generated is the input into yet another expert panel, the Climate Change Adaptation Task Force, which consists of representatives from 19 city government agencies and 15 private corporations (Solecki, Patrick & Sprigings, 2015 and New York City, 2008b). This is perhaps the most extensive and critical role given to the academic community in New York City, but the involvement of scientists was also found in the Storm Hardening and Resiliency Collaborative. In this initiative scientists from city universities were part of the Collaborative and the consensus building on the technical standards and investment plan.

This issue of scientists' involvement was also the focus of Chambliss & Lewenstein (2012) in their case study of the State of New York. Their primary conclusion was that the highly politicized nature of the climate change debate makes the delivery of science-based information challenging. The availability of climate change information addressing local aspects was also very limited. The reason being that "the U.S. does not have top-down science communication policies, as many countries do" (Chambliss & Lewenstein, 2012:1). This may imply that there is a relatively high degree of variation across countries in the involvement of scientist and universities. The involvement of specialists in policy making has also been dealt with by Jenkins-Smith & Sabatier (1994) who through their advocacy coalition framework theorize this development. Similar to the above argument, it highlights how a complicated policymaking

environment consists of advocacy coalition that also can include researchers, produces different interpretations of information, and ultimately can be part of supporting policy changes.

The implication of the widespread use of specialists is that their research shapes the understanding of the goal itself and necessary means by which the goal is achieved. Hence, they gain preference discretion. "The New York City Panel on Climate Change will shape innovative approaches to cope with global warming's potentially devastating consequences and model the kind of planning which can and should be applied in cities around the world" (New York City, 2008:1). Rosenzweig & Solecki (2011) who by the way both co-chair the New York City Panel on Climate Change, find that the involvement of this panel and of the scientific community more generally implies that climate change planning in New York City is characterized by a "multi-jurisdictional stakeholder-scientist process, state-of-the-art scientific projections and mapping, and development of adaptation strategies based on a risk-management approach" (Rosenzweig & Solecki, 2011:97). A complementary analysis argues that rather than identifying shifts in discretion between government and specialists, what is occurring in urban climate change planning is the constitution of new forms of public and private authority (Bulkeley & Schroeder, 2011). This development is also suggested by Solecki, Patrick & Sprigings (2015) who find that the complex interactions of government and the scientific community plays a critical role in problem identification, prioritization, innovating policy, and ultimately pushing climate change policies.

Another group of specialists involved in climate change planning in New York City are the nonprofit organizations. These were the primary private actor in both MillionTreesNYC and the High Line Park, and were heavily involved in the Retrofit Accelerator, the East Side Coastal Resiliency Project, and the Storm Hardening and Resiliency Collaborative. The kinds of nonprofit organizations vary from environmental advocate organizations to philanthropic organizations. Common for all of them is that they are specialist in their field and highly professionalized.

Bulkeley & Schroeder (2011) have observed how this set of actors, have taken on more traditional state functions and suggest that nonprofit organizations "act as 'diplomats', and 'perform many of the same functions as state delegates: they represent the interests of their constituencies, they engage in information exchange, they negotiate, and they provide policy advice" (Bulkeley & Schroeder, 2011:746). That the increased use of nonprofit organizations shapes the roles and tasks that these actors takes on is by Skelcher & Smith (2015) referred to a hybridity. Hence, new complex organizational forms and

functions can arise due to changes in external environments, for instance government knowledge needs. Nonprofit organizations have arguably also developed a form of innovative philanthropy, where it perceives itself as a kind of research and development institutions. The Rockefeller Foundation and Bloomberg Philanthropies are examples here of (Freedman Consulting, 2013). The New York City case study does also showcase how nonprofit organizations have become deeper involved in either the resource aspect or as the implementing partner in a public-private collaboration.

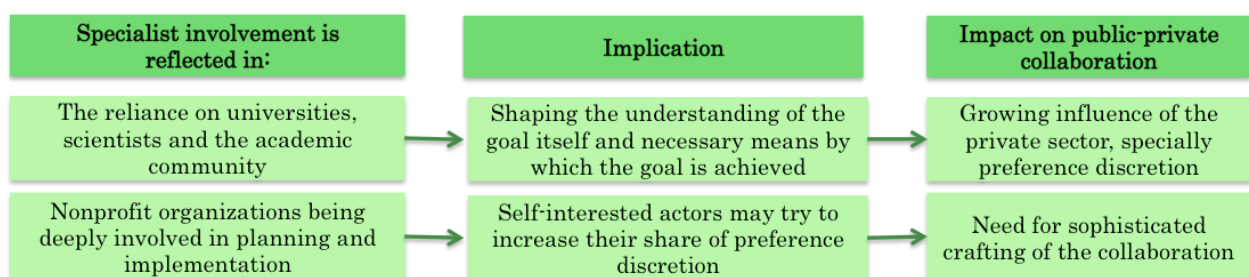
In contrast to profit seeking private actors, the nonprofit organizations have a different, and in some instances, more multifaceted *modus operandi*. “Collaborators are likely to tilt payoffs toward themselves whenever they can. Any private organization, whether for-profit or nonprofit, has stakeholders with their own particular interests, and government would be foolish not to anticipate that its private collaborators will tend to serve such interests, even at the expense of the government’s priorities, to the extent that they are able” (Donahue & Zeckhauser, 2011:53). The difference is that issue of preference discretion arises more commonly with nonprofit organization than with profit seeking actors. This is arguably because nonprofit organizations tend to have particular interests in policies or goals, in contrast to a profit seeking actors where economic payoff discretion tend to be a bigger focal point. Amirkhanyan & Pettijohn (2012) do in their study of nonprofit perspectives on public-private collaboration also focus on the discretionary power of nonprofits. In contrast to Donahue & Zeckhauser (2011), they find that government structures and bureaucracy limit the ability of nonprofits to exercise discretion. In line with Bulkeley & Schroeder (2011) they do, however, find the consequence to be that nonprofit organizations to an increasing degree are becoming agents of governments.

It is precisely also the structure of discretion within a collaboration that possibly can increase the legitimacy of an outcome or goal, but there is also a risk of the opposite (Donahue & Zeckhauser, 2011). According to Brinkenhoff (2007) allowing too much preference discretion can undermine governance legitimacy and democratic accountability. As is the case of climate change planning, where many collaboration strategies are relatively new, the absence of generally accepted structures can result in “designs tailored to specific circumstances, yielding problematic results for legitimacy, consent and accountability” (Brinkenhoff, 2007:75). This is in itself highly influential to public-private collaboration, but it may also spur city governments to change collaboration strategies. According to Donahue & Zeckhauser (2011) the first option is to squeeze discretion out of the collaboration, by focusing more on contract oriented strategies. The second approach generally calls for sophisticated skills in crafting the

structure of the collaboration and finding ways to make private discretion more productive and less risky. This case study suggest that New York City has chosen the second option, as findings suggest that it has engaged in trust-based forms of collaboration and the use of strategic partnerships.

Whether this is actually a novel collaboration issue of this policy realm can be questioned, as national governments are likely to have similar challenges within climate change planning and in other areas where nonprofit organizations are possible collaborative partner. However, there may be a difference in the pressure city governments face compared to national governments. Because as Bloomberg (2015) argues “climate change calls on societies to act quickly, and cities tend to be more nimble than national governments, which are more likely to be captured or neutralized by special interest groups and which tend to view problems through an ideological, rather than a pragmatic, lens” (Bloomberg, 2015:118).

Figure 10: Specialists Involvement– Novel collaboration issues



Movement within Collaboration Strategies

As argued by these discussions there are trends and novel collaborations issues, which are distinct to public private collaboration in climate change planning by cities. Against this background this thesis finds that a movement towards ‘comprehensive climate cooperatives’ is occurring. This is not a specific new collaboration strategy, but a movement within the form, structure and features of public-private collaboration strategies specific to climate change planning by cities.

The discussions on novel collaboration issues showcase a variety of implications, which can be boiled down to two overall findings. The first being that private collaborative partners are becoming more critical to reach public policy goals, due to the complexities of climate change planning. This subsequently influences discretion of collaborative partners, which in climate change planning includes both profit seeking companies, nonprofit organizations and universities. Secondly, the discussion highlight how intelligently crafted mixed types of collaboration strategies are being used to cope with these complexities. These also include more informal collaborations and changes in the role of actors.

The subsection on case findings also highlighted trends within public-private collaboration used in climate changes planning by cities. In brief these include the relative frequent occurrence of resource and legitimacy motivations, the growing role of innovation motivation, and efficiency arguments based on vital data and technical know-how held by the private sector. Additionally, there was a trend to widespread use of collaborative networks and elements of strategic partnerships, even when this strategy was not the primary one.

In combination these trends and the impacts of the novel collaboration issues makes up what this thesis denotes ‘comprehensive climate cooperatives’, which is a movement within public private collaboration in climate change planning by cities. This movement towards comprehensive climate cooperatives refers to the increased mix of strategic partnership elements and use governance networks within climate change planning by cities. Public-private collaboration is in this regard to an increasing degree stressing the critical need for collaboration and the joint benefits hereof. More so, the public-private collaboration is increasingly extensive with more shared discretion, jointly developed and controlled initiatives, where ownership and roles within the collaboration is changing. Roles changing toward governments being environmental advocates and private partners taking on leadership responsibilities. Legitimacy and resource needs are reflected in the increased involvement of new partners, especially powerful nonprofit organizations. In general “what is apparent from the New York City experience is that public-private partnerships can take on many forms and respond to myriad challenges. Private involvement can begin with philanthropic or corporate financing, but can extend much further, to include co-ownership and implementation of projects that serve private and civic needs alike” (Freedman Consulting, 2013:6).

As a final note the discussion also makes it evident that government motivation is not the only mechanism that influences the use of collaboration strategies. So while findings still suggest that the four types of government motivation have a causal effect, this discussion also implies that collaboration strategies are influenced by other explanatory mechanisms. These include degree of local authority, how climate change planning is framed and international city centric organizations. Some of these mechanisms interestingly overlap with what Betsill & Bulkeley (2005) finds in general to drive cities to engage in climate change planning. These were namely 1) the presence of a committed individual with institutional support; 2) the availability of funding; 3) the extent of local powers over transport, energy, and planning; 4) how climate change is framed in relation to economic objectives; and 5) the political will to act.

CHAPTER 6: CONCLUSION

Conclusions

This thesis was inspired by Michael Bloomberg and his approach to climate change action, which emphasizes cities are the new drives of climate change action and the advantages of collaborating with the private sector. Against this background, this thesis set out to investigate the use of public-private collaboration in climate change planning by cities. The research question therefore was: *How do city government motivations to engage in public-private collaboration when implementing climate change plans influence the use of collaboration strategies?*

To answer this research question a theoretical framework was developed. The theoretical framework hypothesized four types of government motivations and six associated collaboration strategies. Subsequently, a research design based on a case study of New York City was selected as the empirical foundation for the analysis. Eight initiatives from PlaNYC were analyzed to explore if the theoretical framework also was relevant when used to analyze public-private collaboration within a new policy realm. This analysis furthermore enabled this thesis to investigate trends within both government motivations and collaboration strategies used in climate change planning by cities. The case study also highlighted novel collaboration issues, which arguably also influence public-private collaboration.

The fundamental purpose of this thesis has been to answer the research question of *how* government motivations influence public-private collaboration and collaboration strategies. The conclusion is that city government motivations influence the *form* of the collaboration strategy used. *Form* referring to features such as the sharing of discretion, the degree of contract orientation and formal structures, and partner selection. In the analysis six forms of collaboration strategies were established, each of these with their own form. As the analysis highlights the six strategies are simplified and standardized, but in reality a collaboration strategy can be mixed and features can be tweaked or pulled in various directions.

Based on the case findings this thesis included four additional central conclusions. These either inform or elaborate the above answer the research question.

1. The case findings overall support the applicability of the theoretical framework. In fact, within all eight analyzed initiatives government motivation and the use of collaboration strategy followed the association set out in the theoretical framework. So even though the theoretical framework was not

developed based on theory linked to climate change planning by cities, it was found also to be relevant within this policy realm.

2. The case findings furthermore supports that government motivations do have a causal effect on the use of public-private collaboration strategies. Consequently government motivations are established as a probable explanatory mechanism, with collaboration strategies being the observed outcome.
3. In relation to government motivations, this thesis finds that dual government motivations can also be in play, either simultaneously or successively. Trends within government motivations include the relative frequent occurrence of resource and legitimacy motivations and the growing role of innovation motivation. This case study also suggests that there is a tendency for efficiency motivation to primarily be a result of lack of specialized information and knowledge within government.
4. In regards to the use of collaboration strategies, the case study findings also imply that collaboration strategies, like procurement of contracts and joint venturing, are not irrelevant when city governments undertake climate change planning, but there is a tendency to use collaboration strategies where private actors are more operationally autonomous and where trust, mutuality, and dialogue is more dominant. Hence, collaboration strategies like collaborative networks and strategic partnerships were more widely used within this policy realm. More so, the case findings also suggest the use of mixed strategies and especially elements of strategic partnerships were discovered in several collaborations.

The case study and discussion also investigates potentially explanatory mechanisms that influence the use of public-private collaboration, specifically in climate change planning by cities. The fact that this case study suggests that there are issues, which the theoretical framework did not anticipate, is another important conclusion of this thesis. The issues highlighted were the impacts of climate change being a wicked policy problem, the differences in jurisdictional and authoritative structures, and the involvement of specialists. This thesis concludes that these have lead to two overall developments.

1. Private collaborative partners are becoming more critical to reach public policy goals, due to the complexities of climate change planning. This influences the form of the collaboration and specially discretion of the private collaborative partners. More so, the partners to an increasing degree include also nonprofit organizations and universities.

2. More extensive and mixed types of collaboration strategies are being developed to cope with these complexities and this changes the role of actors within the collaboration.

This thesis subsequently concludes that in combination the trends within government motivations and collaboration strategies and the impacts of the novel collaboration issues make up a movement towards 'comprehensive climate cooperatives' with public-private collaboration in climate change planning by cities.

The critical realist philosophy of science and the subsequent research design enabled this thesis to focus one explanatory mechanism, government motivations. As Easton (2010) states a single case study offers the opportunity to understand a phenomenon in depth and comprehensively. The discussion of novel collaboration issues, however, did highlight the limits of the research design, by making it evident that other mechanisms may also influence public-private collaboration and the form and features of collaboration strategies. This analysis is due to the case study method unable to investigate if government motivations are actually the prevailing explanatory mechanism influencing public-private collaboration in climate change planning by cities.

Another consequence of the research design is that the case findings are based on a single case study of New York City. Analytic generalization is the guiding principle that guides the extent to which the findings and conclusions of this thesis can be extended to other cases of climate change planning by cities. Analytical generalization involves estimating the specific case study context and the degree of circumstantial similarities with other cases. Throughout the analysis and discussion some specific issues concerning New York City and the U.S. versus European cities have been noted. For instance this was the case with the privatization of the energy sector, public opinion on government size, and the degrees of fragmented jurisdictions. Other instances where the context of New York City is different from other large cities possibly include the urgency of the agenda due to Hurricane Sandy, the high density of economic activity and people in the city, and the high profiled interest New York City enjoys from for instance the private sector. However, there is little to suggest that the motivations of the New York City government are fundamentally different than in other cities. Bulkeley & Schroeder (2011) do note that overall motivation to undertake climate change planning to some degree is produced through the contested development of plans and initiatives. However, this is not directly related to the types of motivations. Therefore the central conclusion of this thesis is likely to also apply to other large cities,

namely that city government motivations to engage in public-private collaboration influence the form of collaboration strategies.

As some of the trends and novel collaboration issues highlighted by this thesis are more contextualized, these are more likely to be confined to this specific case study. However, as New York City was selected in part because it is a frontrunner and first mover in climate change planning, it is not unlikely that the trends and the movement towards comprehensive climate cooperatives is, or will be, observable in other cities as well. On key argument here is that “as climate change becomes a more mainstream part of the conversation, the early investors in shaping policy on a local and international scale via policy networks are likely to continue to lead” (Jones, 2013:1513).

This implies that some degree of analytic generalization of the New York City findings are likely to be possible, as this refers to “the extraction of a more abstract level of ideas from a set of case study findings — ideas that nevertheless can pertain to newer situations other than the case(s) in the original case study” (Yin, 2013:325). To strengthen the findings of this thesis, a more compressive data foundation would have been beneficial. Hundreds of PlaNYC initiatives have not been analyzed and tens of cities with highly ambitious climate change plans could be analyzed. This would strengthen the conclusion of this thesis and enable a better understanding of the generalizability.

Implication of the Conclusions

The above conclusions have both theoretical and real-world implications. The theoretical implications that will be highlighted here are related to the need to further develop the theoretical framework to evaluate and also include an investigation of other potentially explanatory mechanisms. A real-world implication highlighted is related to the importance of wisely crafted collaborations in the light of the movements within collaboration strategies.

As concluded, the theoretical framework, based on exciting theory within public-private collaboration, was found relevant also when analyzing climate change planning by cities. Theoretical development or the development of a more comprehensive framework will nonetheless be appropriate. This would enable a more thorough understanding of how other explanatory mechanisms, more specific to climate change planning by cities, also influence collaboration strategies. Inspiration to the identification of additional explanatory mechanisms could stem from the novel collaboration issues identified in this

paper. Additionally, it could be potentially beneficial to test some of the explanatory mechanism, which the urban climate change literature identifies as overall drivers of the policy realm. Betsill & Bulkeley (2005) for instance note that the presence of a committed individual with institutional support and the political will to act by a city government are powerful drivers of climate change action. This would also allow an investigation of the role of Michael Bloomberg in the collaboration strategies used in New York City. A more extensive data set and statistical analysis would also be desirable as to elaborate on the relative strength of the different explanatory mechanisms.

A key real-world implication, especially based on the movement towards comprehensive climate cooperatives, is a growing degree of complexity within the crafting of collaborations. The experience of the New York City governments further emphasizes the importance of not being afraid of experimenting with new collaboration forms, and acknowledges that governments are embedded in a broader community of stakeholders and private actors (Freedman Consulting, 2013). This thesis does in this regard confirm the point of Donahue & Zeckhauser (2011) who find that the critical collaboration question concerns how discretion is shared, and that creating public value requires a careful balancing of benefits and costs. “Picking the right delivery model for each public mission is a crucial prerequisite to effective performance” (Donahue & Zeckhauser, 2011:27).

This does in turn imply that the success of climate change planning involving public-private collaboration does depend on how these collaborations are crafted. This is not only in New York City, but also for other city governments that are involved in climate change planning. The implication is that city governments would stand to benefit from studying successful forms of collaboration and understand how best to adapt these to their own city context.

Future research

As the literature review made evident, there are very few studies that combines public-private collaboration and climate change planning by cities. This thesis have only scratched the surface of what could be investigated in terms of government motivations and its causal effect on collaboration strategies, and let alone the many other mechanisms, tendencies, features and novel collaboration issues this thesis have discussed. This necessity is also underlined by Bulkeley, Broto & Edwards (2012) who find that “it is evident that the politics of low carbon urbanism is now taking place in a greater range and diversity of cities than those that took part in initial responses to the climate change agenda. However,

our knowledge about why and how different approaches to addressing climate change are successful is still based on a small set of case studies and primarily from cities in more developed economies” (Bulkeley, Broto & Edwards, 2012:550).

There are specifically two areas of future research which to a very limited degree have been touched upon by this thesis, which are likely to be important in shaping the future understanding of public-private collaboration in climate change planning by cities. The first is the growing international collaboration between cities. As the thesis and academic literature suggest city centric international organizations are becoming principal for knowledge sharing, best practice exchanges, and exhibiting political leadership. Bulkeley (2015) and Bulkeley & Betsill (2013) also note how the formation of transnational networks between cities has created complex vertical linkages and new political spaces. The multilevel governance approach has in this regard been proposed as to consider the horizontal city-to-city influences on climate action. Theories related to policy learning and how ideas travel and materialize may also be insightful.

The second avenue of future research this thesis conclusively will highlight, is an investigation of the ability of city governments to choose collaboration strategies associated with their motives. This thesis highlights how city governments *engage* in public-private collaboration and *use* collaboration strategies, but to what degree is it a deliberate choice? Is it pure luck, path dependency, intuition, crafting skills, political priorities, experience or totally unique to New York City, that the government manages to use the theoretically associated collaborations strategies? Donahue & Zeckhauser (2011) in this regard argue that “collaborative governance is often an improvised, ad hoc affair, cob-bled together by creative practitioners on a trial-and-error basis” (Donahue & Zeckhauser, 2011:18). As stressed in the above real-world implication “the increasing importance and subtlety of private roles in public ventures mean that orchestrating collaboration, as opposed to managing agencies, will be a core competency for public managers” (Donahue & Zeckhauser 2011:27). Investigating how city governments determine their use of collaboration strategies are therefore likely to be even more relevant to understand the successful crafting of public-private collaboration in climate change planning by cities.

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APPENDIX

Appendix 1: Introduction to PlaNYC 2007

OUR PLAN



This effort began more than a year ago as an attempt to develop a strategy for managing the city's growing needs within a limited amount of land. It quickly became clear that this narrow focus was insufficient. The scale, intricacy, and interdependency of the physical challenges we face required a more holistic approach; choices in one area had unavoidable impacts in another. Each problem in isolation had many possible solutions. But to develop a plan that was not only comprehensive, but also coherent, we realized that we had to think more broadly.

If you seek to solve traffic congestion by building more roads or by expanding mass transit, you make a choice that changes the city. If you care about reducing carbon emissions, that suggests some energy solutions rather than others. If your concern is not only the amount of housing that is produced, but how it impacts neighborhoods and who can afford it, then your recommendations will vary.

That is why in searching for answers, we have wrestled not only with the physical constraints New York will face over two decades, but also with the fundamental values implicit in those policy choices. We have taken as a basic value that economic opportunity can and must come out of growth; that diversity of all kinds can and must be preserved; that a healthy environment is not a luxury good, but a fundamental right essential to creating a city that is fair, healthy, and sustainable.

We have also considered that the world is a different place today than it was half a century ago. Our competition today is no longer only cities like Chicago and Los Angeles—it's also London and

Shanghai. Cities around the world are pushing themselves to become more convenient and enjoyable, without sacrificing excitement or energy. In order to compete in the 21st century economy, we must not only keep up with the innovations of others, but surpass them.

We have not done this work alone. The Mayor's Sustainability Advisory Board, composed of some of the city's leading environmental, business, community, and legislative leaders, has helped us at every step. We have worked with scientists and professors at the Earth Institute at Columbia University, New York University, the City University of New York, and elsewhere to understand the policy history, the economics, and the science behind the issues addressed here. And, over three months from December through March, we reached out further.

What kind of city should we become? We posed that question to New York. Over the past three months, we have received thousands of ideas sent by email through our website; we've heard from over a thousand citizens, community leaders and advocates who came to our meetings to express their opinions; we have met with over 100 advocates and community organizations, held 11 Town Hall meetings, and delivered presentations around the city. The input we received suggested new ideas for consideration, shaped our thinking, reordered our priorities.

In all our conversations, one core emerged: the strengths of the city are in concentration, efficiency, density, diversity; in its people, but above all in its unending sense of possibility. We must reinforce these strengths.

The result, we believe, is the most sweeping plan to strengthen New York's urban environment in the city's modern history. Focusing on the five key dimensions of the city's environment—land, air, water, energy, and transportation—**we have developed a plan that can become a model for cities in the 21st century.**

The plan outlined here shows how using our land more efficiently can enable the city to absorb tremendous growth while creating affordable, sustainable housing and open spaces in every neighborhood. It details initiatives to improve the quality of our air across the city, so that every New Yorker can depend on breathing the cleanest air of any big city in America; it specifies the actions we need to take to protect the purity of our water and ensure its reliable supply throughout the city; it proposes a new approach to energy planning in New York, that won't only meet the city's reliability needs, but will improve our air quality and save us billions of dollars every year. Finally, it proposes to transform our transportation network on a scale not seen since the expansion of the subway system in the early 20th century—and fund it.

Each strategy builds on another. For example, encouraging transit-oriented growth is not only a housing strategy; it will also reduce our dependence on automobiles, which in turn alleviates congestion and improves our air quality.

We have also discovered that every smart choice equals one ultimate impact: a reduction in global warming emissions. This is the real fight to preserve and sustain our city, in the most literal sense.

The answers are neither easy nor painless.

They will require not only substantial resources but deep reservoirs of will.

In some cases, the key difficulties are administrative; we must achieve a new level of collaboration between City agencies and among our partners in the region. In others, the challenges are legislative. This plan calls for changes at the City, State, and Federal levels—for transportation funding, for energy reform, for a national or state greenhouse gas policy.

Finally, there is the need to pay for what we want. Previous generations of New Yorkers have ignored the reality of financing and have suffered as a result. We cannot make that mistake again. For each of our proposals in this plan, we have described how it will be funded, which in some cases is through the city budget, in other cases through new funding sources. An underlying assumption has been that we should be willing to invest in things that we truly need, and which will pay New Yorkers back many times.

The growth that prompted this effort in the first place will also enable us to pay for many of the answers. By guiding and shaping this growth, we believe it can be harnessed to make a city of 9.1 million people easier, more beautiful, healthier, and more fair than our city of 8.2 million today.

In December, we posed another question to New York: **Will you still love New York in 2030?**

Above all, this report seeks to ensure that the answer to that question is an unequivocal, **Yes.**



Land

- Create homes for almost a million more New Yorkers, while making housing more affordable and sustainable
- Ensure that all New Yorkers live within a 10-minute walk of a park
- Clean up all contaminated land in New York City

As virtually every part of our city grows, one piece remains fixed: the supply of land. That's why we must use our space more efficiently, to accommodate growth while preserving, and enhancing, the city's quality of life.

Housing

To meet the needs of a growing population, we'll need 265,000 more housing units by 2030. We have the capacity to accommodate this growth, but without action our city's housing stock won't be as affordable or sustainable as it should be.

That's why we will **expand our supply potential by 300,000 to 500,000 units** to drive down the price of land, while directing growth toward areas served by public transportation. This **transit-oriented development** will be supported by public actions to create new opportunities for housing, such as **ambitious rezonings** in consultation with local communities, **maximizing the efficiency of government-owned sites**, and exploring opportunities with communities to **create new land** by decking over highways and railyards.

We must also pair these actions with targeted affordability strategies like **creative financing**, expanding the use of **inclusionary zoning**, and developing **homeownership programs** for low-income New Yorkers.

By expanding these efforts into the future, we can ensure that new housing production matches our vision of New York as a city of opportunity for all.

Open Space

Although we've added more than 300 acres of parks in the last five years and set in motion much more, two million New Yorkers, including hundreds of thousands of children, live more than 10 minutes from a park.

That's why we will invest in **new recreational facilities** across every borough, **opening hundreds of schoolyards** as local playgrounds, **reclaiming underdeveloped sites** that were designated as parks but never

finished, and **expanding usable hours at existing fields** by installing additional lights and turf fields.

We will improve our streets and sidewalks by adding **new greenstreets** and **public plazas in every community** as part of our strategy to create a more inviting public realm.

Brownfields

Our need for land means that we must foster the reuse of sites where previous uses have left behind a legacy of contamination.

That's why we will make existing brown-field cleanup programs faster, more efficient, and more responsive to New York's unique development challenges. We will develop **city-specific remediation guidelines**, **pilot new time-saving strategies** for testing, and create a **new City brownfields office** to accelerate redevelopment.

We will advocate for **eligibility criteria expansions** for existing State programs, while creating a **new City program** to oversee the remaining sites. We will ask for the State to **release community development grants** and **incentivize developers to partner with local communities so neighborhoods gain** a stronger voice in shaping the direction of their neighborhoods.

But we can't clean up all the contaminated land in the city if we don't know where it is. That's why we will launch a process to **identify contaminated sites**.

To encourage more widespread testing, we will **create a revolving cleanup fund**, funded through a partnership with the private sector.

Our approach to brownfields will be more comprehensive and inclusive than ever before, as we work to ensure that the remnants of our past contribute to a more sustainable future.



Water

- Open 90% of our waterways for recreation by reducing water pollution and preserving our natural areas
- Develop critical backup systems for our aging water network to ensure long-term reliability

We have two primary water challenges: to ensure the water we drink is pure and reliable, and to ensure that the waterways surrounding our city are clean and available for use by New Yorkers.

Water Network

We have the luxury of an abundant water supply, but our supply system faces challenges. Critical elements such as aqueducts and water tunnels cannot be taken out of service. Development encroaches on the city's watersheds, so our reservoirs will require continued vigilance.

We must ensure the quality of our water at its source by **building a new filtration plant for the Croton System** and continuing our aggressive **watershed protection program** for the Catskill and Delaware systems.

We will create redundancy for the aqueducts that carry the water to the city through a combination of **water conservation measures**, maximizing the use of our existing supplies through **new infrastructure like the New Croton Aqueduct**, and **evaluating new potential water sources**, like groundwater.

Finally, we must be able to repair and modernize our in-city distribution, which means **finishing Water Tunnel No. 3**.

Water Quality

We are one of the world's great waterfront cities, with nearly 600 miles of coastline. Waterfront revitalization has been a guiding principle of the last five years, across all five boroughs.

Now it is time to accelerate the reclamation of the waterways themselves, particularly our most polluted tributaries. We will **upgrade our wastewater treatment infrastructure**, while we implement proven strategies such as **greening our streets**, **planting trees** and **expanding our Bluebelt network**. We will also **explore other natural solutions** for cleaning our water bodies through a range of pilot programs that will be coordinated by a **new Interagency Best Management Practices Task Force**. We will also **begin to assess the protection our wetlands receive—our first step toward a broader policy**.

Through these initiatives, we can restore our city's natural ecology and the recreational use of our waterways.



Transportation

- **Improve travel times by adding transit capacity for millions more residents, visitors, and workers**
- **Reach a full “state of good repair” on New York City’s roads, subways, and rails for the first time in history**

New York’s success has always been driven by the efficiency and scale of its transportation network. But for the last 50 years, New York has underinvested.

Despite dramatic progress, we have not yet achieved a full state of good repair across our transit and road networks. More significantly, virtually all subway routes, river crossings, and commuter rail lines will be pushed beyond their capacity in the coming decades—making transportation our greatest potential barrier to growth.

We are proposing a **sweeping transportation plan** that will enable us to meet our needs through 2030 and beyond. That includes strategies to **improve our transit network**, through **major infrastructure expansions, improved bus service, an expanded ferry system** and the **completion of our bike master plan**. We must also **reduce growing gridlock** on our roads through **better road management** and **congestion pricing**, a proven strategy that charges drivers a daily fee to use the city’s densest business district.

We know what must be done. But essential transit expansions have been stalled, in some cases for decades. Today, not a single major expansion project is fully funded—and overall, there is a \$30 billion funding gap.

That’s why we will seek to create a **new regional financing entity, the SMART Financing Authority**, that will rely on three funding streams: the revenues from congestion pricing and an **unprecedented commitment from New York City** that we will **ask New York State to match**. This authority would **fill the existing funding gap for critical transit expansions and provide one-time grants to achieve a state of good repair**, enabling our region to achieve a new standard of mobility.



Energy

- **Provide cleaner, more reliable power for every New Yorker by upgrading our energy infrastructure**

New Yorkers face rising energy costs, air pollution, and greenhouse gas emissions from a lack of coordinated planning, aging infrastructure, and growth.

This will require a two-pronged strategy to increase our clean supply and lower our consumption despite our growth—something that no city or state has done before.

We will **encourage the addition of new, clean power plants through guaranteed contracts, promote repowerings** of our most inefficient plants, and **build a market for renewable energies** to become a bigger source of energy. This new supply will also enable us to **retire our oldest, most polluting power plants**, cleaning our air and reducing greenhouse gas emissions.

To reduce demand, we will **target our largest energy consumers**—institutional buildings, commercial and industrial buildings, and multi-family residential buildings—and accelerate efficiency upgrades **through a system of incentives, mandates, and challenges**. **Demand reductions will help all New Yorkers by lowering energy prices.**

Together, these strategies will produce a reliable, affordable, and environmentally sustainable energy network. But there is currently no entity capable of achieving this goal. That’s why we will work with the State to create a **New York City Energy Planning Board**.

By managing demand and increasing supply, **New York City’s overall power and heating bill will plunge by \$2 billion to \$4 billion**; the average New York household will save an estimated \$230 every year by 2015.

The result will be not only a healthier environment, but also a stronger economy.



Air Quality

- **Achieve the cleanest air quality of any big city in America**

Despite recent improvements, New York City still falls short in meeting federal air quality standards. This is most apparent in the persistently high rates of asthma that plague too many neighborhoods.

We will continue **pressuring the State and Federal governments to require reductions** in harmful emissions, while aggressively targeting the local sources we can control. Transportation is responsible for more than 50% of our local air pollution; that’s why we **will encourage New Yorkers to shift to mass transit**. In addition we will mandate, promote, or incentivize **fuel efficiency, cleaner fuels, cleaner or upgraded engines, and the installation of anti-idling technology**.

We must also address our other major sources of emissions: buildings and power plants. That means switching to **cleaner fuels for heating and retiring polluting plants**.

Our open space initiatives such as **tree plantings** will move us the rest of the way toward achieving the cleanest air of any big city in America.

To track our progress and target our solutions we will also **launch one of the largest local air quality studies in the United States**.



Climate change

- **Reduce our global warming emissions by 30%**

Collectively these initiatives address the greatest challenge of all: global warming. Scientists have predicted that unless greenhouse gas emissions are substantially stemmed by the middle of the century, the impacts of climate change will be irreversible. Coastal cities like New York are especially vulnerable.

Almost every action we take—from turning on the lights to stepping into a car—has an impact on the amount of carbon dioxide (CO₂) released into the atmosphere.

As a result, **our climate change strategy is the sum of all of the initiatives in this plan**. All of PLANYC’s strategies—from reducing the number of cars to building cleaner power plants to addressing the inefficiencies of our buildings—will help us to reduce emissions.

And we will also make a difference in the fight against global warming simply by making our city stronger: **By absorbing 900,000 new residents**—instead of having them live elsewhere in the United States—we **can prevent an additional 15.6 million metric tons of greenhouse gases from being released into the atmosphere**.

We will also embark on a long-term effort to develop a **comprehensive climate change adaptation strategy**, to prepare New York for the climate shifts that are already unavoidable.

Our goals for achieving a greener, greater New York



Housing and Neighborhoods

Create homes for almost a million more New Yorkers while making housing and neighborhoods more affordable and sustainable



Parks and Public Space

Ensure all New Yorkers live within a 10-minute walk of a park



Brownfields

Clean up all contaminated land in New York City



Waterways

Improve the quality of our waterways to increase opportunities for recreation and restore coastal ecosystems



Water Supply

Ensure the high quality and reliability of our water supply system



Transportation

Expand sustainable transportation choices and ensure the reliability and high quality of our transportation network



Energy

Reduce energy consumption and make our energy systems cleaner and more reliable



Air Quality

Achieve the cleanest air quality of any big U.S. city



Solid Waste

Divert 75% of our solid waste from landfills



Climate Change

Reduce greenhouse gas emissions by more than 30%

Increase the resilience of our communities, natural systems, and infrastructure to climate risks



Four years ago we asked what we want our city to look and feel like in 2030.

A growing population, aging infrastructure, a changing climate, and an evolving economy posed challenges to our city's success and quality of life. But we recognized that we will determine our own future by how we respond to and shape these changes with our own actions.

We created PlaNYC as a bold agenda to meet these challenges and build a greener, greater New York.

This effort has yielded tremendous results. In just four years we've added more than 200 acres of parkland while improving our existing parks. We've created or preserved more than 64,000 units of affordable housing. We've provided New Yorkers with more transportation choices. We've enacted ambitious laws to make existing buildings more energy-efficient. And our greenhouse gas emissions have fallen 13% below 2005 levels.

Now we must do more.

Today, we put forward an updated plan that builds upon the progress and lessons of the past four years.

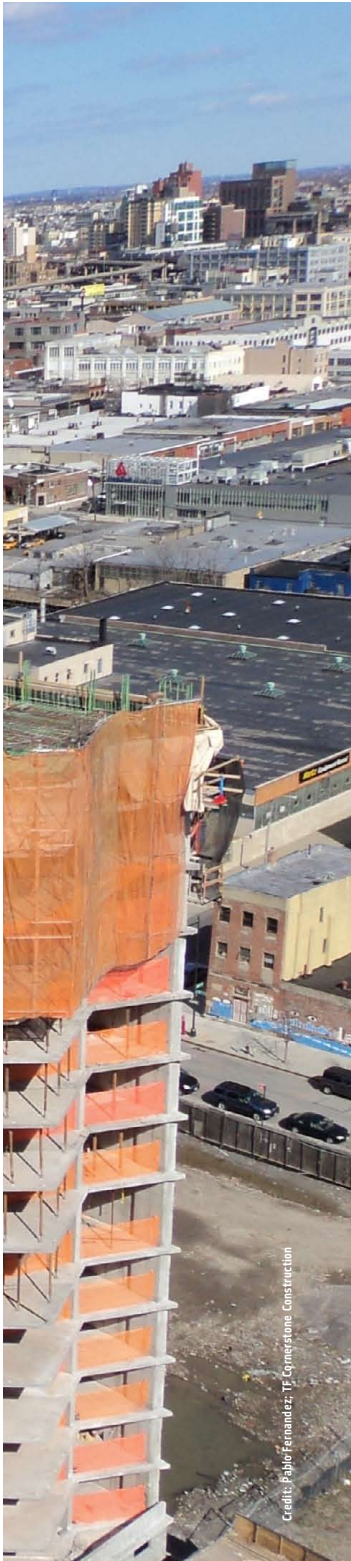
PlaNYC complements other City efforts, such as those we are making on crime, poverty, education, public health, or social services.

The Plan focuses on the physical city, and the functionality of its infrastructure in our everyday lives: housing that is too often too expensive, neighborhoods that need more playgrounds, aged water and power systems overdue for upgrade, congested streets and crowded subways. If these challenges remain unaddressed, we will undermine our economy and our quality of life.

Our city's history teaches us that investing in our future is not a luxury, but an imperative. In the 19th century, innovative and ambitious investments in infrastructure like the Croton water system and the Brooklyn Bridge, plus an unprecedented influx of new people, firmly established New York as the nation's leading city. In ensuing decades, the city's dynamism and ability to reinvent itself, exemplified by new investments in subways, skyscrapers, sanitation, and sewers all propelled New York's status as a global leader in infrastructure and innovation.

That's the story of our city, century after century. Times change, but New York City often leads the change. The key to New York's success has always been our leaders' foresight and courage to boldly meet challenges and capitalize on opportunities.

Those are our aims with PlaNYC.



Credit: Pablo Fernandez, TC Cornerstone Construction

New construction in
Long Island City, Queens

Our Challenges and Opportunities

For New York to thrive, we must accommodate a growing population, invest in and maintain our infrastructure, enhance our economic competitiveness, and improve the quality of our air and water, while reducing our contributions to climate change and preparing for its effects.

Growth

New York City's population is still growing. By 2030 we project that our population will increase to more than 9 million, some newcomers and some who are already here, along with their children and grandchildren.

This growth, if properly planned for, offers tremendous opportunities. New people bring new ideas and innovation to our economy. Growth can enrich our communities and add to the energy and diversity of our city. But unplanned growth—development in places that don't make sense and that out-strips the capacity of public infrastructure—can burden our city and harm everyone's quality of life.

As we plan for a growing population, we must think not just of our quantitative goals but also of our qualitative desires. While we build more capacity in statistical terms like housing units and subway mileage, we must simultaneously realize our task is to preserve and maintain neighborhoods that people want to live in, or where they can start new businesses. As New York City gets bigger, it's up to us to make sure it gets better as well.

Infrastructure

Serving our people, attracting and supporting innovation and entrepreneurs, and preparing our city for the effects of climate change requires a visionary approach to the design, financing, and maintenance of our shared physical space and infrastructure.

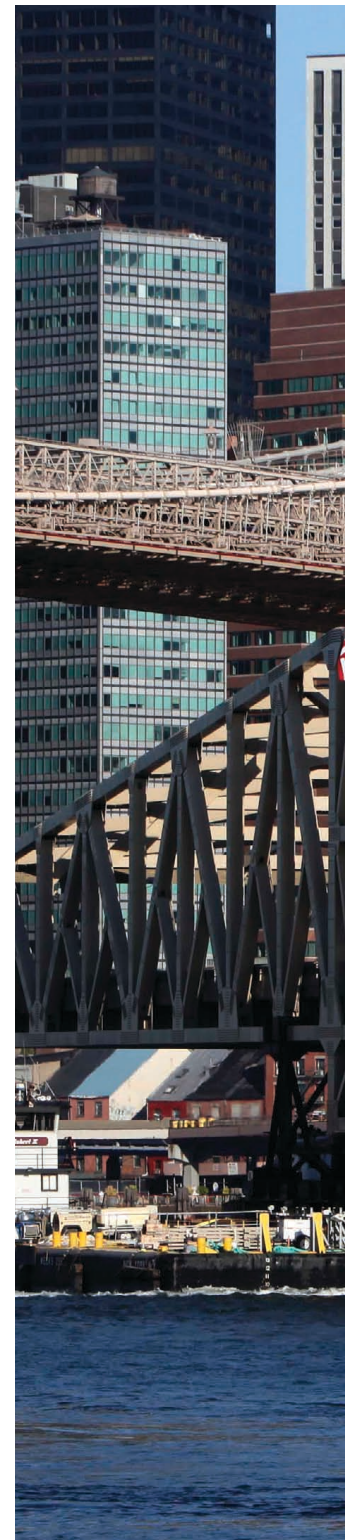
From the subways we ride on, to the pipes that deliver our drinking water, to the power lines that bring electricity into our homes and offices, we rely on an inherited array of invaluable infrastructure to meet our basic needs. The New Yorkers who built these systems looked beyond the short-term and planned for a city that could outlast its challenges and continue to prosper beyond their own lifetimes. We must have equal foresight.

Today, in some respects, we are living on the limits of our inheritance. With ridership at its highest levels in half a century, our subways are increasingly jammed. Our bridges, some over 100 years old, are in need of repair, or even replacement. Our water system, continuously operating since it was first turned on, is leaking and in need of maintenance. Our energy grid, built with the technology and demand assumptions of an earlier era, strains to meet modern needs.

For much of the second half of the 20th century, New York did not take care of what it had inherited. The city was widely believed to be in decline and the City failed to adequately invest in new infrastructure or maintain the existing assets we depend upon. We have learned that prophecies of decline can be self-fulfilling and so, despite the recession, we have chosen to renew our investment in our civic assets in order to increase opportunities and build a greater city now and for the future.

New Yorkers deserve to be able to turn the tap and have pure water come out, and flip a switch and be confident the lights will come on. They deserve to ride a frequent, reliable subway, the ability to stroll to a nearby park, or safely walk their children to school without the hazards of traffic. They deserve to live in the greener, greater New York that is the goal of PlaNYC.

The new Willis Avenue Bridge
being transported up the East River





Credit: NYC Economic Development Corporation

A Global Economy

New York has always been a place of promise and possibility, a place where people go in search of a better life. The millions who come to our city arrive with the capacity for hope and hard work.

And, as a result of their efforts, New York City has become an epicenter of global commerce, attracting the best talent from around the world.

New York can still attract talent and the prosperity that comes with it. But today's mobility of people and capital has created a fierce competition among cities. We're competing for the best ideas and the most capable and highly-trained workforce. To thrive economically, we must create a setting where talented entrepreneurs—and the businesses they grow—want to be.

One of the fundamental prerequisites for creating that business climate is functional, cost-effective infrastructure: a transportation system that gets goods to and from market and commuters to and from work efficiently, and energy systems that businesses and households can rely on.

Another of the fundamentals is quality of life, no longer a vague nicety but a tangible feature that business leaders consider when deciding where to locate or expand: where do talented workers want to live, in an age when they can choose to live anywhere? They don't consider great parks or clean air to be a frill.

The economic implications of sustainability become even more important in periods of dynamic change. As technology changes, energy prices fluctuate, and climate conditions change, economic opportunity will come first to those cities that are leading the way to the adoption and commercialization of new services and infrastructure suitable for new conditions. PlaNYC's emphasis on innovation and the application of new techniques to difficult problems will help keep the city's residents and businesses in the role of global economic leaders.

Waterfront parks
ringing Lower Manhattan

A GREENER, GREATER NEW YORK **PLANYC**

9

Climate Change

Our climate is changing. Temperatures are increasing, glaciers are receding, oceans are rising, and storms are intensifying. We must acknowledge the risks posed by climate change and accept our responsibility to address them. This includes our own readiness, guided by science.

Climate change poses acute risks to our city. By 2030, average temperatures could rise by as many as three degrees Fahrenheit in New York City. Hotter temperatures will increase public health risks, particularly for vulnerable populations such as the elderly, and place further strains on our infrastructure. Our city is more affected by rising temperatures than the rest of the region because urban infrastructure absorbs and retains heat. This phenomenon, known as the “urban heat island effect,” can cause temperatures in New York City to be seven degrees Fahrenheit warmer than the surrounding suburbs.

As a city with 520 miles of coastline, we are also at risk of increased flooding as sea levels rise and storms become more intense. Our sea levels have already risen a foot in the last 100 years and are projected to rise by up to 10 inches more in the next two decades. Some of our homes, businesses, and infrastructure like streets and power plants will be further exposed to hazards.

The challenge of climate change for New York City is two-fold; we must reduce our contribution to global warming and we must prepare for its inevitable effects. We are taking steps to address both needs.

New York City already has one of the lowest per capita greenhouse gas (GHG) emissions levels among major global cities, one-third the U.S. average, due to our density and reliance on mass transit. In 2007 we set a goal to reduce our GHG emissions by more than 30% by 2030 compared to 2005 levels. A series of actions have yielded significant progress toward this goal. We also launched a comprehensive effort to understand our climate risks and take concrete actions to reduce the vulnerabilities we identify.

But we must do more if we hope to slow the rate of climate change and protect our city from the changes already occurring.

No city can solve this challenge alone. Nor can any of us afford to wait. New York has always pioneered the development of answers to pressing problems. It is incumbent on us to do so again, rising to the definitive challenge of the 21st century.

Highway flooding from
intense precipitation



Appendix 3: Introduction to PlaNYC 2013

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When Michael R. Bloomberg launched PlaNYC back in 2007, combating climate change was not on the agenda of most municipal governments. Although scientists had shown that human activities were increasing the concentration of greenhouse gases in the earth's atmosphere—and those gases were raising temperatures and sea levels—many people still questioned the very idea of climate change. Besides, what could a single city do about such a global problem?

However, Mayor Bloomberg recognized that this global problem was also a local one. Sea levels around the city already had risen more than a foot during the previous century. Higher sea levels meant coastal storms were more likely to cause flooding, and as a waterfront city with low-lying areas, New York was especially vulnerable to the storms that climate change was expected to bring. Mayor Bloomberg also knew that because of New York City's prominence in the world, it was positioned to take a leadership role on these pressing matters.

The result was PlaNYC, Mayor Bloomberg's pioneering effort to accommodate a growing population, enhance the quality of life for all New Yorkers—and address climate change. A 2007 report entitled *A Greener, Greater New York* laid out PlaNYC's ambitious goals. These included reducing the city's greenhouse gas emissions by more than 30 percent by 2030, and 126 other initiatives that City agencies would undertake to reach these goals, including the establishment of a new Mayor's Office of Long-Term Planning and Sustainability (OLTPS) to lead the effort.

As part of PlaNYC, the Bloomberg Administration sought to understand New York's climate risks. For example, it established the New York City Panel on Climate Change (NPCC), a body of leading climate and social scientists charged with making climate projections for the city—the first group of its kind in the country. OLTPS began working with the Federal Emergency Management Agency to help produce updated Federal flood maps that would provide more

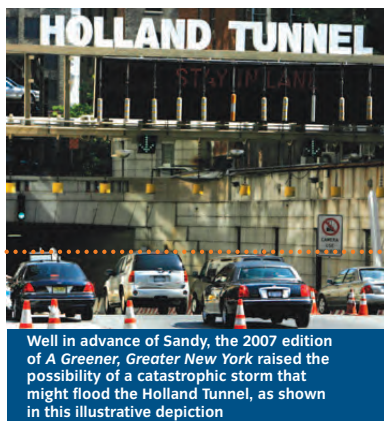
accurate information about New York's risks from coastal storms. In 2011, the City updated *A Greener, Greater New York*, with new initiatives that placed an even greater emphasis on climate resiliency in response to changes in weather that already were taking place.

In ways good and bad, PlaNYC was prescient: Six years on, New York's population is growing rapidly, as is the demand for housing and City services. But PlaNYC also hypothesized storm surges that could overtop the Battery and flood critical infrastructure like the Holland Tunnel. Sandy did that and, tragically for many New Yorkers, much more.

By the time Sandy was forming in distant waters, progress on PlaNYC's resiliency efforts had advanced substantially. Greenhouse gas emissions in New York City were down 16 percent. The City was updating its Building Code to make new buildings more flood-resistant. The Department of Environmental Protection and the Department of Parks & Recreation were restoring and enhancing wetlands. These and many other efforts to prepare our city for a future with climate change were well underway.

On October 29, Sandy hit the city with a force that made two things devastatingly clear. First, New York City had been right to invest in protections against extreme weather. Our resiliency investments performed well during Sandy: recently restored wetlands helped to soak up floodwaters like sponges; new, elevated buildings in inundated areas emerged with significantly less damage; much of the sewer system continued to operate and was restored almost completely within five days of the storm. But Sandy's magnitude, its effects on so many parts of the city, and the threat of ever greater risks from climate change also taught a second lesson: we needed to redouble our efforts.

For this reason, even as the City organized unprecedented relief operations following Sandy, Mayor Bloomberg convened the Special Initiative for Rebuilding and Resiliency (SIRR) and charged it with analyzing the impacts of the





Mayor Michael R. Bloomberg announcing *A Greener, Greater New York* in 2007

storm on the city's buildings, infrastructure, and people; assessing the risks the city faces from climate change in the medium term (2020s) and long term (2050s); and outlining ambitious, comprehensive, but achievable strategies for increasing resiliency citywide. The Mayor also asked SIRR to develop proposals for rebuilding the areas hardest hit

by Sandy—the Brooklyn-Queens Waterfront, the East and South Shores of Staten Island, South Queens, Southern Brooklyn, and Southern Manhattan—to help them to emerge safer, stronger, and better than before.

The result of this effort—and the latest incarnation of PlaNYC—is *A Stronger, More*

Resilient New York. Let others endlessly debate the causes (or even the existence) of climate change. New York City has chosen, once again, to act—by continuing to reduce its contribution to climate change and, at the same time, taking decisive and comprehensive steps to prepare and adapt.

Hurricane Sandy was the worst natural disaster ever to hit New York City. Forty-three New Yorkers lost their lives, many more lost homes or businesses, and entire communities were sent reeling by the storm's devastating impact.

Seven months later, we still have a lot of work to do to help the hardest-hit communities get back on their feet—but there's no question we've come a long way. During tough times, our city always pulls together, and our post-Sandy recovery has been an unprecedented team effort. Thousands of City workers and NYC Service volunteers have put in countless hours cleaning and rebuilding neighborhoods and helping families impacted by the storm, and our Administration has launched innovative new programs to expedite that work. We've also received tremendous help from partners in Federal and State government, from local community leaders, and from nonprofit groups. Private citizens and corporations, from both here in the five boroughs and across the world, have donated nearly \$60 million to the Mayor's Fund to Advance New York City in support of hurricane relief and recovery. Together, we are doing everything possible to help communities rebound and rebuild for the long term.

As our recovery from Sandy continues, we must also look to the future—and prepare for it. The long-term sustainability plan we launched in 2007—PlaNYC—included forward-looking resiliency initiatives that provided important protections during Sandy. But the storm set the bar higher—and as the possibility of more severe weather increases with climate change, we must rise to the occasion.

In December 2012, we announced the formation of the Special Initiative for Rebuilding and Resiliency and charged it with producing a plan to provide additional protection for New York's infrastructure, buildings, and communities from the impacts of climate change. *A Stronger, More Resilient New York*—a roadmap for producing a truly sustainable 21st century New York—is the result of that effort.

It is impossible to know what the future holds for New York. But if this plan is brought to life in the years and decades ahead, a major storm that hits New York will find a much stronger, better protected city.

In our vision of a stronger, more resilient city, many vulnerable neighborhoods will sit behind an array of coastal defenses. Waves rushing toward the coastline will, in some places, be weakened by offshore breakwaters or wetlands, while waves that do reach the shore will find more nourished beaches and dunes that will shield inland communities. In other areas, permanent and temporary floodwalls will hold back rising waters, and storm surge will meet raised and reinforced bulkheads, tide gates, and other coastal protections.

Water that makes its way inland will find hardened and, in some cases, elevated homes, making it more difficult to knock buildings off their foundations or knock out mechanical and electrical systems. And it

will be absorbed by expanded green infrastructure, or diverted into new high-level sewers. Meanwhile, power, liquid fuels, telecommunications, transportation, water and wastewater, healthcare, and other networks will operate largely without interruption, or will return to service quickly when preventative shutdowns or localized interruptions occur.

Of course, if this plan is implemented, New York City will not be “climate-change proof”—an impossible goal—but it will be far safer and more resilient than it is today. While no one can say with certainty exactly how much safer, the climate analysis in Chapter 2 shows that the investments recommended in this plan certainly will be worthwhile. Lives will be saved and many catastrophic losses avoided. For example, while Sandy caused about \$19 billion in losses for our city, rising sea levels and ocean temperatures mean that by the 2050s, a storm like Sandy could cause an estimated \$90 billion in losses (in current dollars)—almost five times as much.

However, if the first phase of coastal protection measures and major power and building protections recommended in this plan are taken into account, the economic outlook changes dramatically. Pursuing just these measures could reduce expected losses in the 2050s by up to 25 percent, or more than \$22 billion. Implementing all of the measures in this plan would result in an even larger reduction, and smart investments by State-led transportation authorities and others could reduce losses further still.

This economic analysis only quantifies the value of losses avoided due to future coastal storms. Our plan will also help avoid losses as a result of other extreme weather events, such as the heavy downpours and heat waves that can cause damage and threaten public health, and which are predicted to grow in intensity as the climate changes.

Over time, implementation of this plan would address many of the risks that a coastal city like New York faces. By hardening our coastline, by making our building stock stronger, by creating a more durable power network and better stormwater infrastructure, and so much more, we can be better prepared for anything the future holds.

We are a coastal city—and we cannot, and will not, abandon our waterfront. Instead, we must build a stronger, more resilient city—and this plan puts us on a path to do just that. It will not be easy, and it will take time; but as New Yorkers we are more than up to the task.

A handwritten signature in black ink, reading "Michael R. Bloomberg". The signature is fluid and cursive, with the first name "Michael" and last name "Bloomberg" clearly legible.

Michael R. Bloomberg
Mayor

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Ten years from now, New York City will enter its fifth century.

As we look ahead, we are asking critical questions about New York: what do we want our city to be in ten years, twenty years, and beyond? What kind of city do we want to pass on to our children—and to the generations to come?

This plan is our roadmap that will preserve and enhance New York City's role as a leading global city. As with past iterations of this report, we focus on economic growth, sustainability, and resiliency. But we also seek to address issues of equity for our residents—because we must serve all New Yorkers.

The bold initiatives we launch in OneNYC will speak to these challenges and articulate the goals and long-term agenda of the de Blasio Administration. They build on previous sustainability plans, as well as on the initiatives we have announced over the past year regarding affordable housing, pre-kindergarten education, the reduction of traffic fatalities, the fight against climate change, bolstering our coastal communities, reducing greenhouse gas emissions, and economic development.

The plan lays down clear markers we will fight for, and sets out a comprehensive blueprint to prepare New York City for the future. We envision a dynamic, thriving economy, a city that is a responsible steward of the environment, and that is resilient against shocks both natural and man-made. We have made equity an explicit guiding principle—a lens through which we view all of our planning, policymaking, and governing. Equity means we ensure that every New Yorker has equal access to opportunities to reach his or her full potential and to succeed.

Our Vision for New York City

We have organized our vision for New York City's fifth century around principles of growth, equity, sustainability, and resiliency.

Our Growing, Thriving City

New York City will continue to be the world's most dynamic urban economy where families, businesses, and neighborhoods thrive.

To meet the needs of a growing population at a time of rising housing costs, the City will implement the nation's most ambitious program for the creation and preservation of affordable housing. The City will support a first-class, 21st century commercial sector. It will foster job growth, and build an inclusive workforce by focusing investment in training in high-growth industries, as well as programs that provide skills to the hardest-to-employ. We will support the burgeoning innovation economy, create new high-speed wireless networks, and invest in transportation infrastructure. As a regional hub, we will work closely with our neighbors on issues including transportation, housing, and jobs.

Our Just and Equitable City

New York City will have an inclusive, equitable economy that offers well-paying jobs and opportunity for all to live with dignity and security.

With the measures in OneNYC, the City will lift 800,000 New Yorkers out of poverty or near poverty by 2025. We will do this by fighting to raise the minimum wage, and launching high-impact initiatives to support education and job growth. We will seek to reduce premature mortality by 25 percent by ensuring that all New Yorkers have access to physical and mental healthcare services and addressing hazards in our homes. We will expand Family Justice Centers to help victims of domestic violence. We will promote the citywide integration of government services, information, and community data.

Our Sustainable City

New York City will be the most sustainable big city in the world and a global leader in the fight against climate change.

We will strive to minimize our environmental footprint, reduce dangerous greenhouse gas emissions, and have the cleanest air and water. The City is building on its goal to reduce greenhouse gases by 80 percent by 2050 (80 x 50)—the largest city in the world to make that commitment—by expanding from an initial focus on buildings to including energy supply, transportation, and solid waste as part of a comprehensive action plan to reach our goal. We are committing to a goal of Zero Waste to landfills by 2030. We will keep organics out of the landfill, which will also cut greenhouse gas emissions. The City will make major investments to remediate contaminated land, and ensure that underserved New Yorkers have more access to parks.

Our Resilient City

Our neighborhoods, economy, and public services are ready to withstand and emerge stronger from the impacts of climate change and other 21st century threats.

As a resilient city, New York will be able to respond to adverse events like Hurricane Sandy, deliver basic functions and services to all residents, and emerge stronger as a community—with the goal of eliminating long-term displacement from homes and jobs after shock events by 2050. The City will upgrade private and public buildings to be more energy efficient and resilient to the impacts of climate change; adapt infrastructure like transportation, telecommunications, water, and energy to withstand severe weather events; and strengthen our coastal defenses against flooding and sea level rise. We will strengthen homes, businesses, community-based organizations, and public services to reduce the impacts of disruptive events and promote faster recovery.

New Challenges

The challenges of our fifth century will be as profound as those we've seen in the past. Despite widespread prosperity, living costs and income inequality in New York City are rising. Poverty and homelessness remain high. The city's core infrastructure—our roads, subways, sewers, and bridges—is aging. Affordable housing is in short supply. Our air and water have never been cleaner, but our parks and public spaces don't always serve the needs of all New Yorkers. And, without action, climate change is an existential threat to our future.

OneNYC is based on ideas coming from thousands of New Yorkers. We asked civic, community, and business leaders what they thought we should be doing. We heard from everyday New Yorkers—at town hall meetings and online, in polls and surveys—who told us about what works and what could be better in their lives, and what they imagine for New York's future. We worked with over 70 City agencies and offices and many regional partners. As we implement this plan, we will continue to engage with New Yorkers. We will seek their opinions and suggestions about how to make our city better.

We will fight for New York to retain and enhance its status as a global leader—in commerce, culture, trade, innovation, sustainability, climate resiliency, and more. We will ensure that New York will always be a place where people can realize their dreams on the world's biggest stage, as generations have done in the past, and that everyone has the opportunity to succeed.

The initiatives we announce today in OneNYC are far-reaching, but also realistic, and will prepare New York City for the challenges we face today and in the years ahead. By focusing our efforts on growth, equity, sustainability, and resiliency, we will ensure that the city's fifth century will be our strongest yet.